# Hawaii's Mandatory Seat Belt Law: Patterns of Enforcement

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Hawaii is known for having one of the highest seat belt use rates in the nation and for having an aggressive enforcement program. Data on seat belt citations, driver licenses, police-reported crashes, and observed seat belt use studies reveal the following: (*a*) cited drivers are more likely to be young and male, (*b*) there are spatial and temporal patterns associated with enforcement, (*c*) a higher proportion of out-of-state drivers are cited than are involved in traffic collisions, (*d*) most seat belt citations issued in Hawaii are stand-alone violations, (*e*) the most common type of other citation issued with a seat belt violation is for speeding, and (*f*) repeat offenders tend to be male and young. These findings may have relevance for other states considering stepped-up levels of enforcement. The results suggest a need for more scrutiny of the associations between seat belt use, enforcement, and crash involvement, perhaps over a long time period.

Hawaii was the tenth state in the nation to adopt a mandatory seat belt use law, which took effect on December 16, 1985. The law covers front-seat passengers and gives police the power of primary enforcement. The four police departments in the state have vigorously enforced the law. More than 150,000 citations have been issued since the law took effect (see Table 1). These enforcement efforts have contributed to Hawaii's high rate of compliance with the law. Hawaii has consistently led the United States in seat belt use. Recent surveys show a use rate among front-seat occupants of more than 85 percent. An earlier study demonstrated the strong correlation between seat belt use and enforcement levels in Hawaii (*1*). In this article patterns of enforcement in Hawaii, characteristics of motorists who violate the seat belt law, patterns of repeat offense, and relationships between seat belt violations and other traffic offenses are described.

## BACKGROUND

Over the years, various studies have examined the relationship between enforcement and seat belt use (*1–3*). Previous research also has examined the relationship between enforcement levels and the reduction of injuries or fatalities (*4,5*). These studies have helped to make enforcement of mandatory use laws a priority at the national and local levels. Enforcement has been adopted because of its effectiveness and relative ease of implementation. Seat belt use campaigns that attempt appeal to motorists' intellect (e.g., "seat belts save lives" or "seat belt citations will cost you dollars") are less effective than citing those people violating the law. With most public education and media efforts, it is often difficult to determine whether the targeted audience has been reached. This study examines the nature and pattern of enforcement in Hawaii, a state with an aggressive enforcement program.

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A deeper understanding of the seat belt citation data provides feedback about who violates the seat belt law, at least in terms of data administered by the judicial system. Given these findings, what sort of new strategies and programs, including improved enforcement, are justified? This study, combined with other data, helps in understanding some of the differences between the people who do not use seat belts and those who are cited.

Using citation data has several advantages over using observational data on seat belt use. Citation data provide more accurate information on age, gender, place of residence, and other personal characteristics than observational data. Moreover, some uncertainties associated with observing and recording seat belt use are reduced. Police officers apprehending violators and writing tickets are more reliable than the best trained observers. The observational studies in Hawaii, for example, involved posting graduate students who conducted surveys of moving and stopped traffic at fixed locations throughout the state. Approximately 3,000 observations were made per study period. The citation data base contains a similar number of records for most years. Citation data are also more accurate than telephone or mail surveys, which ask respondents to report whether they use restraints, because actual behavior is observed. Research in Hawaii has demonstrated that there are significant differences between observed and self-reported behavior (*6*).

At the same time, citation data may reflect enforcement instead of actual patterns of seat belt use. Police may be more inclined to stop and cite certain motorists than others. Many factors affect enforcement, which is but one of numerous duties that police officers must carry out. There is a need to examine the overall relationships between seat belt enforcement, traffic enforcement, and general law enforcement activities.

Circumstances in Hawaii offer advantages for this type of investigation. Measuring the impacts of an intervention such as the mandatory seat belt law is easier in an island state, isolated from other jurisdictions. There are only four counties and four police departments in the entire state corresponding to the major inhabited islands (Oahu, Maui, Hawaii, and Kauai). As such, it is also feasible to establish uniform enforcement programs and to make necessary changes in the enforcement regime. The data on citations, licensing, and crashes are centralized. Because the enforcement levels are so high, enforcement is more even than in other more fragmented jurisdictions. The lessons learned in Hawaii are transferable to other states interested in increasing enforcement activities.

## DATA AND METHODS

In this study, data from different sources were compiled. The State of Hawaii Judiciary, which is responsible for administering records on traffic violations, provided a data tape with all seat belt citations

**TABLE 1 Number of Citations Issued per Year—1985 to 1991***

| YEAR | CITATIONS |
|---|---|
| 1985** | 219 |
| 1986 | 16,607 |
| 1987 | 24,587 |
| 1988 | 31,773 |
| 1989 | 34,625 |
| 1990 | 32,277 |
| 1991 | 19,437 |
| TOTAL | 159,525 |

*partial year --1/1/91 to 6/30/91
**month of December only for 1985

Source: Dept. of Transportation; State of Hawaii.

for a 12-month period. The city and county of Honolulu, Department of Data Systems, provided data on licensed drivers in the state. The State Department of Transportation provided data on motor vehicle crashes. In addition, data on observed seat belt use collected by the University of Hawaii, Department of Urban and Regional Planning, were also incorporated in this investigation. The analysis was performed on a dedicated Sun Sparc 10 workstation using SAS (version 6.09). Following a summary of the key findings, some of the implications of the results for Hawaii and other places interested in increasing enforcement levels are discussed.

## FINDINGS

The results of this study answer the following questions: (*a*) Who is cited for violation of the seat belt law? (*b*) When are most citations issued? (*c*) What other citations are issued with seat belt violations? (*d*) What are the characteristics of repeat offenders?

### Who is Cited for Violation?

Table 1 shows that more than 159,000 persons have been cited for violating the seat belt law in Hawaii since it became mandatory. Between 1986 and 1990, the full years for which there are data, the average number of citations issued per year was 27,973, or an average of 76.6 citations per day. Actual enforcement levels per day over a 12-month period beginning in 1990 varied from a few days when there were ten or fewer citations to some days when more than 350 citations were issued. This enforcement effort needs to be viewed also in terms of the state's geography and patterns of development. In terms of land area, Hawaii is the fourth smallest in the nation. With just over 4,000 mi of roads, it has the smallest amount of roadway of all states. Moreover, development has concentrated in certain key nodes, such as Waikiki, along the southern coast of most islands in a linear pattern, making it easier for police to establish a strong presence, compared with urban areas that are more sprawling.

**TABLE 2 Citations by County***

| COUNTY | NUMBER OF CITATIONS | PERCENT | NUMBER LICENSED | PERCENT LICENSED DRIVERS CITED BY COUNTY |
|---|---|---|---|---|
| HONOLULU | 18,457 | 50.24% | 537,127 | 3.44% |
| MAUI | 7,617 | 20.73% | 76,638 | 1.31% |
| HAWAII | 5,642 | 15.36% | 89,471 | 6.31% |
| KAUAI | 5,025 | 13.68% | 39,718 | 12.65% |
| STATE TOTAL | 36,741 | 100.00% | 742,954 | 4.95% |

Frequency missing of cited driver = 3
* 7/1/90 to 6/30/91

Source: Judiciary; State of Hawaii and Dept. of Data System; City and County of Honolulu.

**TABLE 3 Seat Belt Citations by Age Group***

| AGE | NUMBER OF CITATIONS | PERCENT | NUMBER OF DRIVERS | CITATIONS PER AGE GROUP |
|---|---|---|---|---|
| 15-18 | 2,666 | 7.38% | 40,788 | 6.54% |
| 19-25 | 9,035 | 25.01% | 118,659 | 7.61% |
| 26-35 | 10,832 | 29.98% | 206,971 | 5.23% |
| 36-55 | 10,392 | 28.76% | 279,549 | 3.72% |
| 56-64 | 1,749 | 4.84% | 70,185 | 2.49% |
| 65+ | 1,457 | 4.03% | 78,329 | 1.86% |

| | CITATION | DRIVERS LICENSE |
|---|---|---|
| MEAN | 34.71 | 39.87 |
| MEDIAN | 31.00 | 36.00 |
| MODE | 21.00 | 29.00 |
| STD. DEV. | 13.73 | 16.06 |

*7/1/90 to 6/30/91

Source: Judiciary; State of Hawaii and Dept. of Data Systems; Systems; City and County of Honolulu.

As Table 2 indicates, more than half of the seat belt citations are issued in Honolulu, the largest county in the state. More than three-quarters of the state's total population resides in this county. It is the most urbanized of the four counties. However, a higher proportion of the drivers have been cited in the counties of Kauai and Hawaii, also known as the Big Island.

Table 3 shows seat belt citations by various age categories. When grouped according to age cohorts, in terms of absolute numbers of citations, those in the 26 to 35 year old age group received the most citations. The number of citations decreased for the older age groups. However, in terms of the percentage of licensed drivers cited for seat belt violations, a different picture emerged. More than 7.6 percent of the 19 to 25 year olds and 6.54 percent of the 15 to 18 year olds received citations in a 12-month period, but less than 2 percent of those 65 and older were cited. This table also shows that the mean age for seat belt citations was 34.7 years and the mode was 21 years. The mean age of all registered drivers, however, was 39.87 and the modal age was 29.

Table 4 shows that proportionately more males than females were cited for seat belt violations. Approximately 72.3 percent of those cited were males; 27.6 percent were females. According to license data, 54.7 percent of drivers were male. Although more than 6 percent of the male drivers were cited for violation of the seat belt law, only 2.8 percent of all female drivers received citations.

Approximately one-fifth of the citations issued in Hawaii were to people with out-of-state licenses. This is not surprising, given the large number of tourists and military in Hawaii. In 1990, more than 6 million tourists came to Hawaii. Table 5 shows the home state of those with out-of-state licenses cited for seat belt violations in Hawaii. California drivers led all states outside of Hawaii. Because

**TABLE 4 Seat Belt Citations by Gender***

| SEX | NUMBER OF CITATIONS | PERCENT | REGISTERED DRIVERS | PERCENT | PERCENT OF REGISTERED DRIVERS CITED BY SEX |
|---|---|---|---|---|---|
| MALE | 26,030 | 72.32% | 423,094 | 54.67% | 6.15% |
| FEMALE | 9,960 | 27.68% | 350,846 | 45.33% | 2.84% |
| TOTAL | 35,990 | 100.00% | 773,940 | 100.00% | 4.65% |

Frequency missing of cited drivers = 754
* 7/1/90 to 6/30/91

Source: Judiciary; State of Hawaii and Dept. of Data Systems; City and County of Honolulu.

**TABLE 5 States with Highest Number of Citations Issued in Hawaii***

| STATE | CITATION | PERCENT |
|---|---|---|
| HAWAII | 29,356 | 81.05% |
| CALIFORNIA | 2,525 | 6.97% |
| WASHINGTON | 388 | 0.83% |
| TEXAS | 302 | 0.83% |
| ILLINOIS | 265 | 0.73% |
| FLORIDA | 248 | 0.68% |
| NEW YORK | 213 | 0.59% |
| COLORADO | 189 | 0.52% |
| OREGON | 167 | 0.46% |
| ARIZONA | 160 | 0.44% |
| TOTAL | 33,813 | 93.36% |

* 7/1/90 to 6/30/91

Source: Judiciary; State of Hawaii and Dept. of Data Systems; City and County of Honolulu.

**TABLE 6 Frequency of Citations by Day of Week***

| WEEKDAY | NUMBER | PERCENT |
|---|---|---|
| MONDAY | 5,029 | 13.69% |
| TUESDAY | 5,545 | 15.09% |
| WEDNESDAY | 6,050 | 16.47% |
| THURSDAY | 5,816 | 15.83% |
| FRIDAY | 5,913 | 16.09% |
| SATURDAY | 4,890 | 13.31% |
| SUNDAY | 3,501 | 9.53% |
| TOTAL | 36,744 | 100.00% |

* 7/1/90 TO 6/30/90

Source: Judiciary; State of Hawaii.

**TABLE 7 Frequency of Citations by Month***

| MONTH | NUMBER | PERCENT |
|---|---|---|
| JULY | 3,772 | 10.27% |
| AUGUST | 5,511 | 15.00% |
| SEPTEMBER | 2,923 | 7.96% |
| OCTOBER | 2,033 | 5.53% |
| NOVEMBER | 1,662 | 4.52% |
| DECEMBER | 1,668 | 4.54% |
| JANUARY | 2,480 | 6.75% |
| FEBRUARY | 3,740 | 10.18% |
| MARCH | 3,562 | 9.69% |
| APRIL | 3,529 | 9.60% |
| MAY | 3,155 | 8.59% |
| JUNE | 2,709 | 7.37% |
| TOTAL | 36,744 | 100.00% |

* 7/1/90 to 6/30/91

Source: Judiciary; State of Hawaii and Dept. of Data Systems; City and County of Honolulu.

**TABLE 8 Other Violation Issued***

| TYPE OF CITATION ISSUED | NUMBER | PERCENT |
|---|---|---|
| SEAT BELT - NO OTHER VIOLATION | 29,974 | 88.96% |
| SEAL BELT W/ SPEEDING | 3,201 | 9.50% |
| SEAL BELT W/EQUIPMENT VIOLATION | 261 | 0.77% |
| SEAL BELT W/DUI/DRUG | 237 | 0.70% |
| SEAL BELT W/RECKLESS/INATTENTION | 19 | 0.00% |

* 7/1/90 to 6/30/91

Source: Judiciary; State of Hawaii.

of the large proportion of visitors from California and the large number of people who migrate from the West Coast, these results are not surprising.

### When Are Most Citations Issued?

Table 6 shows that Wednesdays, Fridays, and Thursdays were the days with the most citations. The fewest citations were issued on Sundays, followed by Saturdays. The finding that weekends tended to be lower than weekdays suggests that some groups that drive more on weekends, such as youth or recreational drivers, may be at a lower risk of being cited.

Table 7 shows that the highest number of citations occurred in August, and the lowest occurred in November and December. The high citation rate in August correlates with a number of enforcement campaigns. Other seasonal factors that may correlate with the number of citations issued include peak tourist months, which occur in spring and summer.

### What Other Citations are Issued with Seat Belt Citations?

Table 8 shows that approximately 89 percent of the seat belt citations were stand-alone violations. This is an important finding for states considering adoption of a primary enforcement law. Most seat belt violators were not in violation of any other traffic law. Primary enforcement enables police to target nonusers more effectively. A surprisingly small proportion (less than 1 percent) of the seat belt violators had equipment violations or were driving under the influence of alcohol or drugs. Motorists cited for noncompliance were more likely to be cited for speeding than for any other violation. Almost 10 percent of those who received a seat belt citation also received a speeding ticket.

### What are the Characteristics of Repeat Offenders?

Statistics were compiled on repeat offenders during the period 1990 to 1991 by matching driver's license numbers. A total of 1,970 persons had more than one citation in 1 year (Table 9). Most of these repeat offenders, 89 percent, had two citations. Approximately 8.7 percent had three citations and 2.4 percent had four or more citations in 1 year. The mean age for repeat offenders (31.0 years) was lower than the mean age for all violators (34.7 years). The modal age for repeat offenders was 19, compared with 21 for the total population of those cited.

A higher proportion of the repeat offenders were male, 78 percent, compared with 21 percent who were female (Table 10). Males made up a slightly higher percentage of the population in the repeat offender category than in the general population of seat belt law violators (Table 4, 72 percent).

## DISCUSSION

A summary of the key findings can be found in Table 11. It displays similarities between drivers cited for violation of the seat belt law and drivers who are involved in crashes. Age is a key characteristic

**TABLE 9 Citations Received by Same Driver—1990 to 1991**

| NUMBER OF CITATIONS | NUMBER OF DRIVERS | PERCENT |
|---|---|---|
| 1 | 26,607 | 93.49% |
| 2 | 1,644 | 5.78% |
| 3 | 165 | 0.58% |
| 4 | 37 | 0.01% |
| 5 | 7 | 0.00% |
| 6 | 1 | 0.00% |

Source: Judiciary; State of Hawaii.

**TABLE 10 Gender of Repeat Offenders***

| SEX | NUMBER OF DRIVERS | PERCENT |
|---|---|---|
| MALE | 1,437 | 78.87% |
| FEMALE | 385 | 21.13% |
| TOTAL | 1,822 | 100.00% |

* 7/1/90 to 6/30/91

Source: Judiciary; State of Hawaii.

**TABLE 11 Summary of Results, 1990**

| | LICENSED DRIVERS | CITED DRIVERS | CRASH INVOLVED DRIVERS | SEAT BELT USE RATE |
|---|---|---|---|---|
| MEAN DRIVER AGE | 39.87 yrs | 34.71 yrs | 35.57 yrs | UNAVAIL. |
| STD. DEV. OF AGE | 16.06 yrs | 13.73 yrs | 15.25 yrs | UNAVAIL. |
| % MALE | 54.67% | 72.32% | 65.50% | UNAVAIL. |
| % MALE AGES 18 - 25 YRS. | 16.50% | 20.07% | 16.78% | UNAVAIL. |
| % URBAN (HONOLULU CNTY) | 72.30% | 50.00% | 75.60% | 84.20% |
| RURAL (ALL OTHER COUNTIES) | 27.70% | 50.00% | 24.40% | 78.82% |
| % OUT OF STATE DRIVERS | NA | 18.87% | 13.64 | NA |
| % ALCOHOL RELATED | NA | 0.70% | 2.55% | NA |
| % SPEEDING | NA | 9.50% | 5.75% | NA |
| % INJURED OR KILLED | NA | NA | 20.83% | NA |
| SEAT BELT USE RATE OF DRIVERS | NA | NA | UNAVAIL. | 82.60% |

Source: Judiciary; State of Hawaii, Dept. of Data Systems; City and County of Honolulu, Dept. of Transportation; State of Hawaii and University of Hawaii's Seat Belt Observational Studies.

in common. The average age of those cited is 34.7 years, which is very close to the mean age of drivers in the involved crash population, 35.5. Another similarity is the percentage distribution of males ages 18 to 25 who appear in the citation data base and crash file. Younger male drivers make up a large proportion of the population in both of these files. A smaller proportion of out-of-state drivers are involved in crashes than are cited for violation of the seat belt law. Two important differences noted in Table 11 are the differences between the citation population and the crash population when speed and alcohol were factors. Although these factors have been found to be significant when associated with crashes, their frequencies in both files are rather small.

This investigation indicates that enforcement of the seat belt law in Hawaii is related to certain driver characteristics (age, sex, state of license, etc.), spatial (urbanization, size of county, etc.), and temporal (time, day, month) factors. Hawaii has managed to implement an extensive enforcement program. Assuming that 80 percent of Hawaii's drivers are in compliance with the law, then approximately 20 percent, or 135,525 drivers, are potential violators. Given that more than 150,000 citations have been issued since enactment of the law and only a small percentage have gone to the same driver, one can begin to comprehend the magnitude of Hawaii's enforcement efforts. Although the effects are diluted by Hawaii's large tourist population, evident in that 20 percent of those cited have out-of-state licenses, clearly Hawaii's lasting rate of compliance is because of its strong enforcement efforts. More research is needed to determine whether the 80 percent level of compliance represents a saturated effect, or whether higher levels can be achieved. Future research will focus on the remaining 20 percent of nonusers to determine more about the underlying motivation of these individuals and on a deeper understanding of what sort of policies can be instituted, at what expense, to change their behavior.

Those cited for violation of the seat belt law tend to be male, young, and driving in more urbanized areas of the state. The mean age of those cited for violation of the seat belt law is much lower than the mean age of all drivers, but very close to the mean age of the crash-involved driver population. On the other hand, a disproportionately large number of males are cited for violation of the seat belt law, in comparison to their numbers in the general driver population and in terms of their representation in crashes.

Although out-of-state drivers make up only 13.6 percent of the drivers involved in collision in Hawaii, they make up almost 19 percent of those cited. These results can be attributed to the comparatively lower use rates among drivers in other states and the effectiveness of enforcement efforts in Hawaii.

The relationship between seat belt citations and other traffic violations showed that almost 90 percent of the seat belt citations given in Hawaii were stand-alone citations. This is an important finding for places considering the adoption of primary enforcement laws and for those interested in the relationship between different types of traffic violations. Speeding tickets were given in over 9 percent of the cases, but citations for driving under the influence of alcohol were issued in less than 1 percent of the cases. In examining patterns of repeat offense, it was found that the typical repeat offender tended to be male and younger than the general population of those cited for violation of Hawaii's mandatory use law.

This largely descriptive investigation calls for further analysis. More sophisticated modeling techniques might produce predictions about personal characteristics or other factors. Moreover, additional analysis of the behaviors and motivations of persistent seat belt law violators in a state with such a strong enforcement program is needed. Future investigations might consider targeting these repeat violators for more detailed scrutiny.

## REFERENCES

1. Kim, K. E. Effects of Enforcement on Seat Belt Use in Hawaii. In *Transportation Research Record 1325*. TRB, National Research Council, Washington, D.C., 1991, pp. 51–56.
2. Shinar, D., and A. J. Mcknight. The Effects of Enforcement and Public Information on Compliance. In *Human Behavior and Traffic Safety*, (L. Evans and R. Schwing, eds.), Plenum Press, New York, 1985.
3. Campbell, B. J. *The Relationship of Seat Belt Law Enforcement to Level of Belt Use*. University of North Carolina Highway Safety Research Center Report HSRC-TR72. Chapel Hill, June 1987.
4. Evans, L., and J. Graham. *Risk Compensation and Safety Belt Laws*. Working Paper 88-35. Department of Economics, University of Maryland, College Park.
5. Wagenar, A. C., R. G. Maybee, and K. P. Sullivan. Mandatory Evaluation of Seat Belt Use in Eight States: A Time Series Evaluation. *Journal of Safety Research*, Vol. 19, pp. 51–70.
6. Kim, K. E. Differences Between Self-Reported and Observed Use of Child Safety Seats in Hawaii. *Transportation Quarterly*. Vol. 46, No. 1, 1992, pp. 115–121.

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