

Abridgement

Public Attitude Toward the Seattle Area HOV System and Effectiveness of the HERO Hotline Program

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The development and use of high-occupancy vehicle (HOV) facilities have provided a cost-effective way to increase the efficiency of existing transportation networks with relatively few environmental, social, or environmental and social impacts. A positive public attitude toward these facilities is critical to both their effectiveness and the political viability of the facilities. Therefore, it is imperative for transportation agencies that rely on HOV facilities to be aware of the attitudes of the public toward these facilities. These agencies must know the desires of the population at large and determine appropriate education and marketing programs. In 1988 the Washington State Department of Transportation began research on HOV compliance. Two primary objectives of the project were (a) to determine the public's attitudes toward both the HERO hotline program (to report HOV violations) and the HOV system through a survey, and (b) to analyze the effectiveness of the HERO program. The public attitude survey that was conducted, the results of that survey, and the implications the survey results have on the effectiveness of the HERO program are described in this paper. Conclusions and recommendations are also presented.

A positive attitude of the public toward high-occupancy vehicle (HOV) facilities is critical not only to HOV effectiveness, but to their political viability as well. Transportation agencies that promote the use of HOV facilities must be aware of the public's attitudes toward these facilities. They must know the desires of the population at large and they must determine appropriate education and marketing programs.

One factor that contributes to the public's confidence in and attitude toward HOV facilities is the violation rate. Enforcement is usually expensive and disruptive to the traffic stream. In addition, on facilities without adequate enforcement areas, HOV regulations may be very difficult to enforce. In a 1984 cooperative venture with the Municipality of Metropolitan Seattle (Seattle Metro) and the Washington State Patrol, the Washington State Department of Transportation (WSDOT) developed a public telephone hotline (HERO) for reporting HOV facility violators in the Seattle area to address these enforcement concerns. The objective of the program was to develop innovative and low-cost enforcement techniques. A study done at that time showed that the HERO hotline reduced violation rates on the region's HOV facilities

by 33 percent (1); however, WSDOT did not survey the public to determine its acceptance of the program. Since the initial evaluation of the program was completed in 1985 no follow-up evaluation has been performed.

In 1988 WSDOT started a research project to assess HOV compliance. Two of the primary objectives of project were to

- Determine the public's attitudes toward both the HERO program and the HOV system through a survey, and
- Analyze the effectiveness of the HERO program.

The public attitude survey that was conducted as part of the research project, the results of that survey, and the implications the survey results have on the effectiveness of the HERO program are discussed in this paper. Conclusions and recommendations are also presented.

PUBLIC AWARENESS SURVEY RESULTS

Residents of areas served by HOV lanes in Seattle were surveyed to determine

- How aware the public is of the HOV lane and HERO hotline programs,
- Whether the public feels the programs are successful, and
- Whether the public agrees with the concept of each program.

The HOV System

Questions in the survey were designed to establish the frequency of HOV lane use, the use of the lanes by mode, and the public's attitude toward HOV lanes.

Use by Mode

Almost 85 percent (84.5 percent) of the sample had traveled in an HOV lane at least once. The most frequently used mode was carpool (77 percent). The second most common mode choice was the bus, which was used by only 22 percent of those surveyed (Figure 1).

An interesting fact reported by the survey respondents was that 10 percent of the sample used an HOV lane at least once

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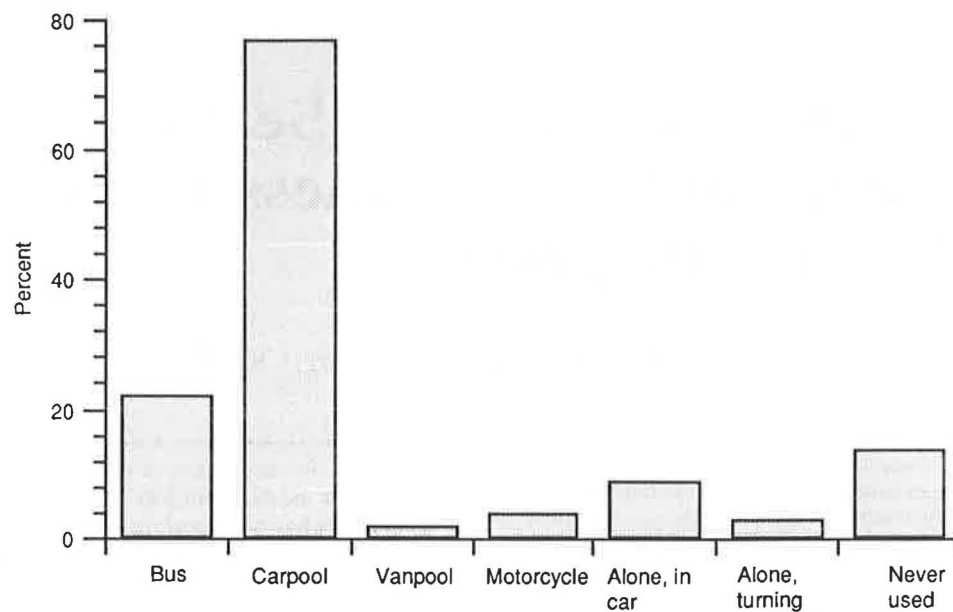


FIGURE 1 Use of HOV lane by mode.

while traveling alone in a car. However, when respondents were asked to choose the one mode they used most frequently while traveling in an HOV lane, only 4.4 percent admitted they usually used HOV lanes while alone in a vehicle.

Frequency of Use

When people who said they had used the HOV lanes at least once in the past were asked how often they used the lane, the most commonly selected answer was "less than once a month" (38.4 percent). Only 13.6 percent of these respondents said they used the lanes between 3 and 5 days a week. (Figure 2).

These results differed slightly by mode choice (Figure 3). Thirty-one percent of the bus riders stated they used HOV lanes between 3 and 5 days a week, whereas only 11 percent of the persons in carpools used HOV lanes that frequently.

The pattern of answers indicated that while most people had used HOV lanes at least once, the majority of people traveled on the lanes infrequently, and relatively few people used the lanes daily.

Attitudes Toward HOV Lanes

A number of questions were designed to assess the respondents' attitudes toward the HOV system. The results were encouraging. Asked whether they thought having carpool lanes in the Seattle area was a good idea, 84.6 of the respondents said "yes" (Figure 4). Another 4.5 percent stated that the lanes were a good idea, but qualified their answers with statements such as "only if the lane restrictions are enforced," or "if the lanes are for buses only." Only 9.1 percent of those surveyed responded to the question with a "no." This pattern did not differ significantly by area of residence or by travel

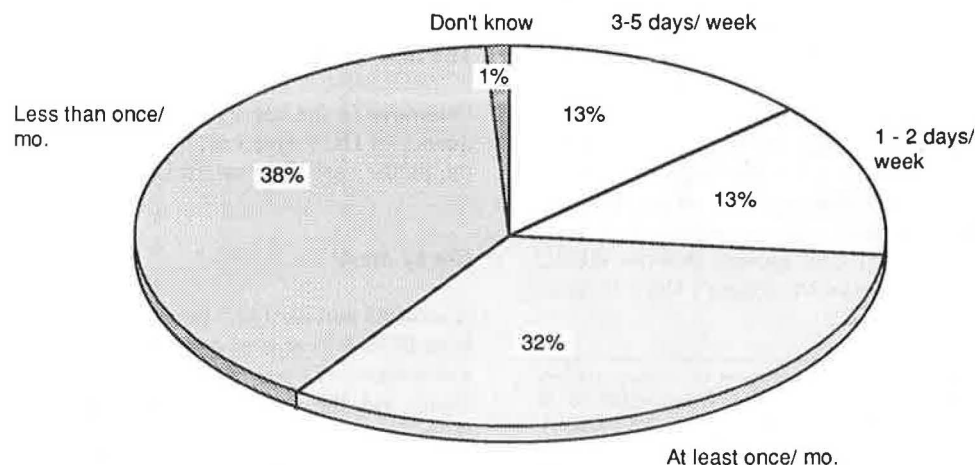


FIGURE 2 Frequency of HOV lane use.

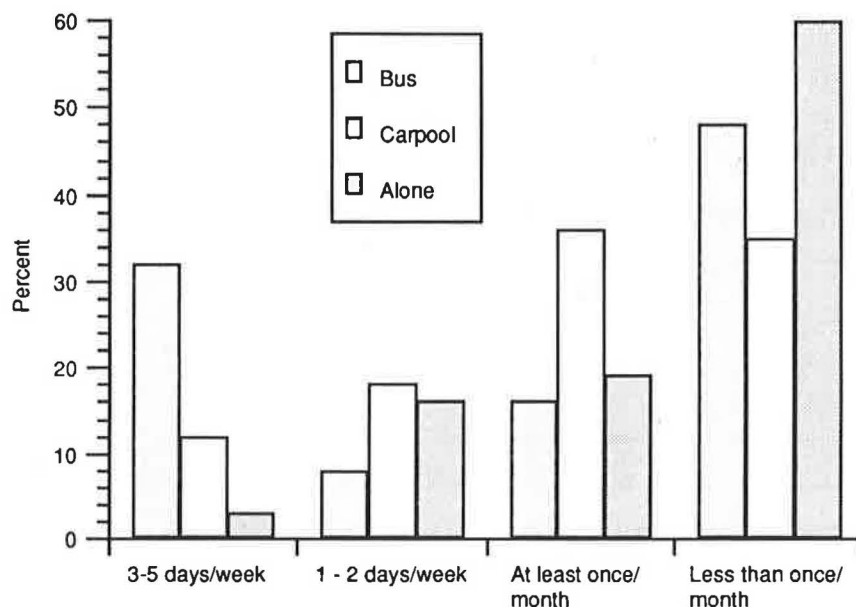


FIGURE 3 Frequency of HOV lane use by mode.

mode. Over 75 percent of every mode group, including people who admitted using HOV lanes while alone in a vehicle, believed that HOV lanes are a good idea.

Another question designed to determine the public's attitude toward HOV lanes was, "Do you feel that the use of carpool lanes by cars without the proper number of people is a serious problem, minor problem, or not a problem?" Over 75 percent (76.2 percent) of the respondents felt HOV lane violations were a problem. However, over 50 percent (51.2 percent) of the respondents felt violations were a minor problem, while only one-quarter (25.1 percent) of the sample felt they were a serious problem. In addition, about 17 percent of those sampled felt these violations were not a problem at all (Table 1). However, the interpretation of this result was difficult; either people did not think enough violations were occurring to warrant labeling the problem as "serious," or

many people did not view HOV lane violations as serious infractions of the law.

Neither mode choice nor area of residence had a significant effect on attitudes toward HOV violations. However, when the results of this question were cross-tabulated with the results from the previously discussed question (i.e., "Are HOV lanes a good idea?"), a statistically significant difference was found between people who felt HOV lanes were a good idea and those who felt they are not a good idea. People who did not think HOV lanes were a good idea were more likely to feel HOV lane violations were not a problem than were those who thought HOV lanes were a good idea.

Finally, the people surveyed were presented with a series of statements about HOV lanes and their effects. Respondents were asked whether they agreed or disagreed with each statement. The responses to these questions are presented in

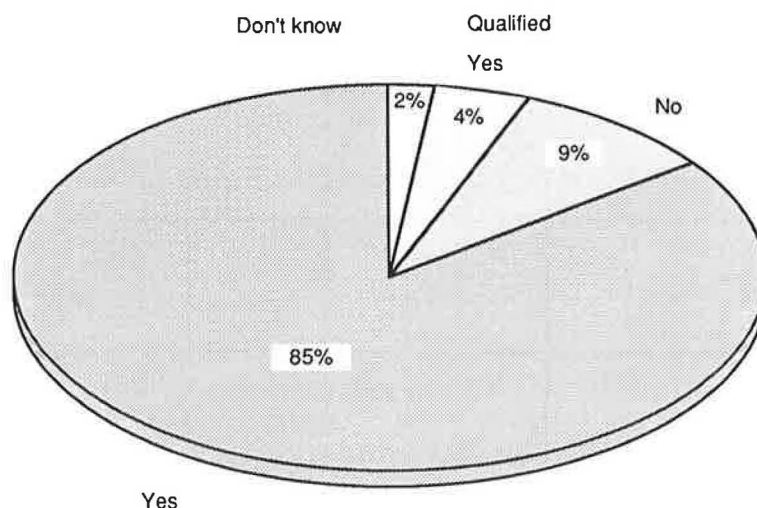


FIGURE 4 Attitudes toward HOV lanes (N=551).

TABLE 1 ATTITUDES TOWARD HOV LANES VERSUS PERCEPTIONS ABOUT HOV LANE VIOLATIONS (N = 551)

ARE HOV LANES IN SEATTLE A GOOD IDEA? (READ ACROSS)					
HOW SERIOUS ARE HOV VIOLATIONS?	YES; A GOOD IDEA	QUALIFIED YES	NOT A GOOD IDEA	DON'T KNOW	TOTAL
A serious problem	120 ^a (25.8) ^b	8 (32.0)	10 (20.0)	0 (0.0)	138 (25.1)
A minor problem	247 (53.0)	12 (48.0)	19 (38.0)	4 (40.0)	282 (51.2)
Not a problem	70 (15.0)	3 (12.0)	20 (40.0)	3 (30.0)	96 (17.4)
Don't know	29 (6.2)	2 (8.0)	0 (0.0)	3 (30.0)	34 (6.2)
Refused to answer	0 (0.0)	0 (0.0)	1 (2.0)	0 (0.0)	1 (0.0)
Total	466 (100.0)	25 (100.0)	50 (100.0)	10 (100.0)	551 (100.0)

^a number of respondents^b percent of respondents

Table 2. Most of those sampled agreed with the statement that HOV lanes saved time for people who used the lanes (96 percent agreed strongly or somewhat with this statement). The majority of those sampled also felt that HOV lanes did not worsen traffic in other lanes, were not unfair to drivers who could not use them, and did not increase the number of accidents. However, the results of two other questions were less positive. Only 39 percent of the sample felt HOV lanes

reduced traffic congestion in all lanes, approximately the same percentage that disagreed with the statement that HOV lanes reduced air pollution.

The HERO Program

Previous studies conducted by Seattle Metro indicated that most people generally favored the HERO hotline program.

TABLE 2 PERCEIVED EFFECTS OF HOV LANES

QUESTIONS	DISAGREE STRONGLY	DISAGREE SOMEWHAT	DON'T KNOW	AGREE SOMEWHAT	AGREE STRONGLY	REFUSED
HOV lanes save time for people who use them	0.90 ^b	2.50	0.50	15.40	80.60	0.00
HOV lanes worsen traffic in other lanes	44.60	28.30	3.10	10.90	13.10	0.00
HOV lanes are unfair to those who don't use them	53.70	26.70	3.10	7.80	8.70	0.00
HOV lanes reduce congestion in all lanes	20.50	18.10	5.40	31.80	24.00	0.20
HOV lanes increase the number of accidents	51.40	26.50	10.70	6.50	4.00	0.90
HOV lanes reduce air pollution	23.00	16.50	14.50	26.10	19.10	0.40

^a Rows total to 100%^b Numbers shown are percentages

For example, a survey Metro conducted in 1986 (2) found that more than 60 percent of those surveyed were glad they could use HERO to report HOV violations. However, since the hotline's inception in 1984, no survey had examined attitudes toward the HERO program's effectiveness in reducing HOV lane violations, nor had any survey determined the percentage of people who knew of HERO's existence. Survey questions were therefore aimed at determining public awareness of and attitude toward the HERO program.

Awareness of the HERO Program

Knowledge of the hotline was fairly high; 81 percent of the sample knew about the HERO program. Persons who used carpools were more likely to know about the program than were those who used other modes while in the HOV lanes. Approximately 65 percent of those who had never used the lanes knew about the program.

Use of the Hotline

Not many of the people in the sample had actually used the hotline to report an HOV violation (i.e., 6.3 percent of those who knew about HERO, or 5.1 percent of the total sample). Because Metro and WSDOT had not marketed the program since 1984, the percentage sampled who said they had used the hotline was not unreasonable low.

Attitudes Toward the HERO Program

When people who knew about HERO were asked whether they thought the program was a good idea, the majority (71

percent) thought the program was a good idea (Figure 5). The percentage of people who liked the idea of the HERO program differed only slightly among users of different modes (Figure 6). Interestingly, 75 percent of those who said they had never used the HOV lanes thought HERO was a good idea (only 22 percent thought HERO was a bad idea). In contrast, approximately 59 percent of those who admitted using an HOV lane while alone in a vehicle were in favor of the HERO program.

Attitudes Toward HERO's Effectiveness in Reducing the Violation Rate

Two of the survey's questions were designed to determine whether people believed that HERO reduced the illegal use of HOV facilities. Half of those people who knew about the HERO program thought that the hotline did help reduce violations (Figure 7). However, when asked how much they thought HERO reduced the illegal use of HOV lanes, only 6 percent of those sampled believed the hotline reduced HOV violations a great deal. About 24 percent of those asked thought HERO did not reduce the illegal use of HOV lanes at all (Figure 8). These results were interesting because 70 percent of those asked felt that HERO was a good idea.

The comparison of the responses to these two questions was interesting. In the first question, 32 percent of the respondents said HERO did not reduce HOV violations, while 24 percent responded to the second question that HERO did not reduce illegal use of the HOV lanes. In total, while 50 percent of the respondents said they thought HERO reduced violations, 71 percent stated that HERO reduced the illegal use of HOV lanes. This discrepancy most likely resulted from the wording of the two questions, but the magnitude of difference was surprising.

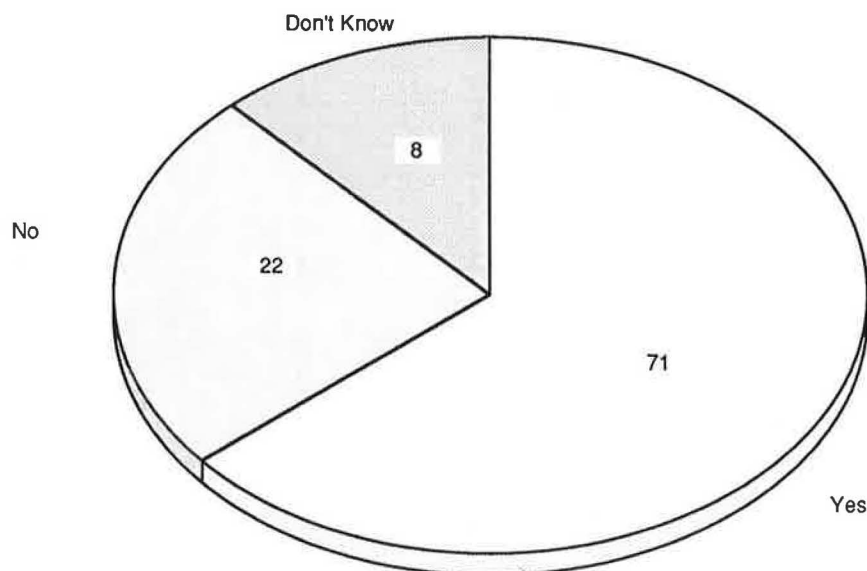


FIGURE 5 Attitudes toward HERO program.

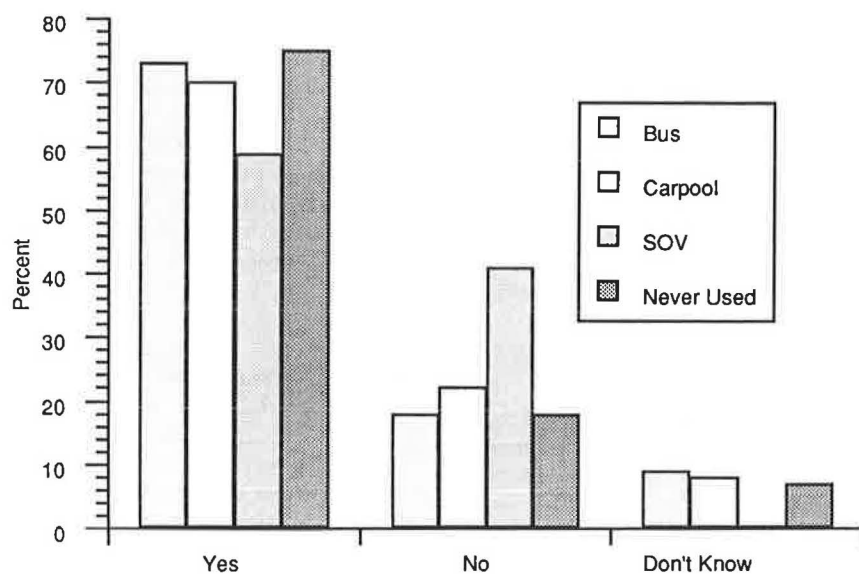


FIGURE 6 Attitudes toward HERO program by vehicle used in the HOV lane.

EVALUATION OF THE HERO HOTLINE PROGRAM

The HERO hotline program was first implemented in February 1984 by WSDOT, WSP, and Metro. The objective of the program was to develop innovative and cost-effective enforcement techniques that were less disruptive to traffic than traditional methods. Studies of the HOV violation rate conducted before and after HERO's implementation showed that the violation rate on the I-5 HOV lanes decreased by 33 percent (from 28.3 to 19.1 percent averaged over four mainline I-5 locations). This decrease was attributed to the existence of the HERO program. Because the program's implementation had been coordinated with an extensive public information campaign, the public was well aware of the new

program, and this awareness presumably discouraged people from violating the HOV lanes. Because of the reduction in violation rates, the HERO hotline program was judged to be successful.

The HERO program had not been evaluated since the publication of the first study. Such an evaluation was necessary both to examine the long-term effects of the HERO program and to justify continued expenditure on the program. Therefore, in addition to the survey reported on in this paper, the HERO hotline program was evaluated through a three-week-long HOV lane violation monitoring study.

The violation rate on I-5 at N.E. 175th was significantly lower after HERO's implementation (8.5 percent) than it was just before HERO was implemented (17.3 percent). The maximum violation rate observed in the data collected for this

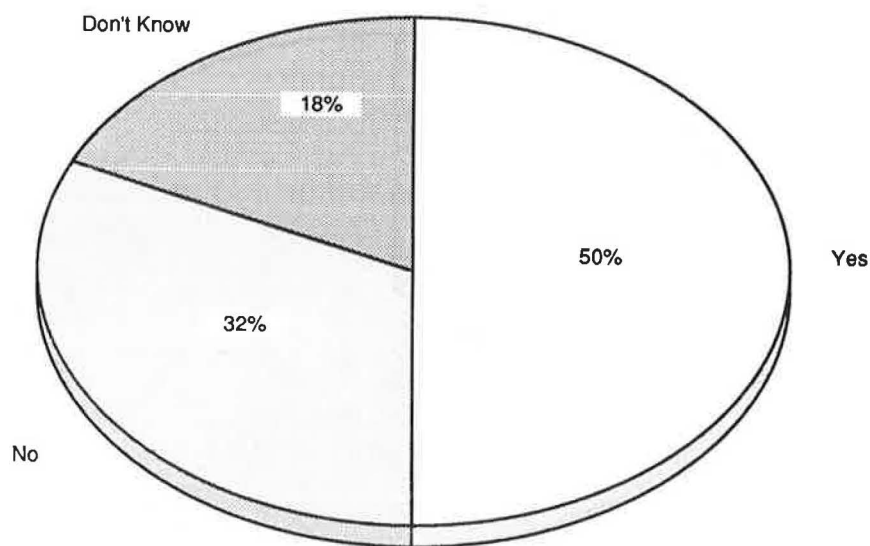


FIGURE 7 Attitudes toward effectiveness of HERO hotline in reducing violation rate (N=448).

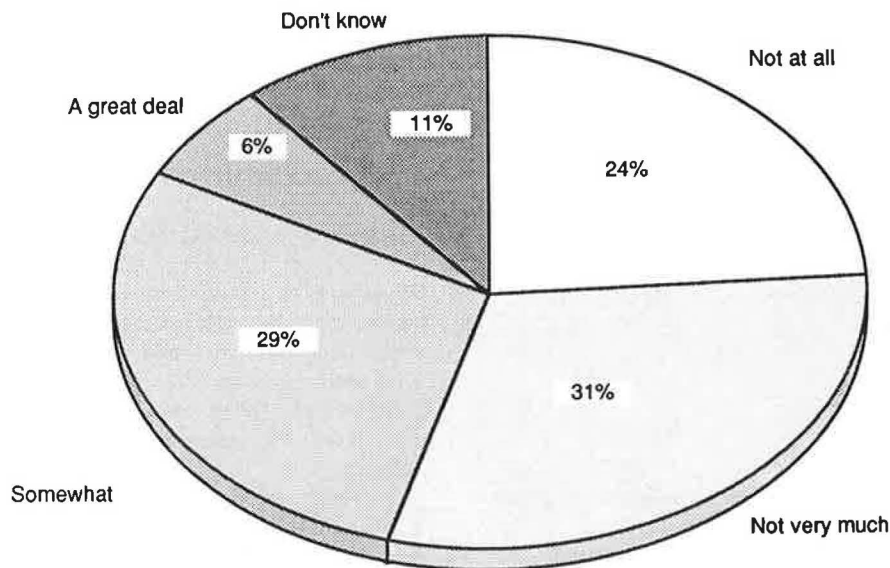


FIGURE 8 Attitudes toward effectiveness of HERO hotline in reducing illegal use of HOV lanes.

project was 15.3 percent, while the minimum violation rate was 13.0 percent. (The maximum rate assumed that all misses—vehicles in which the exact number of people could not be determined—were violators. The minimum rate assumed that misses were not violators.) The significance of these differences could not be tested because the raw data on violation rates before HERO was implemented were not available.

HERO's impact on the violation rate can not be assessed. If the HOV violation rate measured as part of this project had been proven to be significantly lower than the "pre-HERO" violation rate, factors other than HERO may have been responsible for the decrease.

However, at least one factor present could have pushed violation rates higher. Conventional wisdom suggests that violation rates increase as traffic volumes and congestion increase. Between 1983 and 1986, morning peak period traffic volumes increased by 32 percent on southbound I-5 near the HOV lanes (3). The increased traffic volumes suggested that the pressure for violations had increased since implementation of the HERO program, while the actual violation rates were slightly lower than before the program's commencement. Although this information did not prove that the HERO program kept violation rates lower than they might otherwise have been, it did suggest the possibility that the HERO program continues to discourage motorists from violating the HOV regulations.

CONCLUSIONS

Attitude Survey

Support for both the HOV system and the HERO hotline program was high. Almost everyone sampled knew about the HOV system and the majority had used an HOV lane at least once. The high level of support for HOV lanes (85 percent

thought they are a good idea) was particularly gratifying, because many people used the HOV lanes only infrequently.

Similarly, the majority of those sampled knew about the HERO program and most of those who knew about it were in favor of it. However, people generally didn't feel the program significantly reduced HOV lane violations. The public's favorable attitude must have stemmed from a different source. People might have liked the program because it allowed them to vent their frustration at being caught in traffic and seeing HOV lane violators drive by at 55 mph without being penalized.

The overwhelming public support of these programs was an indication that investment in HOV facilities in Seattle is appropriate. Previous studies conducted in Seattle had concluded that the HOV lanes constructed in the area were cost-effective (4). However, for an investment of public funds in any program to be an appropriate action, not only does the investment need to be cost-effective, but the public must support the investment. The findings cited here, coupled with the previous cost-effectiveness findings, give a strong indication of the appropriateness of HOV investments.

Evaluation of HERO Program

The earlier discussion of the evaluation of the HERO hotline program outlined some of the factors that were used to evaluate the program, including both the hotline's effect on the HOV lane violation rate and the public's attitude toward the hotline.

The violation rate measured as part of this project was slightly lower than the violation rate measured before HERO's implementation, but the significance of this difference could not be determined. The research team was not able to prove that the existence of the HERO program had, in the long run, discouraged people from violating the HOV lanes and thus kept the violation rate lower than it would have been if

HERO had not existed. However, the public's attitude toward the program was favorable. Most of the people who knew about HERO liked it despite the fact that they thought it did not appreciably reduce HOV violations.

Because the violation rate was somewhat lower than the rate before the HERO program had begun, despite an increase in the traffic volumes and congestion levels throughout the region, and the positive public perception of the program indicated that the HERO program is a beneficial program and its continuation is warranted.

RECOMMENDATIONS

Public Attitude Surveys

The public survey was useful in demonstrating the high degree of general public support for HOV lanes and the HERO program. The research team recommends that attitude surveys be used more frequently. The results of the surveys can be used to determine whether a market segment should be targeted for specific promotional or marketing efforts. These results can also be used to support the implementation of additional HOV actions. Public attitude surveys should also be an element of any continuous evaluations.

HERO Hotline Program

Because the HERO hotline appears to be an effective tool for relieving the public's frustration over often unpenalized HOV lane violators, the project team recommends that the hotline be continued. The team also recommends that WSDOT, Metro, or WSDOT and Metro take the following actions to increase the effectiveness of the HERO hotline program:

- A marketing and public education campaign to increase the public's awareness of the hotline and to encourage more people to use the hotline should be implemented.
- Encourage people with cellular phones to use the hotline by allowing them to call in at no cost to themselves. To encourage more car phone owners to use HERO, Metro and

WSDOT should consider paying for calls made from cellular phones on a trial basis to determine whether this action significantly increases the number of violations reported.

ACKNOWLEDGMENTS

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Finally, we would like to thank the Washington State Transportation Center staff for their assistance in putting this report together, particularly Amy O'Brien and Ron Porter.

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