



California's Negligent Operator Treatment Program Evaluation System, 1976-1995

An Overview of Findings and Program Improvements

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PREFACE

This report represents a chronological review of an evaluation system which was initiated in the early 1970's and which was terminated at the end of 1994. Originally known as the Post Licensing Control Reporting and Evaluation System (PLCRES) and later as the Negligent Operator Treatment Evaluation System (NOTES), it produced a large number of evaluation reports over the period 1976-1995. In 1982, departmental research staff received the National Highway Traffic Safety Administration's *Award of Honor* in recognition of the contributions of PLCRES reports to evaluation research literature.

This document is primarily intended for non-technical audiences. Readers interested in referencing the reports for scientific purposes should obtain copies of the original reports, which provide a much more detailed and rigorous description of statistical methodology and findings.

The many individuals who contributed to the system are far too numerous to mention. In a few cases, however, the contributions warrant specific acknowledgement. Sandreno Marchi served as project administrator in developing the original system design. Dr. John Magistad, consulting statistician, and Dan Kadell played major roles in the original evaluation design and statistical methodology. Mr. Kadell was also the principal author of the first four reports produced by the system. The construction and implementation of PLCRES/NOTES required a huge investment of computer programming and EDP support. Don Zajic, Joe Chan, and Tom Mezzanares warrant specific mention in this regard. Finally, Terrance Keenan provided invaluable operational assistance and was responsible for developing much of the program cost information used in reports subsequent to 1983. Bill Howe was responsible for the original program costing model used during the initial phases of the project.

The present report is being issued as an internal technical monograph of the Department of Motor Vehicles' Research and Development Section rather than an official report of the State of California. The findings and opinions may therefore not represent the views and policies of the State of California.

During the period 1976-1995, the California Department of Motor Vehicles (DMV) published a series of annual and biennial reports on the effectiveness and benefit-costs of its negligent-operator (neg-op) treatment program. The evaluation system was terminated in November 1994, and the last report in the series was completed in June 1995. The purpose of this report is to summarize what was learned from the evaluation system and to document how the results were used to improve program effectiveness.

Section 12810.5a of the California Vehicle Code (CVC) defines a *prima facie* negligent operator as any Class C licensed driver "whose driving record shows a violation point count of four or more points in 12 months, six or more points in 24 months, or eight or more points in 36 months." Other sections of the CVC (§13800 and §14250) grant the department *discretionary authority* to take a variety of license control actions, including license suspension, against drivers who meet the vehicle code's *prima facie* definition of a negligent operator. The CVC (§13950) also requires that drivers be offered the opportunity for an administrative hearing pursuant to any actions proposed under the negligent-operator provisions. The point system for commercial drivers (Class A and B) is different than for Class C drivers (CVC §12810.5b) and is not described here because commercial drivers were excluded from the evaluation system beginning in 1989.

The establishment of an ongoing evaluation system emanated from annual reviews of the department's budget by the Department of Finance and Office of the Legislative Analyst, which questioned the effectiveness and cost benefits of DMV's negligent-operator interventions and other discretionary elements of the program. Among the reasons that the negligent-operator program has been subjected historically to intensive scrutiny is the considerable cost of conducting administrative hearings combined with the fact that the program is discretionary rather than statutorily mandated. As a result, the department has the discretion to increase the point count threshold where license control action is taken or to take no action at all. The fact that action is not mandated also provided some evaluation options that would not normally exist, such as the use of "untreated" control groups, as explained below.

Pre-1971 Program Structure and Evaluation Findings

The structure of the negligent-operator program underwent a variety of changes prior to 1971. Probably the most significant of these changes was the adoption of a group meeting in place of an individual hearing for most entry level *prima facie* negligent drivers. The more expensive individual hearing was reserved for drivers recidivating following the group meeting or for those quickly accumulating highly elevated point counts. This change was based on a small scale experimental study by Coppin (1961) showing that a group meeting was effective in reducing subsequent violations and was less costly than the individual hearing. A later study by Marsh (1970) led to the adoption of a more educationally formatted group meeting known as the Group Educational Meeting (GEM).

The negligent-operator program has for many years included a "pre-negligent" operator component in the form of an advisory letter warning violators of impending

license control actions for subsequent offenses. There is also a "terminal" action, in which drivers placed on probation following an individual hearing are suspended for violation of probation (V.C. 14252) if they continue to accumulate traffic convictions.

During the period 1949-1971, the various program components were subjected to a number of statistical evaluations, which varied greatly in scope and rigor. On the whole, the studies supplied convincing evidence that all components of the negligent-operator program were effective in reducing traffic convictions, but the results were more equivocal as to whether this effect translated into reduced accidents. With the exception of the study by Marsh (1970), none of the studies employed a formal cost-benefit analysis, in which program costs were compared to the economic or societal benefits of the observed accident reduction. Dissatisfaction with the amount and consistency of the demonstrable accident reductions, combined with various limitations in the research designs, ultimately led the legislative analyst to recommend that the negligent operator program be discontinued.

The Legislative Analyst's Program Review

The genesis of the evaluation system can only be understood in the context of the Office of the Legislative Analyst's 1970–1971 review of the department's budget, which contained the following recommendation:

"We recommend that the discretionary driver improvement program be discontinued, that the budget be reduced by \$4,047,601 and that man-year allocation be reduced by 405.2 man-years..., We have serious questions regarding the effectiveness of the entire driver improvement program, particularly the discretionary portion. We question whether enough of the driving population obtain enough benefit from the programs to warrant an expenditure at this level."

During the formal legislative budget process, the Legislature actually eliminated the program from the budget and then restored it during a hearing of the Joint Legislative Budget Committee. The program was restored on the condition that the department develop an ongoing reporting and evaluation system to provide the legislative analyst and Legislature with annual effectiveness reports. This requirement was contained in budget language approved by the Joint Legislative Budget Committee of the 1970–71 legislative session.

The Initial System Design

The department developed the initial evaluation system design through a grant from the California Office of Traffic Safety (OTS). Originally known as the "Post Licensing Control Reporting and Evaluation System (PLCRES)," the system was designed to address four objectives, as described in the original OTS grant:

1. Measure the risk potential (i.e., accident involvement rate) of each driver group acted upon (target groups) by each DMV post licensing control sub-activity (action type).

2. Provide data on an annual, semi-annual, or quarterly basis regarding the effectiveness of each of DMV's post licensing control sub-activities.
3. Allow management to determine whether some activities become less effective over time so that corrective intervention can be instigated.
4. Provide the parameter values (program effects) necessary for incorporation into system optimization and cost-benefit models.

The technical requirements to achieve these objectives were assessed by departmental research staff and an outside statistical consultant and subsequently outlined in a scientific journal paper entitled, "Toward a Dynamic System of Driver Improvement Program Evaluation" (Peck, 1976). A schematic of the final evaluation design is shown in Figure 1, and the principles outlined in the above-referenced paper are summarized below. It was argued that an optimum evaluation system should have the following attributes:

1. Employ random assignment to treatments.
2. Utilize untreated control groups to provide statistical baselines.
3. Require extremely large sample sizes for adequate statistical power.
4. Incorporate cost-benefit analyses, or other utility decision models, into program evaluation designs.
5. Produce results which are relevant to the operational environment in which the programs are embedded.
6. Allow for continuous programmatic replication and the generation of computerized evaluation reports.

The evaluation system which ultimately resulted from the OTS grant was limited to the negligent-driver component of the department's post-licensing control program, whereas the original intent was to develop an evaluation system for all components of the program, including mandatory actions and discretionary actions for medical causes. The management decision to exclude mandatory and medical actions emanated from the inability or undesirability of establishing control groups for actions that are mandated by statute or for those based on medical grounds. A less rigorous quasi-experimental approach, which did not require control groups, was presented in a 1974 progress report to the legislature (Marchi, 1974), but it was subsequently decided that the information produced by the system would be too equivocal to justify the substantial cost of the required computer programming and staff support. The inability to obtain additional OTS grant funds to support the developmental effort was also a factor in this decision.

The most innovative feature of the implemented system was the use of a randomized experimental design involving control groups in the context of an ongoing operational system. The function of control groups is to provide baselines for estimating the number of subsequent accidents and convictions a group would have accumulated in the absence of being treated. Without this information, it is not possible to determine whether any reductions in the subsequent accident or conviction rates of the treated groups are attributable to (caused by) the program intervention. Although the temporary withholding of actions from the control group temporarily exposes those drivers to increased risk if the driver control actions were, in fact, effective, the procedure can be defended on several grounds (Campbell, 1970; Cook & Campbell, 1979). Probably the most important of these relate to the criticality of determining whether or not a given program is effective—e.g., does a given license control intervention or driver improvement program *cause* a reduction in the subsequent accident and conviction rate of those drivers who are targeted by the program? The ability to answer this question correctly and precisely can prevent two types of decision errors: (1) eliminating a program that is truly effective, or (2) continuing a program that is actually ineffective. The consequence of the first error is a potential reduction in public safety, whereas the second type of error results in an inefficient allocation of resources.

Although these concepts may appear rather academic when presented in the abstract, the circumstances which gave rise to the genesis of the evaluation system indicated that policy makers (e.g., legislators) were not convinced of the program's effectiveness and made a provisional decision to eliminate the program in absence of compelling evidence to the contrary. Thus, the potential for an error of the first type was more than an abstract possibility, and any increase in accidents among the small percentage of offenders assigned to the control group was considered a far smaller risk than depriving all drivers of the possible safety benefits of the negligent-operator program. The importance of this controversy cannot be overemphasized since disagreement over the effectiveness of a program or treatment regimen is one of the factors which provides ethical and scientific justification for the use of control groups (Cook & Campbell, 1979). As shown later in this report, the information supplied by the evaluation system led to the retention of the negligent operator program and precipitated improvements which substantially increased the number of accidents prevented over the 20-year period monitored by the evaluation system.

The Report Series

The final report pursuant to the original OTS grant was published in August, 1976, followed by a series of annual and biennial reports to the legislative analyst. The report titles and dates are listed below:

1. Post Licensing Control Reporting and Evaluation System: Negligent Operator Program Effectiveness. Periodic Status Report. No. 1, October 1976.

2. Post Licensing Control Reporting and Evaluation System: Negligent Operator Program Costs and Effectiveness. Periodic Status Report. No. 2, March 1977.
3. Post Licensing Control Reporting and Evaluation System: Negligent Operator Program Costs and Effectiveness. Periodic Status Report. No. 3, March 1978.
4. Post Licensing Control Reporting and Evaluation System: Negligent Operator Program Costs and Effectiveness. Periodic Status Report. No. 4, February 1979.
5. Post Licensing Control Reporting and Evaluation System: Negligent Operator Program Costs and Effectiveness. Periodic Status Report. No. 5, April 1980.
6. Post Licensing Control Reporting and Evaluation System: Negligent Operator Program Costs and Effectiveness. Periodic Status Report. No. 6, December 1980.
7. Post Licensing Control Reporting and Evaluation System: Negligent Operator Program Costs and Effectiveness. Periodic Status Report. No. 7, (Summary) December 1981.
8. Negligent Operator Treatment Evaluation System: Progress Report. March 1985.
9. Negligent-Operator Treatment Evaluation System: Program Effectiveness Report #1. December 1985.
10. Negligent Operator Treatment Evaluation System: Program Effectiveness Report #2. December 1986.
11. Negligent Operator Treatment Evaluation System: Program Effectiveness Report #3. December 1987.
12. Negligent Operator Treatment Evaluation System: Program Effectiveness Report #4 (Detailed findings). December 1988.
13. Negligent Operator Treatment Evaluation System: Program Effectiveness Report #5 (Detailed findings). December 1990.
14. Negligent Operator Treatment Evaluation System: Program Effectiveness Report #6 (Detailed findings). December 1992.
15. Negligent Operator Treatment Evaluation System: Program Effectiveness Report #7 (Summary of findings). June 1995.

It should be noted that the title of the evaluation system changed after 1981 from PLCRES to Negligent Operator Treatment Evaluation System (NOTES). The factors giving rise to the change are addressed below.

The Findings

Each report in the series summarized the magnitude and statistical significance of any reductions in subsequent accidents and citations which were attributable to the interventions. A summary of the reported effect sizes is shown in Figures 2-9. A number of observations and conclusions can be made from a review of the information in these figures and from the benefit-cost analyses contained in the above reports.

1. All components of the program had a significant effect in reducing the rate of subsequent traffic citations throughout the 20-year period covered. In general, the size of the citation reduction increased with the intensity of the intervention, with warning letters producing the smallest effect and probation violator suspensions producing the largest reductions.
2. Taken as a whole, the evidence indicates that all components of the program probably reduced the subsequent rate of accidents. However, the magnitude of the effects was smaller and less consistent than with citations, particularly those involving warning letters, which in some instances did not reach conventional levels of statistical significance, or which only became significant when combining warning letter 1 and 2 (in the case of NOTES) or the results from different cohorts (in the case of PLCRES).
3. The total number of accidents prevented is closely related to the volume of drivers treated. As the number of driver interventions increases, so does the number of accidents prevented (see Figure 10).
4. The negligent-operator program is highly cost-beneficial in that the economic value of the accidents prevented far exceeds the cost of the program. Somewhat paradoxically, the most cost-beneficial component (warning letters) is the least effective in terms of accidents prevented per treatment. This is because warning letters are extremely inexpensive and are applied to large volumes of drivers. Thus, apparently trivial effects on accidents become highly cost-effective when these net dollar benefits are multiplied by very large volumes.
5. The effectiveness of PLCRES declined over time, particularly the GEM component (Level 3). The revised program structure of the Negligent-Operator Treatment System (NOTS) produced markedly better results.
6. During the period of 1976-1994, it is estimated that the post-license control interventions prevented 30,000 accidents (see Table 1).
7. The number of accidents prevented by the program peaked at close to 3,000 accidents prevented in 1986, and declined to 1,600 in 1994. The decline is largely attributable to reductions in the volume of drivers treated. Among the factors contributing to this decline are reductions in overall traffic enforcement, as evidenced by declines in the number of traffic violation convictions reported by the courts between 1991-1994.

Benefits of the Evaluation System: Policy Changes and Improvements

One of the primary purposes of the evaluation system was to identify any reductions in program effectiveness so that corrective actions or alterations in policy could be initiated. During the 20-year period of the evaluation system, a number of recommendations were made for improving system effectiveness. Before presenting a comprehensive listing of implemented recommendations, there is need to address in some detail the most significant changes resulting from the evaluation system. As noted above, there was evidence of declining effectiveness following PLCRES Status Report #4, particularly with respect to the Level 3 (group educational meeting) treatment. During this period, the department also experimented with alternatives to the Level 4 individual hearing with mixed results (Garretson & Sherman, 1979). The department therefore recommended that the system be revamped, and a committee was formed to restructure the program. The new program was outlined in a 1981 report to the State Legislature (Division of Driver Licenses, 1981). A comparison of the PLCRES and the new NOTS program structure is summarized below:

<u>Point level (one year)</u>	<u>PLCRES</u>	<u>NOTS</u>
1		
2		soft warning letter
3	soft warning letter	hard letter (notice of intent to suspend)
4	group educational meeting	probation / suspension hearing*
5	individual probation hearing (usually probations)	probation violator suspension (revocation
6+	probation violator hearing	after 4th violation of probation)

*This initially consisted of a brief "group-meeting" followed by any individual hearings for each subject. The group component was discarded in 1988.

The new system was designed to achieve greater reduction by:

- 1) Intervening at a lower point count.
- 2) Increasing the volume of drivers targeted by some form of intervention.
- 3) Increasing the use of license suspension at both the hearing and probation violator level.
- 4) Establishing a formula for determining the length of license suspension for violation of probation and limiting the scope of any requested administrative hearing. Suspensions were implemented by mail and a hearing granted only upon demand rather than being automatically scheduled.

As stated in the 1981 report to the legislature, the objective of the changes was "to achieve a greater degree of accident reduction with no increase in program cost." It is therefore appropriate to determine whether the department delivered on its promise.

Just a casual inspection of the attached figures and Table 1 indicates dramatic improvements in program impact following implementation of NOTS in 1983. Both the volume of drivers impacted and number of accidents prevented increased dramatically. Although not shown in these figures, program cost did not increase beyond the rate of inflation over the period covered by NOTES. A comparison of the pre-NOTS program effectiveness results with those shown for the last NOTES report for which program costs were available (Marsh, 1992) establishes the following:

- NOTS intervened against more drivers annually (611,000 versus 181,000)
- NOTS prevented more accidents per year (2,800 versus 640)
- NOTS was much more cost effective in terms of cost per accident prevented (\$750 versus \$2,170)

Table 1
Number of Accidents Prevented by Driver Control
Interventions Under PLCRES and NOTES

Time period	Number prevented	Potential lost due to control group
1976-1980 (PLCRES) ^a	5,700	400
1985-1994 (NOTES) ^b	24,300	1,100
Total	30,000	1,500

^aThe total number of accidents prevented for PLCRES and NOTES was estimated by averaging the annual number of accidents prevented calculated in each report and multiplying the result by the number of years the respective program was in place (e.g., 1,140 accidents prevented annually by PLCRES x 5 years = 5,700 accidents prevented overall and 2,430 accidents prevented annually by NOTES x 10 years = 24,300 accidents prevented overall).

^bIt is estimated that only 11,400 accidents would have been prevented if NOTES had not replaced PLCRES; benefits attributed to the NOTES alternative = 24,300 - 11,400 = 12,900 additional accidents prevented.

It is a fairly straightforward procedure to compute the additional number of accidents prevented over the duration of NOTES by comparing the total accidents prevented with the number expected had the program not been restructured. As shown in Table 1, it is estimated that the restructuring resulted in an additional 12,900 accidents being prevented over the period 1985-1994. In other words, we estimate that the targeted population would have been involved in 12,900 additional accidents had the old program not been replaced by the new system.

One objection to the continued use of control groups is that withholding treatments from the control subjects temporarily exposed them to increased accident risks. It is therefore appropriate to consider whether the information and benefits derived from

this strategy were sufficient to offset this risk. Table 1 presents an estimate of the increased number of accidents among control group members attributable to the temporary withholding of driver control interventions. During the 20-year course of the evaluation system, we estimate that failure to deliver the indicated interventions to control group subjects resulted in 1,500 accidents. In response, two points need to be made.

1. Had the negligent-driver program been eliminated due to lack of compelling proof of its continued effectiveness, there would have been 30,000 additional accident occurrences during the period, 1976-94.
2. Had the restructuring precipitated by the PLCRES evaluation results not occurred, there would have been 12,900 additional accidents during the period 1985-94.

It is very evident from the above two examples alone that the information produced by the evaluation system led to program improvements and public safety benefits far greater than any risk attributable to the use of control groups.

Other Changes. During the 20 year period of the evaluation system, a number of other changes were implemented. Some of these changes were based on data supplied by the evaluation system, whereas others relate to program changes emanating from other sources and considerations. In the former case, the evaluation system both precipitated and subsequently monitored the impact of a change, whereas in the latter case, the value of the evaluation system resided in providing policy makers with information on the impact of the changes resulting from external sources.

Tables 2 and 3 present a detailed summary of program changes and report recommendations described in the various NOTES reports. The most significant of these are listed below:

- Increased use of license suspension at Levels 3 and 4
- Deletion of the group component of the NOTS Level 3 hearing
- Reintroduction of the second warning letter (notice of intent to suspend)
- Elimination of the strategy of using different treatment approaches at Level 3 for drivers with DUI-related incidents
- Support for the continuation of the change to a phone hearing format at Level 3
- Current recommendation to discontinue assigning negligent operator point counts to convictions for driving with a suspended or revoked license (CVC 14601)
- Current recommendation to return to the policy of using distinctively different letters for Level 1 and Level 2

Plans for the Future

The management decision to discontinue the use of ongoing "hands-off" control groups has several far reaching implications on the department's ability to evaluate the effectiveness and cost-benefits of negligent-driver interventions. Clearly, it will not be possible to provide ongoing rigorous evidence of program effectiveness. This, in and

of itself, might not be a critical limitation if the program were to remain unchanged and one were willing to generalize evidence from prior evaluations to future program performance. However, it is clear from the past that the program is very dynamic and undergoes constant change. There is no reason to believe that this past history is not a prophecy of the future and that the program structure will not continue to change. The elimination of NOTES would appear to preclude rigorous assessment of the impact of such changes on subsequent negligent-driver treatment performance.

Four alternatives are currently being considered:

- 1) Accept the above limitations and make program effectiveness decisions on intuitive and analytic grounds
- 2) Develop quasi-experimental alternatives to the use of randomized control groups
- 3) Confine use of untreated control groups to selective "one shot" studies and remove control conditions immediately upon any evidence of subsequent driver record entries
- 4) Utilize "minimum treatment" conditions as a proxy for pure control groups. For example, in evaluating the effects of the Level 3 hearing, one might create a randomized comparison group who are sent a warning letter or educational brochure. Similarly, if one wishes to evaluate the effect of lengthening a suspension from, say, 3 to 6 months, it might be possible to create groups of eligible drivers who are randomly assigned to the short and long suspension conditions.

During the next year, the department will evaluate the above options and adopt an appropriate course of action.

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Table 2
Summary of Report Recommendations

Program Recommendations	Date	Implementation Status	Evaluation Status of Recommendation
Return to the mandatory GEM format. The GEM was changed from a mandatory to a voluntary program in December 1977 and subsequently, effectiveness declined. A more strongly worded notice to appear was adopted in November 1979, and the attendance level improved somewhat, but not to the previous level attained with the mandatory format.	1980, July	Implemented	Evaluated in PLCRES #7
Develop a new post licensing control program (NOTES) to increase program effectiveness. This recommendation was based on a previous PLCRES status report that did not show favorable cost-benefit figures for some of the programs components.	1981, December	Implemented	Evaluated in NOTES #1 - #7
Consider eliminating the regular and alcohol Warning Letters (W/Ls) at Level 1 because they appear to have little impact on accidents and their effects on citations and DMV actions do not appear to be cost beneficial.	1986, December	Implemented	Evaluated in NOTES #3 and #4
Continue to use the regular and the alcohol Notice of Intent to Suspend.	1986, December 1988, December 1989, December	Implemented	Evaluated in NOTES #3 - #7
Modify the regular Probation Hearing (P/H) treatment in order to increase its effect on subsequent accidents, particularly injury and fatal accidents.	1986, December 1987, December 1988, December 1990, December	Implemented	Evaluated in NOTES #3 - #7
Consider discontinuing the alcohol P/H for drivers who do not meet the prima facie legal definition of neg-op because there is no evidence that using this treatment in the Level 3 alcohol subpopulation prevents accidents or convictions.	1986, December 1987, December 1988, December	Implemented	Evaluated in NOTES #5
Explore ways to incorporate the home instruction point reduction incentive (HI/PRI) treatment into the neg-op program. This approach was found to be effective in prior studies and is less costly than in-person treatments.	1986, December 1987, December 1988, December 1990, December	Not Implemented - The V.C. provision permitting the use of this approach sunsetted 1/1/91	
Alcohol treatments should be restricted to the subpopulations for which they were originally designed (e.g., DUI offenders) and not given to drivers convicted of non-alcohol related 2-point offenses (e.g., speed over 100 mph).	1986, December	Not Implemented	

Table 2 (cont.)
Summary of Report Recommendations

Program Recommendations	Date	Implementation Status	Evaluation Status of Recommendation
A departmental task force should be appointed to review recommendations and implementation plans and develop improvements in driver safety referee training, operating procedure manuals, action control criteria, and the driver control management information system.	1986, December	Partially Implemented	
Consider reinstating the Level 1 warning letter.	1987, December	Implemented	Evaluated in NOTES reports #5 - #7
Examine the criteria and process uses to initiate license suspension at level 3 to determine whether the appropriate drivers are being suspended, whether policy is being executed consistently, and whether the license suspensions are of sufficient length to achieve deterrence.	1990, December	Pending	Under Development
Undertake a thorough cost study to validate or revise the basic utilization ratios developed in 1984.	1990, December 1992, December	Not Implemented	
Request that the legislature reconsider the 1991 law change which raised the number of points assigned to convictions of driving while suspended (CVC §14601) or to adopt legislation dealing with the offenders through mandatory actions outside of the standard point system.	1995, June	Pending	
Consider returning to the original policy of having different letters at Levels 1 and 2, or at least making them visually distinctive from each other.	1995, June	Pending	
Use existing NOTES data to address management's questions concerning previous changes to the neg-op program (e.g., what were the effects of introducing the requirement for proof of insurance before suspended neg-ops could reinstate their licenses?).	1995, June	Pending	

Table 3
Summary of Changes to the Post Licensing Control Program 1977-1994

Program Changes	Date	Source
The GEM changed from a mandatory meeting (attendance required on threat of suspension) to a discretionary meeting (no license sanctions).	1977, December	Recommendations from a research study entitled "Educational Approaches to Driver Improvement" (Marsh, 1978)
Probation by Mail was implemented for "low risk offenders."	1979, July	Recommendations from a research study entitled "An Evaluation of Probation by Mail as an Alternative to Mandatory Hearing Attendance for Negligent Operators" (Sherman & Ratz, 1979).
Mandatory GEMs were reinstated following a decrease in effectiveness after the voluntary GEMs were implemented.	1980, July	Recommendation of Legislative Analyst
A new post licensing control program was developed to increase program effectiveness (NOTS).	1981, December	California Legislature and DMV Management
The provision that allowed drivers who drove 25,000 miles per year to accumulate two additional neg-op points before being legally classified as neg-op was removed. Concurrently, a similar provision was put in place for drivers with Class 1 and Class 2 licenses (authorized to drive heavy vehicles). That is, Class 1 and 2 drivers could accumulate two additional neg-op points before being legally classified as neg-ops.	1985, July	California law change
The group of offenses allocated two points was expanded to include additional offenses.	1986, January	California law change
The department stopped issuing warning letters at Level 1.	1987, May	Recommendation in the 1986 NOTES report
The notices of intent were revised to improve format and readability. The tone of the letters and notices was also changed to make them less formal.	1988, June	California law change and DMV Management
The department increased the use of license suspension and restriction for drivers who attend the regular Level 3 hearings. This replaced a policy in which probation was generally the only action in effect after a hearing.	1988, September	Based on the results of a pilot study conducted by the Division of Field Operations, the Governor and the Legislature approved a budget proposal which funded the change as recommended in the 1987 NOTES report.
The group portion of the Level 3 hearing was eliminated.	1988, September	In response to the earlier program change (see above) that increased the use of license suspensions and restrictions of Level 3 drivers.
The individual portion of the hearing was extended from an average of approximately 10 minutes to about 30 minutes.	1988, September	Same as above

Table 3 (cont.)

Summary of Changes to the Post Licensing Control Program 1977-1994

Program Changes	Date	Source
Commercial drivers were deleted from the evaluation system due to a change in the point count system. Also, passage of the federal CDL act raised questions about continued use of control groups with commercial drivers.	1989, January	Previous report findings and federal law change
The alcohol intervention at Level 3 was eliminated.	1989, May	DMV Management and report recommendations--the change was the result of a) questions about the legal authority for these actions and b) the failure of these interventions to display any evidence of positive effects on accidents or citations.
The department resumed sending Level 1 warning letters.	1989, September	New data obtained subsequent to the discouraging results published in the 1986 NOTES report led to a recommendation that the Level 1 program be restored.
All drivers who had their drivers licenses suspended by the neg-op program were required to file proof of their financial responsibility before they could have their licenses reinstated.	1989, July	California law change
The neg-op point value of vehicle code section 14601 (driving with a suspended or revoked license) was raised from 0 to 2 points.	1991, May	California law change (AB 37)
A telephone hearing format was adopted for levels 3 and 4.	1992, July	DMV Management

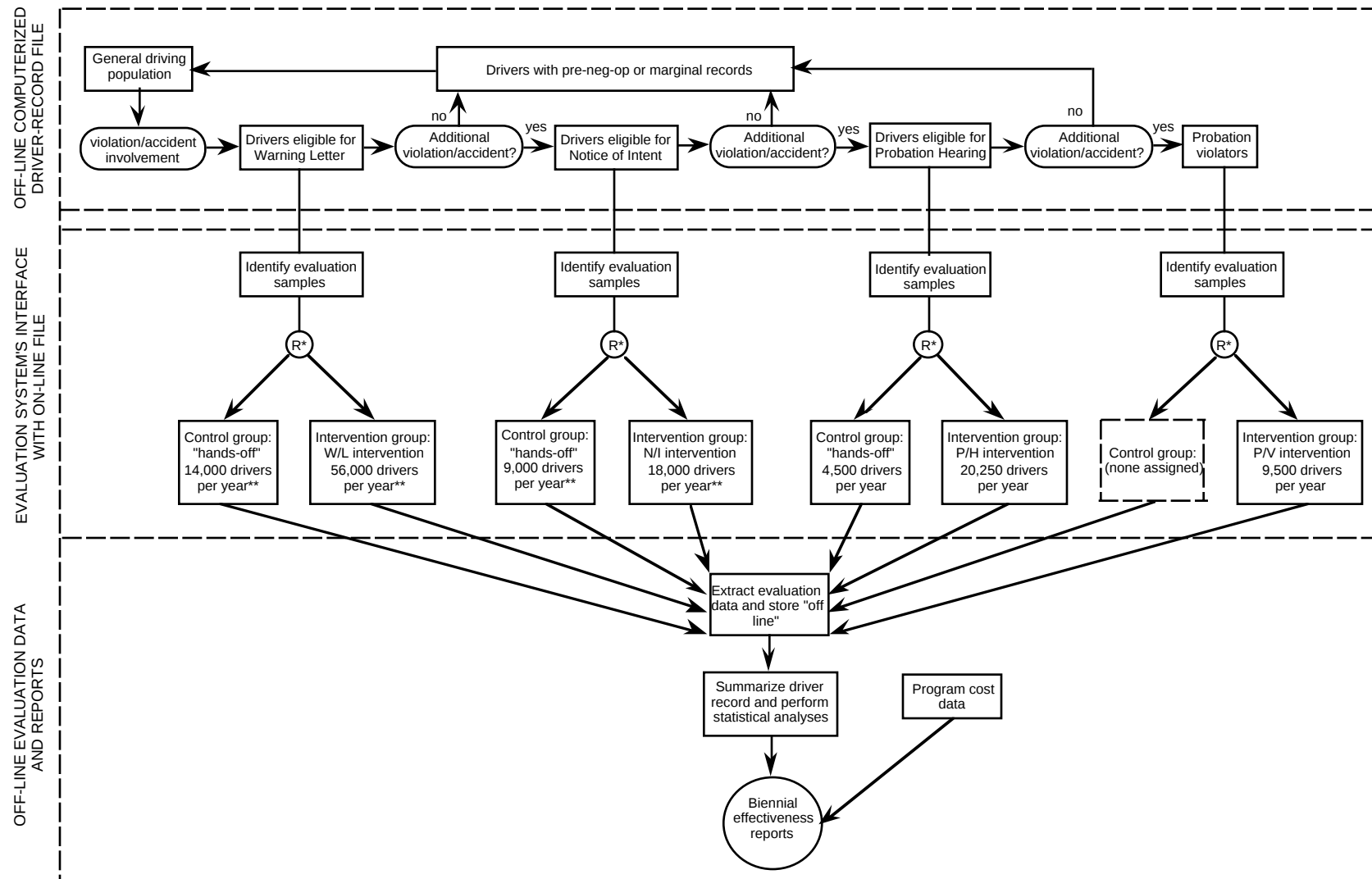


Figure 1. SCHEMATIC DIAGRAM OF THE NEGLIGENT-OPERATOR TREATMENT EVALUATION SYSTEM (NOTES)

Notes: R* Assignment based on computer-generated, random number.

**These groups contain drivers eligible for standard and alcohol interventions, and the type of intervention for which the driver is eligible is identified, so that the standard and alcohol interventions may be evaluated separately if a statistical test indicates that there are significant differences in effectiveness.

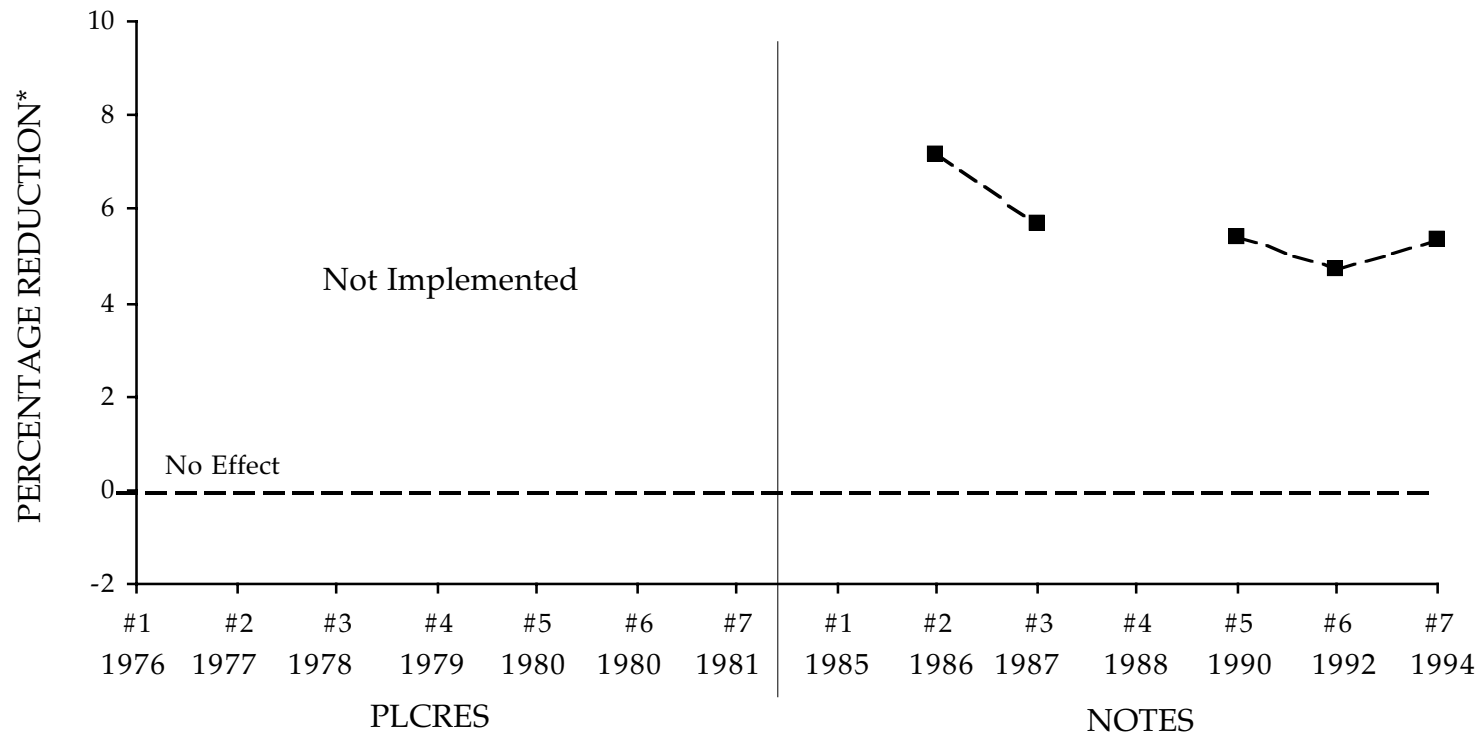


Figure 2. Percentage effect size* on subsequent citations—Level 1 treatment (NOTES: soft warning letter).

$$* \text{Percentage effect size} = \left(\frac{\bar{x}_{\text{control}} - \bar{x}_{\text{treatment}}}{\bar{x}_{\text{control}}} \times 100 \right)$$

- Level 1 was not used in PLCRES.
- Level 1 was not evaluated in NOTES #1 because sufficient data had not yet accumulated.
- Level 1 was not implemented during the time period covered by NOTES #4. The letter was reinstated and evaluated in NOTES #5.

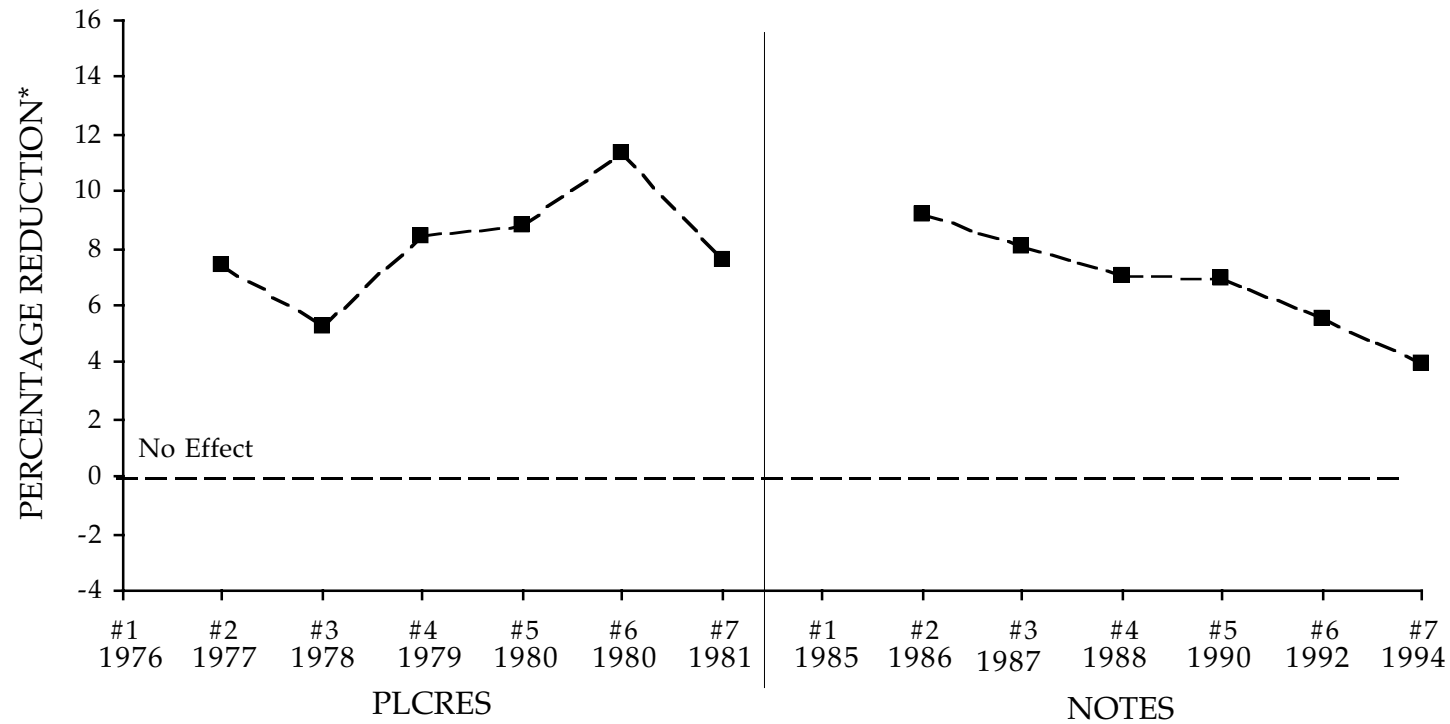


Figure 3. Percentage effect size* on subsequent citations—Level 2 treatment (PLCRES: soft warning letter and NOTES: letter of intent).

*Percentage effect size = $\left(\frac{\bar{x}_{\text{control}} - \bar{x}_{\text{treatment}}}{\bar{x}_{\text{control}}} \times 100 \right)$

- The Level 2 letter was not evaluated in PLCRES #1 or NOTES #1 because sufficient data had not yet accumulated.

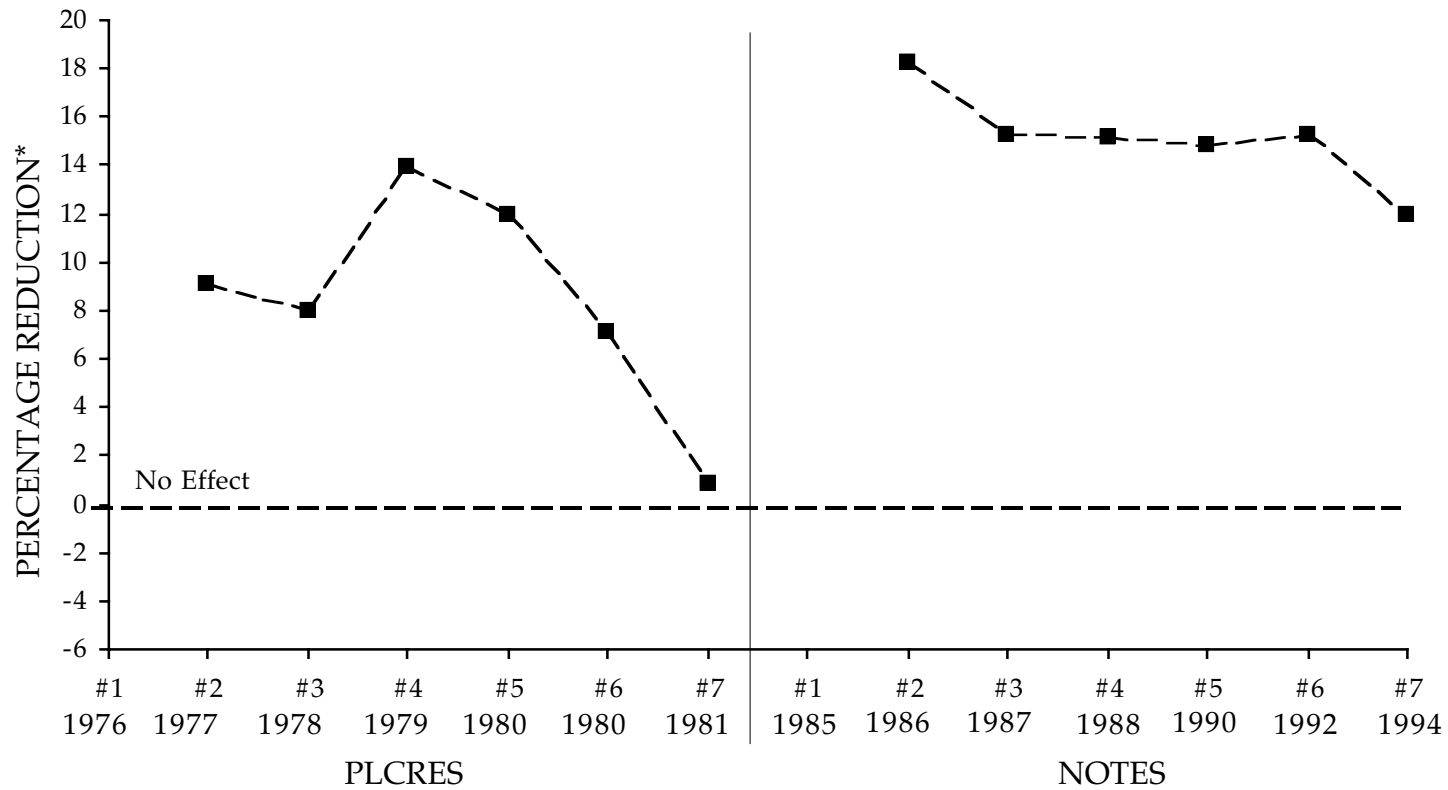


Figure 4. Percentage effect size* on subsequent citations—Level 3 treatment (PLCRES: group educational meeting and NOTES: probation/suspension hearing).

*Percentage effect size = $\left(\frac{\bar{x}_{\text{control}} - \bar{x}_{\text{treatment}}}{\bar{x}_{\text{control}}} \times 100 \right)$

- Level 3 was not evaluated in PLCRES #1 or NOTES #1 because sufficient data had not yet accumulated.

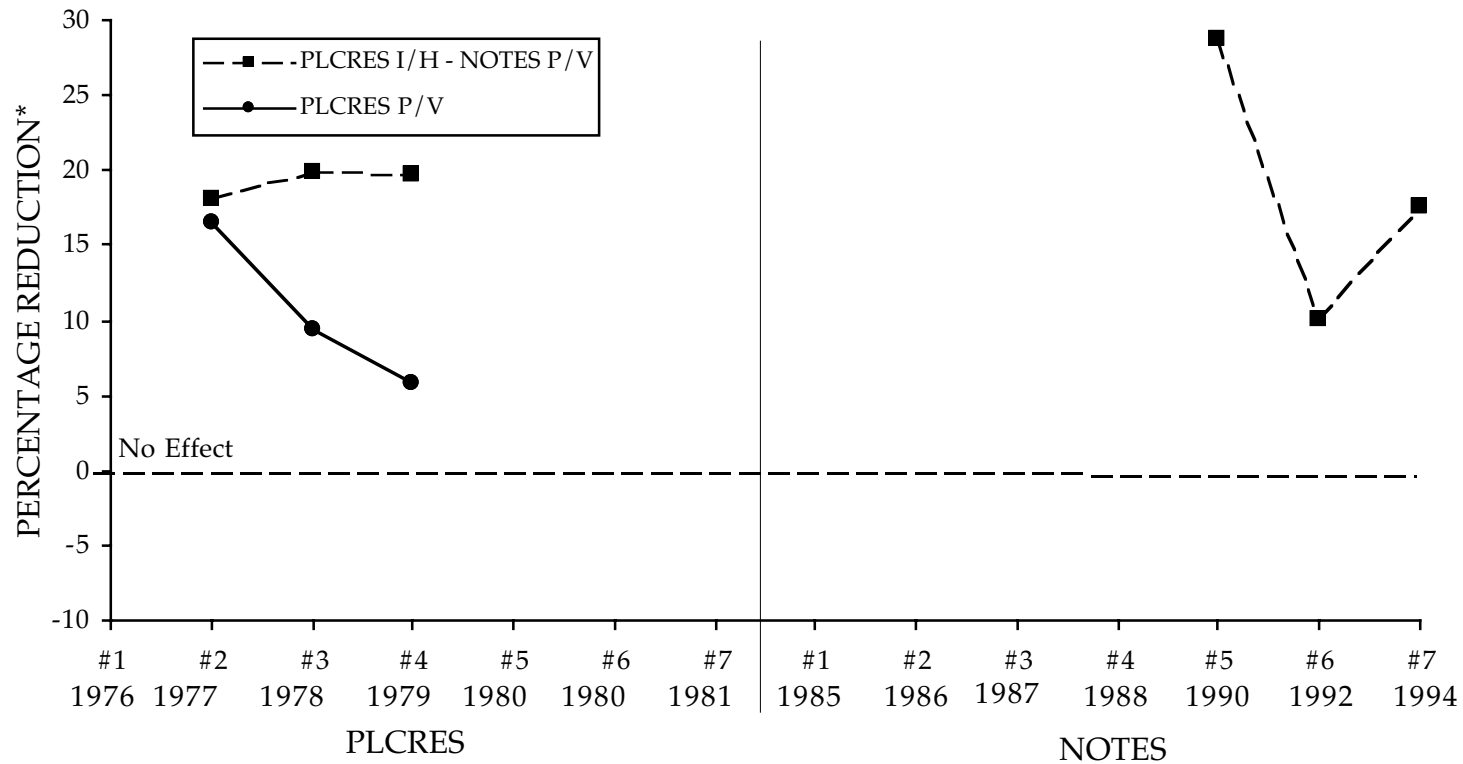


Figure 5. Percentage effect size* on subsequent citations—Levels 4 and 5 treatment (PLCRES: neg-op and probation violator hearing and NOTES: probation violator suspension).

*Percentage effect size = $\left(\frac{\bar{x}_{\text{control}} - \bar{x}_{\text{treatment}}}{\bar{x}_{\text{control}}} \times 100 \right)$

- PLCRES Levels 4 and 5 and NOTES Level 4 were not evaluated in PLCRES #1 and NOTES #1 - #4 because sufficient data had not yet accumulated or was not available due to the concurrent implementation of another probation violator study.
- Level 5 treatments were not administered after PLCRES #5.

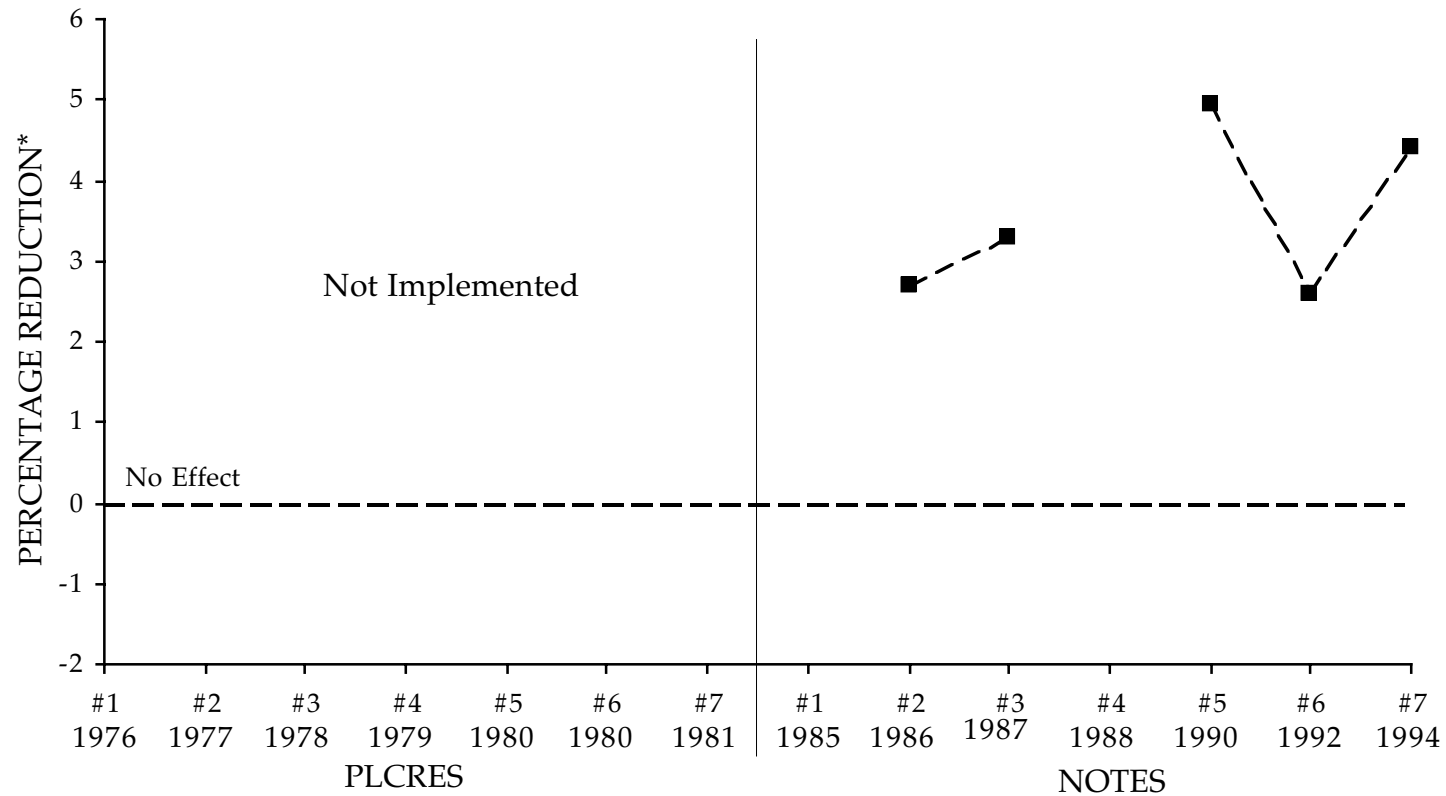


Figure 6. Percentage effect size* on subsequent accidents—Level 1 (NOTES soft warning letter).

* Percentage effect size = $\left(\frac{\bar{x}_{\text{control}} - \bar{x}_{\text{treatment}}}{\bar{x}_{\text{control}}} \times 100 \right)$

- Level 1 was not used in PLCRES.
- Level 1 was not evaluated in NOTES #1 because sufficient data had not yet accumulated.
- Level 1 was not implemented during the time period covered by NOTES #4. The letter was reinstated and evaluated in NOTES #5.

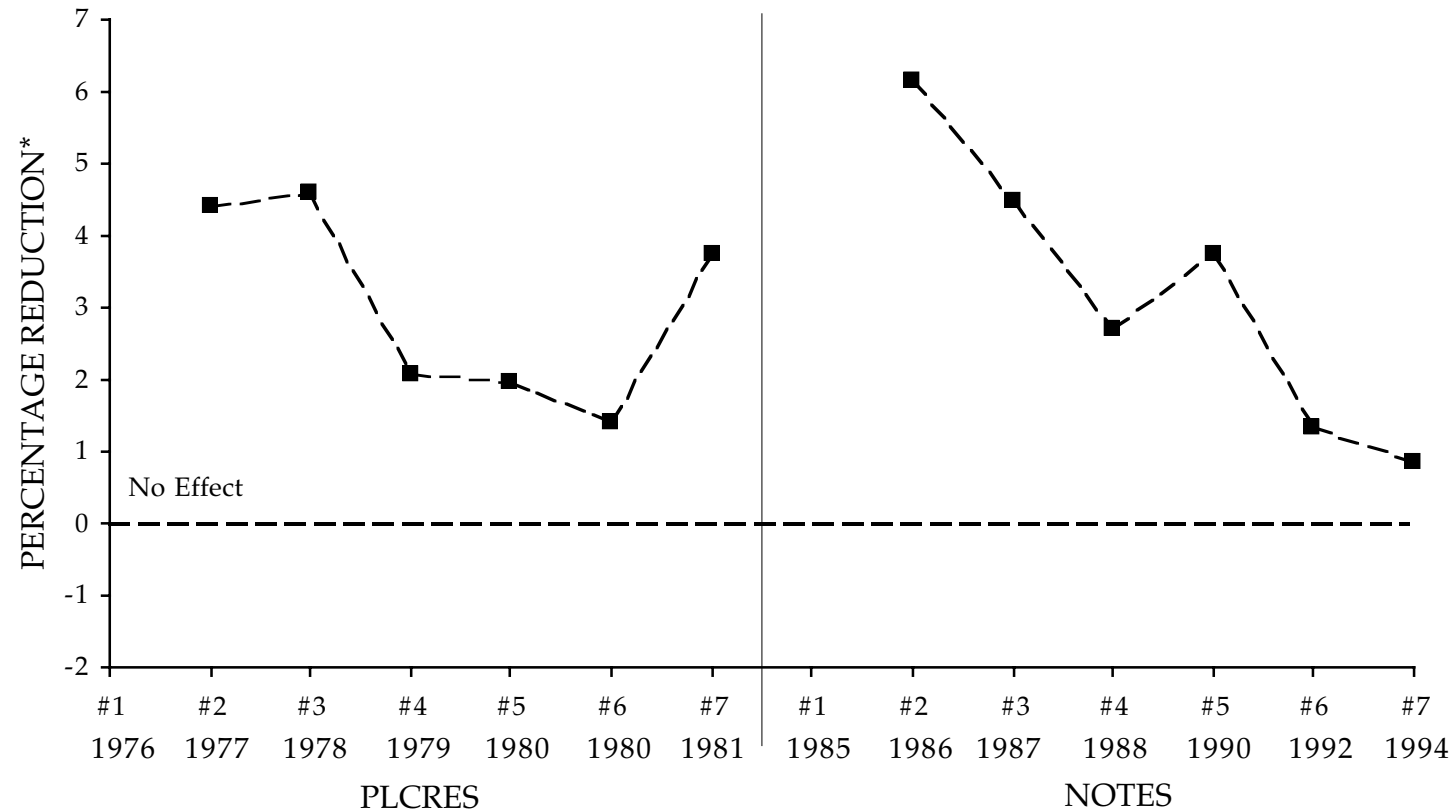


Figure 7. Percentage effect size* on subsequent accidents—Level 2 treatment (PLCRES: soft warning letter and NOTES: letter of intent).

* Percentage effect size = $\left(\frac{\bar{x}_{\text{control}} - \bar{x}_{\text{treatment}}}{\bar{x}_{\text{control}}} \times 100 \right)$

- The Level 2 letter was not evaluated in PLCRES #1 or NOTES #1 because sufficient data had not yet accumulated.

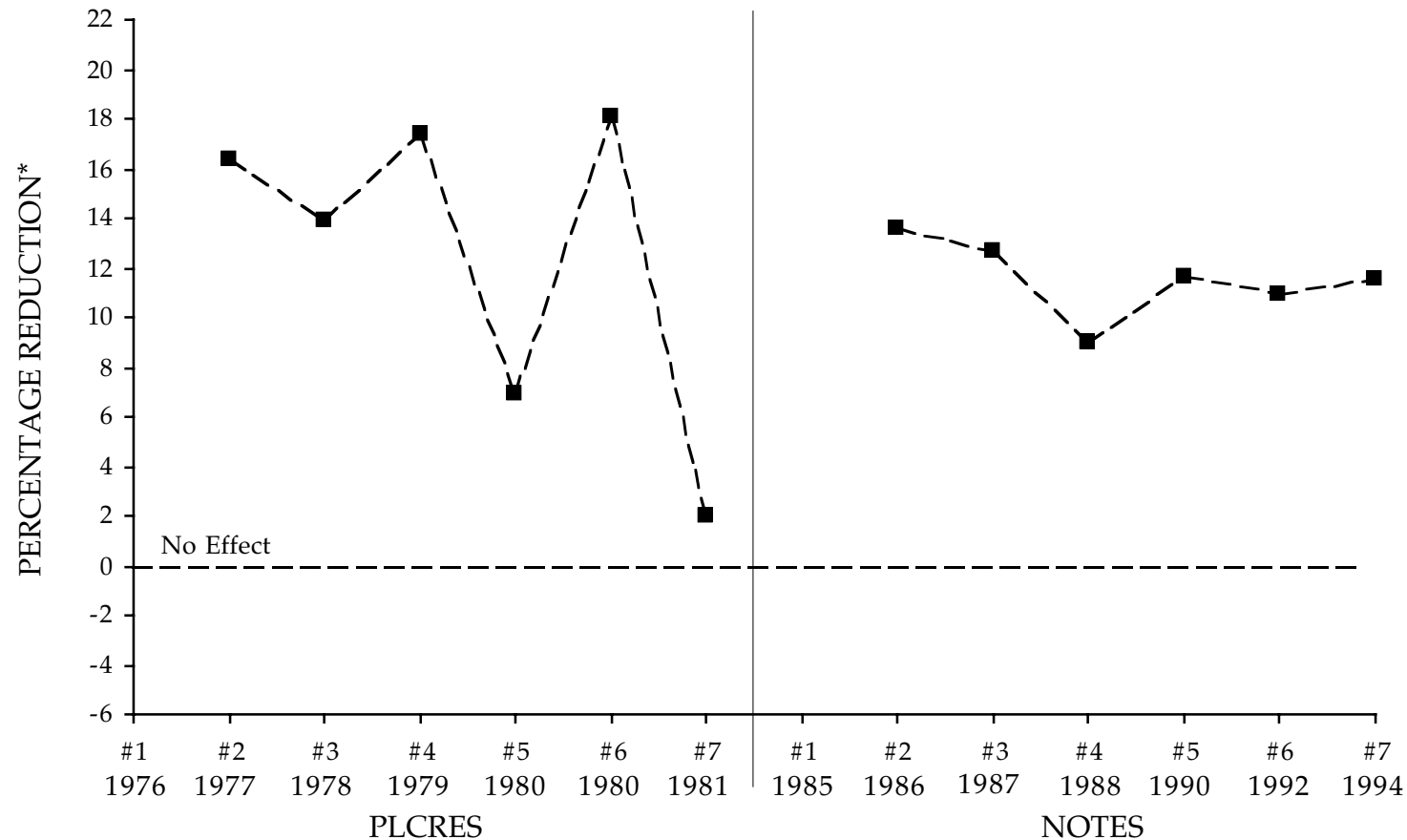


Figure 8. Percentage effect size * on subsequent accidents—Level 3 treatment (PLCRES: group educational meeting and NOTES: probation/suspension hearing).

*Percentage effect size = $\left(\frac{\bar{x}_{\text{control}} - \bar{x}_{\text{treatment}}}{\bar{x}_{\text{control}}} \times 100 \right)$

- Level 3 was not evaluated in PLCRES #1 or NOTES #1 because sufficient data had not yet accumulated.

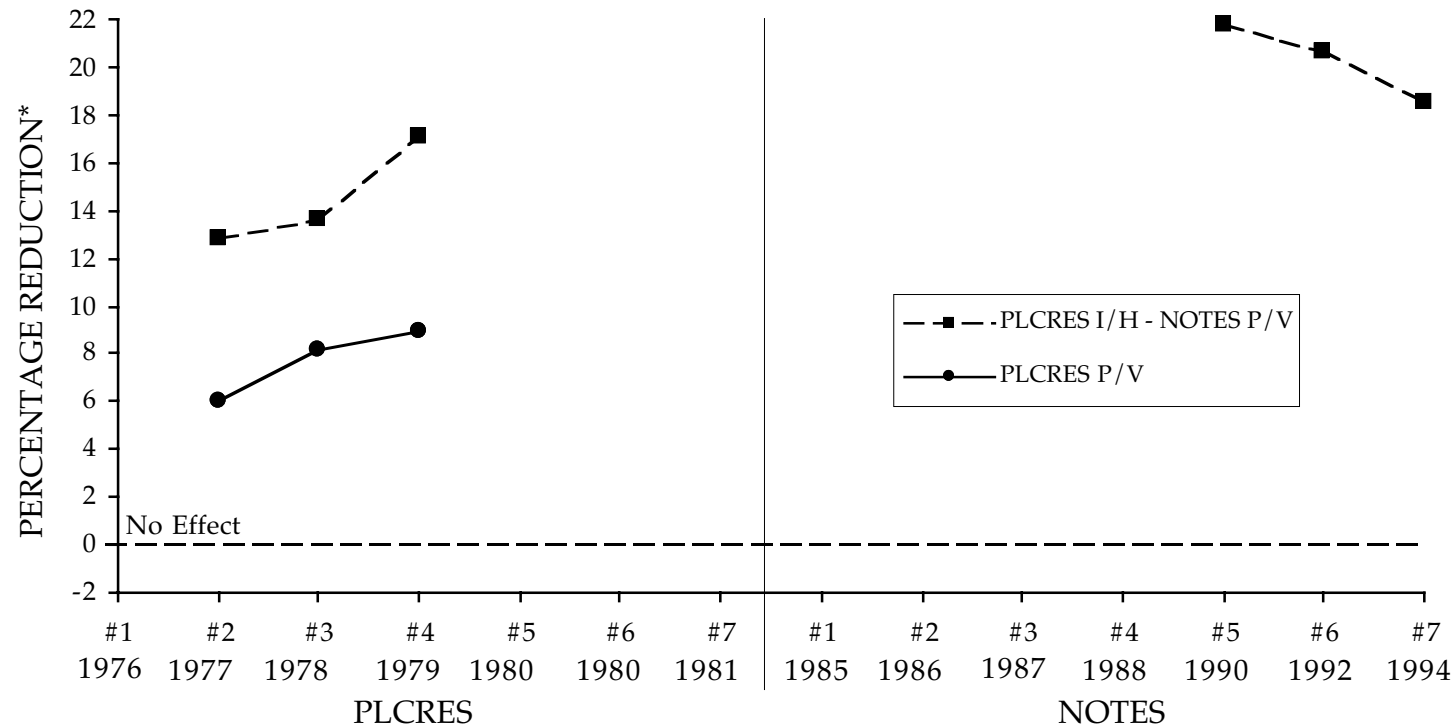


Figure 9. Percentage effect size* on subsequent accidents—Levels 4 and 5 treatment (PLCRES: neg-op and probation violator hearing and NOTES: probation violator suspension).

* Percentage effect size = $\left(\frac{\bar{x}_{\text{control}} - \bar{x}_{\text{treatment}}}{\bar{x}_{\text{control}}} \times 100 \right)$

- PLCRES Levels 4 and 5 and NOTES Level 4 were not evaluated in PLCRES #1 and NOTES #1 - #4 because sufficient data had not yet accumulated or was not available due to the concurrent implementation of another probation violator study.
- Level 5 treatments were not administered after PLCRES #5.

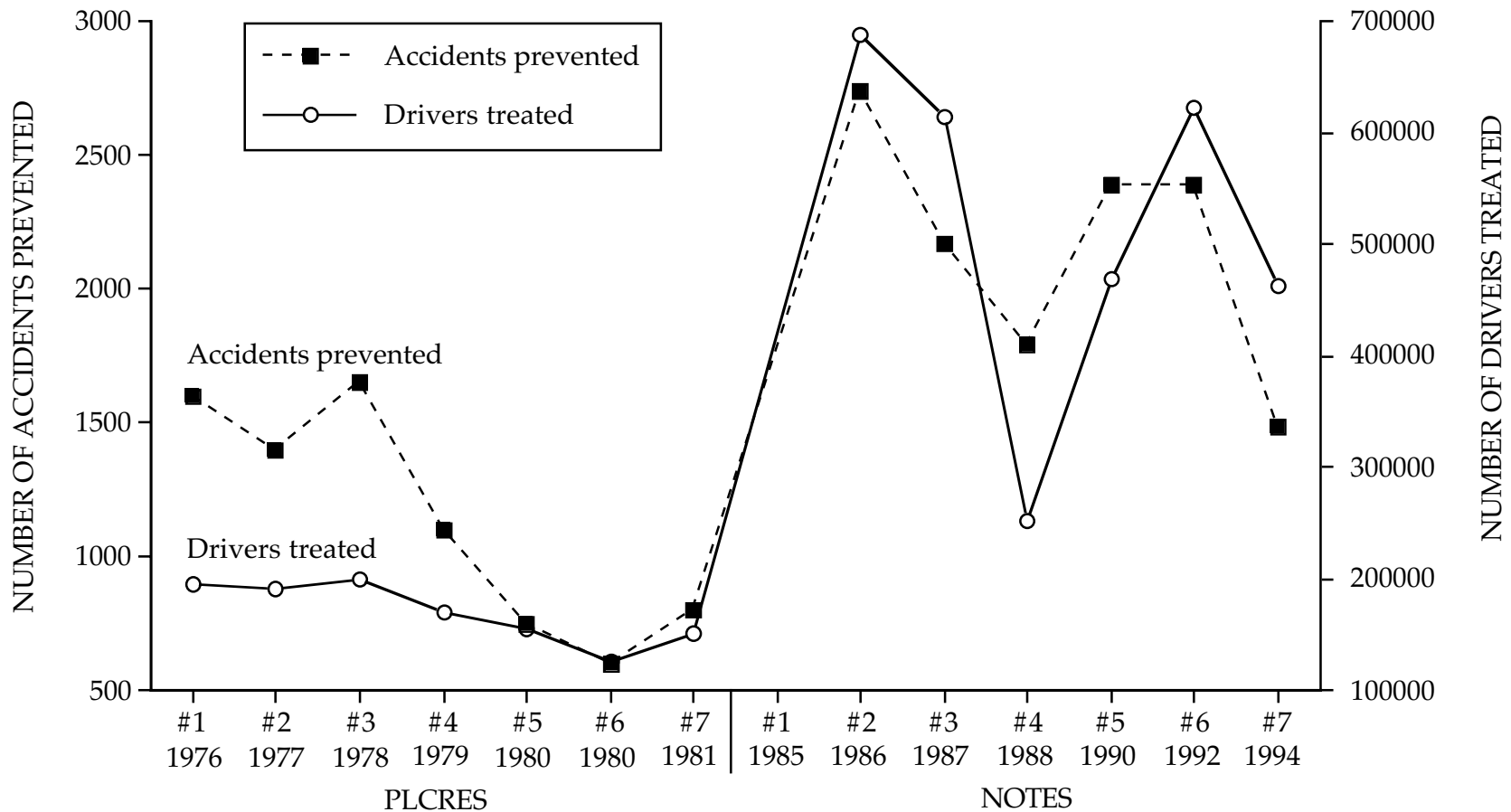


Figure 10. NOTS 1976-1994: Number of accidents prevented and number of drivers treated.

- A portion of the data used to calculate the number of accidents prevented was estimated for PLCRES reports #5 - #7. This was necessary because during these time periods the Individual Hearing and Probation Violator Hearing treatments were being evaluated and compared to another treatment in another study. This resulted in insufficient data to evaluate the treatments in PLCRES.