

Commuter Attitudes Toward Proposed High-Occupancy-Vehicle Lanes in Orange County, California

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ABSTRACT

A telephone attitudinal survey was made of commuters on two freeways in Orange County, California--the Santa Ana Freeway (I-5) and the Newport-Costa Mesa Freeway (Route 55). The survey was undertaken as part of an interagency effort to evaluate the potential effectiveness and public acceptability of high-occupancy-vehicle (HOV) lanes under consideration for these freeways. Telephone surveys were conducted with persons who regularly use these freeways three or more days per week during the morning or evening peak periods, or both. Respondents were identified by a combination of videotaping of midstream freeway movements and selected on-ramp monitoring. The findings provide insight into the reaction of the public toward HOV lanes, offer guidance on lane design and operation, and will assist in formulating a program to increase public awareness and lane use. The major conclusion is that more than 75 percent of the regular freeway commuters surveyed are in favor of testing HOV lanes on these freeways, despite the relatively low rate of ridesharing among current freeway users and despite the fact that most commuters consider other types of improvements to be more effective methods of reducing freeway congestion. Respondents expressed concerns about the HOV-lane concept, in particular with respect to safety and enforcement, but also believed that the lanes would serve to reduce congestion and driving time and provide an incentive to carpool.

The Orange County Transportation Commission has been participating in an interagency effort to evaluate the potential effectiveness and public acceptability of high-occupancy-vehicle (HOV) lanes in Orange County. Known also as carpool or commuter lanes, HOV lanes are special lanes that are added for use by motor vehicles occupied by more than one person, which includes carpools, vanpools, taxis, and public and privately operated buses. HOV facilities are currently under consideration for many of the county's most severely congested freeways, including the Santa Ana Freeway (I-5), the Newport-Costa Mesa Freeway (Route 55), the San Diego Freeway (I-405), and the Orange Freeway (Route 57). Such facilities are considered to provide a cost-effective means of increasing the person-carrying capacity of the county's transportation system in that they allow more people to be carried in fewer vehicles.

To assist the commission in this interagency effort, this study was conducted to provide input concerning the public acceptability of HOV commuter lanes under consideration for I-5 and Route 55, to provide guidance on how such lanes should be operated, and to assist in formulating recommendations to increase public awareness and lane use. A telephone-administered attitudinal survey was specially designed and conducted to address the following key objectives:

- Identify potential users and nonusers of HOV commuter lanes proposed on these two freeways;

- Provide insight on the attitudes and expectations of potential HOV-commuter-lane users and nonusers concerning Orange County's transportation problems and proposed solutions, with particular emphasis on the HOV-commuter-lane concept;
- Clarify current attitudes toward ridesharing; and
- Identify key policy concerns and marketing-related issues with respect to HOV commuter lanes.

The major findings resulting from the telephone survey and evaluation effort are presented in this paper.

SURVEY DESIGN CONSIDERATIONS

A combination of observation, focus groups, and telephone and direct-mail surveying of persons currently using I-5 and Route 55 was utilized in this study. Traffic movements on both of these freeways were monitored by video cameras supplemented by manual data recording at selected freeway on ramps. In an effort to identify current freeway users, license plates of all vehicles passing observation points were recorded and transmitted to the California Department of Motor Vehicles to obtain the names and addresses of registered vehicle owners. From these names, a sample was selected for participation in a telephone survey. The sample was stratified by zip code and by on ramp in order to obtain a representative cross section of those who regularly use these freeways during the morning and evening peak periods.

Before the questionnaires used in the telephone survey effort were put into final form, focus groups were conducted to help identify key issues and con-

cerns related to transportation problems and proposed solutions and attitudes about ridesharing and special HOV commuter lanes. The focus groups also served to clarify terminology used in the survey questions.

These questionnaires were specifically designed to identify public attitudes, opinions, and current travel characteristics before the HOV-commuter-lane concept was introduced. In this way, the respondents' reactions to the proposed concept could be viewed in light of current travel behavior. To reflect the fact that different HOV-commuter-lane concepts are being considered for I-5 and Route 55, respondents were given freeway-specific descriptions of proposed projects. The project under consideration for Route 55 involves restriping the existing freeway and using the median area to provide an additional lane in each direction for use by HOVs only. The I-5 project, on the other hand, involves widening the freeway to add two more lanes in each direction. One of these new lanes would be available for all traffic, all day; the other would be used by HOVs only.

During June 1985, approximately 600 telephone surveys were conducted with persons who regularly use I-5 and Route 55 three or more days per week during the morning or evening peak periods, or both, peak periods defined as being from 6:00 to 9:00 a.m. and from 2:30 to 7:00 p.m. Roughly half of the surveys were conducted with users of I-5 and half with users of Route 55, with adjustment made for persons who used both freeways as part of their trip. To account for persons with unlisted telephone numbers, a mailback survey was also conducted.

In reviewing the findings of the telephone survey, the following factors related to survey design and sample selection should be noted. First, among users of both Route 55 and I-5, surveys were conducted only with those who were regular peak-period freeway users; such persons were considered to constitute the bulk of the potential user market for HOV-commuter-lane facilities. Thus, the findings reported here do not represent the views of all freeway users. Second, the Route 55 and I-5 surveys were conducted with slightly different interests. On Route 55, interest focused on obtaining a full profile of users along the freeway's entire 13-mi length. Thus, midstream freeway observation and observations at on ramps were combined in order to obtain a full-stream view of regular peak-period users. On I-5, on the other hand, interest focused only on persons using the freeway through one of its most critically congested sections. Thus, the I-5 data represent a snapshot view obtained only by midstream freeway observation of those persons already on the facility and passing through one of its most congested points.

An additional factor that should be noted is that in some cases, small sample sizes preclude use of the data for certain types of analyses. For example, although the data can be used to obtain an overall view of commuters' opinions, they may not be usable for contrasting the opinions of small group A with small group B and obtaining results that would be statistically significant. To assist the reader who may be interested in obtaining greater detail, a separate volume comprising the Technical Appendix to this paper and the computer printouts of tabulated and cross-tabulated detailed data are available for review. A more detailed description of the methodology used in this study is also found in the Technical Appendix.

REVIEW OF SURVEY FINDINGS

The major findings from the telephone survey effort follow. Consistent with the general organization of

the survey instrument, the discussion is organized according to the following main areas of interest:

1. Profile of respondents using I-5 and Route 55,
2. Attitudes toward Orange County's transportation problems and proposed solutions,
3. Behavior of carpoolers versus those who drive alone,
4. Attitudes toward special new HOV commuter lanes,
5. Current employer involvement in encouraging ridesharing, and
6. Current media used by commuters.

In the presentation of the data, a slash mark is frequently used; findings related to I-5 are reported on the left and Route 55 on the right of the slash.

Profile of Respondents Using I-5 and Route 55

In this section a profile of the regular peak-period user of I-5 and Route 55 is presented. Of interest is the extent to which the freeways are used by Orange County residents compared with residents of other counties and the demographic and travel characteristics of those users.

As reported in the survey, the typical commuter on both I-5 and Route 55 tends to be male (63/56 percent) with a mean age of 40 and mean family income of approximately \$47,000 per year. More than 70 percent of the respondents on both freeways have at least some college education, and more than 85 percent come from households with at least two licensed drivers and at least two registered motor vehicles. Roughly 45 percent work at places employing 50 or fewer employees and 20 percent work at places employing more than 500 employees. The majority of I-5 commuters are employed in professional and technical positions (32 percent), management (25 percent), and sales (15 percent), whereas the majority of Route 55 commuters are in professional and technical (35 percent), secretarial and clerical (35 percent), and management (30 percent) positions.

As indicated in Table 1, between 70 and 80 percent of the respondents on both freeways reside in Orange County, and 20 to 30 percent reside outside Orange County. On the basis of the county of registration of all vehicles using the freeways during peak travel times, roughly 70 percent are from Orange County, whereas on the basis of the place of residence reported by regular users (those using the freeway at least three days per week), approximately 80 percent are from Orange County.

Within Orange County, regular peak-period users of I-5 tend to reside in the county unincorporated

TABLE 1 Residential Location of I-5 and Route 55 Commuters

Location	Vehicle Registrations (%)		Residence (%)	
	I-5	Route 55	I-5	Route 55
Orange County	63	68	83	81
Los Angeles County	19	10	17	5
Riverside County	1	8	3	14
San Bernardino	2	3	—	2
San Diego	5	2	2	—
Other California	9	8	—	—
Outside California ^a	2	1	—	—
	100 ^b	100	100 ^b	100 ^b

^a Refers to vehicles with California registrations held by leasing companies outside of California. Vehicles registered out of state were not included in the data but are considered to constitute approximately 7 percent of average daily traffic on both freeways.

^b Rounding error.

area (26 percent), Irvine (12 percent), and Anaheim (12 percent), whereas regular users of Route 55 tend to reside in Santa Ana (14 percent), Anaheim (13 percent), Orange (12 percent), and Tustin (10 percent). Residents from each of the remaining jurisdictions constitute less than 10 percent of the users of these facilities.

Roughly 90 percent of the respondents on both freeways work in Orange County, chiefly in the cities of Santa Ana (15/21 percent), Irvine (17/14 percent), and Anaheim (12/13 percent).

In terms of travel characteristics, nearly 80 percent of the regular peak-period users included in the sample use I-5 or Route 55 five days per week; the balance use it three or four days per week. More than 80 percent travel during both the morning and evening peak periods. Persons who use I-5 for part of their trip tend to have total travel times of 40 min in the morning and 46 min in the afternoon, with the average number of miles traveled on I-5 itself being 19 mi. Those who use Route 55 for part of their trip have shorter total travel times than users of I-5; average total travel time for Route 55 users is 34 min in the morning and 38 min in the afternoon. The average number of miles traveled on Route 55 itself is 6.

For users of both freeways, travel times are reported to be longer in the afternoon peak period than in the morning. When traffic is perceived by the respondents at being "exceptionally bad," travel times on both freeways are reported to increase by roughly one-third.

When freeway traffic is bumper to bumper, 66 percent of the respondents using I-5 stay on the freeway and 26 percent use the local streets. Among users of Route 55, on the other hand, 54 percent stay on the freeway and 43 percent use the streets instead. Possible inferences that may be drawn from the data are that I-5 lacks good parallel arterial relief routes; that traffic is worse on Route 55, forcing more people into alternative routes; or that the shorter trip lengths on Route 55 enable local alternative routes to suffice.

Because more than 90 percent of the respondents report their primary trip purpose to be commuting to and from work, the data indicate that in the aggregate, considerable variation currently exists within the county with respect to work start and stop times. In terms of trip start times, users of both I-5 and Route 55 begin their morning and afternoon peak-period trips over an extended period of time. Roughly 20 percent of the I-5 users begin their morning trips before 6:00 a.m., 30 percent between 6:00 and 7:00 a.m., 30 percent between 7:00 and 8:00 a.m., and 20 percent after 8:00 a.m. In comparison, 10 percent of the users of Route 55 begin their morning trips before 6:00 a.m., 25 percent between 6:00 and 7:00 a.m., 40 percent between 7:00 and 8:00 a.m., and 25 percent after 8:00 a.m.

Afternoon trip start times are similarly extended over a long peak period. Roughly 20 percent of both I-5 and Route 55 users begin their afternoon trips before 4:00 p.m., 30 percent between 4:00 and 5:00 p.m., 30 percent between 5:00 and 6:00 p.m., and 20 percent after 6:00 p.m.

Attitudes Toward Orange County's Transportation Problems and Proposed Solutions

When asked to identify what they considered to be the most heavily congested freeway in Orange County, 55 percent of the respondents were likely to mention the freeway they travel. For users of I-5, 57 percent noted I-5 and 37 percent mentioned Route 55. Among users of Route 55, 56 percent mentioned Route 55 and 35 percent, I-5. Nearly two-thirds of the respondents on both freeways believe that traffic on the freeway they use is "always" or "almost always" "exceptionally bad."

A comparison of how respondents on I-5 and Route 55 rated the effectiveness of possible improvements to the two freeways is given in Table 2. For both freeways, respondents considered "add one lane in each direction for use by all traffic" to be most effective, followed by "spread out work start/stop times." In the Route 55 survey, "using the median next to the center divider as another lane of traffic" scored third, although the improvement did not specifically call for exclusive use by carpoolers. On both freeways, the improvement related to the addition of lanes exclusively for HOVs ranked third from the least effective and ranked 6 out of 8 in the I-5 survey and 7 out of 9 in the Route 55 survey.

Behavior of Carpoolers Versus Those Who Drive Alone

A discussion of the extent of current carpooling activity among users of I-5 and Route 55 and the opinions of carpoolers and noncarpoolers about ridesharing follows.

On both the I-5 and Route 55 surveys, roughly 90 percent of the respondents using these freeways currently drive alone, 12 to 14 percent carpool at least one day per week, and 1 percent use transit. The 12 to 14 percent for carpooling is slightly below the countywide average of nearly 17 percent reported in the 1980 census journey-to-work data. Among those who currently carpool on I-5 and Route 55, respectively, 73/66 percent drive with one other person, and 15/23 percent with two other persons; the remaining 12/11 percent drive with three or more other persons. Roughly one-third now carpool with members of their family. Most carpools were established either by knowing a fellow employee or student or by employer arrangement.

TABLE 2 Effectiveness Rank of Possible Improvements to I-5 and Route 55

Improvement	Rank by Freeway	
	I-5	Route 55
Add one lane in each direction for use by all traffic	1	1
Spread out work start and stop times	2	2
Use median next to center divider as another lane of traffic	n.a.	3
Build new freeways	3	5
Build rail system	4	6
Employers should encourage employees to share rides with others	5	4
Add one lane in each direction for use by those whose vehicles have two or more people in them	6	7
Improve local streets and roads	7	8
Improve and expand bus service to get people on freeway out of their cars	8	9

Note: n.a. = not applicable.

Few demographic variables tested in this survey directly affect or correlate with the likelihood of carpooling. Carpoolers appear to come from all income levels, both sexes, and various demographic profiles. Carpoolers in this survey had mean incomes that were comparable with those of persons who drive alone. Both carpoolers and noncarpoolers generally had similar average trip lengths, with one exception; afternoon carpoolers on Route 55 had significantly longer trips than noncarpoolers. The single demographic factor that can consistently be pointed to is employer size; that is, carpoolers tend to work for bigger companies than do those who drive alone. Because the larger companies reported in this survey also tend to be more involved in rideshare promotional activities, the combination of opportunity and supportive rideshare services has apparently had an effect on getting employees to ride-share.

Because of small sample size, it is generally not possible to identify statistically significant differences between counties or cities of residence with respect to rates of current carpooling activity. The one exception that can be reported is that a significantly larger percentage of Riverside County residents using Route 55 carpool than do Orange County residents (19 percent compared with 13 percent).

Among those who currently carpool, key motivators are cost savings (by far the most important), less wear and tear on the car, reduced driving stress, and opportunity to socialize.

In contrast to the carpoolers, those who drive alone gave a variety of reasons for not carpooling or vanpooling or not doing so more often. On both freeways, the three predominant reasons were that the work schedule does not permit it, they don't know anyone to ride with, or they use the car at or during work. It should be noted that in the absence of supportive ridesharing information and promotional services, most of these reasons would continue to prevail regardless of what is done to improve traffic on the freeways. Of the reasons given for not carpooling, 35/50 percent are issues that could potentially be addressed by extensive rideshare program development and marketing efforts. An additional 10 percent are intangibles based on attitudes that would be difficult to reverse.

Of those who currently drive alone, 65 percent noted that they would not carpool in any case, even if it would save them travel time. Among the remaining respondents, users of both freeways identified similar motivators to carpool. Approximately 25 percent of these motivators could be provided with the assistance of employers; they include knowing someone with the same work schedule, knowing someone to carpool with, saving costs, and being given employer assistance. For those respondents for whom travel-time savings could provide motivation to carpool, the mean travel-time savings reported as desirable was 21 min for users of I-5 and 12 min for users of Route 55.

Attitudes Toward Special New HOV Commuter Lanes

The attitudes and concerns of current peak-period commuters toward the testing of HOV-commuter-lane projects on I-5 and Route 55 of particular interest are the following:

- What is the extent of public support for the proposed demonstration projects?
- What are the perceived advantages and disadvantages of such facilities?
- What would commuters call such facilities?

• How do regular freeway users think the new lanes should be designed and operated?

• To what extent would persons who do not currently carpool consider increasing the number of people they currently ride with in order to be able to use the new lanes?

As part of the telephone survey, a description of the new lane concept being considered for each of the two freeways was presented to respondents. Descriptions were different for I-5 and Route 55. For I-5, the description was as follows:

Caltrans is thinking about adding two new lanes in each direction to the Santa Ana Freeway (I-5), from I-605 on the north to I-405 on the south. One of these new lanes would be available for use by all traffic, all day. The other new lane would be used by people who have more than one person in their vehicle.

The description used to describe the HOV-commuter-lane project under consideration for Route 55 was as follows:

Caltrans is thinking of adding a lane in each direction to the entire length of Route 55. The lanes would be added by using the area between the center divider and the left traffic lane. These lanes would be used only by people who have more than one person in their vehicle, and only during peak hours, for example, 6:00 to 9:00 in the morning, and 2:30 to 7:00 in the afternoon/evening.

The project descriptions used terminology demonstrated to be understandable to the public through the focus groups and avoided the introduction of bias that could have resulted if words like "use the emergency shoulder" had been used to describe the projects.

Despite the low rate of ridesharing among current freeway users, more than 75 percent of the respondents on both freeways were in favor of testing HOV commuter lanes on I-5 and Route 55. Although respondents residing in Riverside and Los Angeles counties were more likely to be in favor of the HOV-commuter-lane demonstrations than were residents of Orange County, sample sizes were generally too small for use in identifying significant differences in the level of public support by county or city of residence or by place of employment. Support for the demonstrations was shared equally by morning and afternoon peak-period commuters.

For I-5 and Route 55, respectively, 83 and 72 percent of respondents noted advantages associated with the HOV-commuter-lane concept. The major advantages perceived by users of these freeways were "reduce congestion," 40/46 percent of all respondents; "good incentive to carpool," 23/27 percent of all respondents; and "will reduce driving time," 20/21 percent of all respondents. All other advantages were each mentioned by less than 4 percent of the respondents.

Disadvantages of the HOV-commuter-lane concept were noted by 67 percent of the respondents using I-5 and by 72 percent of the respondents using Route 55. The main disadvantages cited differed by freeway. On the I-5 survey, the primary disadvantages perceived were "inability to enforce it" (20 percent), "should be for all vehicles to use, not just carpoolers" (17 percent), "too expensive" (8 percent), "will not reduce congestion" (8 percent), and "construction hassle" (7 percent). On Route 55, there was concern that the new lanes would be "un-

safe without the median for emergencies" (34 percent) and "unsafe for lane changing and getting on/off the lane" (17 percent). These were followed by "difficult enforceability" (15 percent) and "should be for all vehicles to use, not just carpoolers" (14 percent).

Survey respondents were asked two questions about possible names that could be given to lanes for use by vehicles with more than one person. First, respondents were asked to personally select a name for such facilities; they were then asked to respond to a list of names provided by an interviewer. These questions were included in order to see whether a respondent's attitude would be reflected in the name suggested. In addition, these questions assisted in identifying terminology that would be acceptable and understandable to the public in the absence of marketing. On the basis of the results of the survey, the term "carpool lane" was initially more acceptable to the public than any other terminology. The top three proposed names for the new lanes on both surveys were "carpool lane" (17/18 percent), "diamond lane" (13/14 percent), and "express lane" (7/8 percent). From a list of names presented, respondents most frequently chose "carpool lane" (33/35 percent), "express lane" (26/27 percent), and "commuter lane" (17/20 percent).

Freeway users were also asked their opinion on how the proposed new lanes should be designed and operated. In identifying design features considered to be important, respondents tended to mention those that would avoid confusion and increase safety. On I-5 items mentioned most frequently were "special restricted exits and entrances" (8 percent), "traffic officer controlled/enforced/give fines" (7 percent), and "special electronic overhead signs or green-red" (7 percent). On Route 55 the most frequently mentioned design features were "special electronic overhead signs" (9 percent) and "special lane markings/arrows in pavement" (7 percent).

Roughly 70 percent of the respondents on both freeways identified two or more persons as the required vehicle occupancy for an HOV commuter lane. Respondents were about equally divided as to whether the new lanes should be available during peak hours only or for use all day.

To assist in identifying the level of interest of potential users, respondents were asked the likelihood of their increasing the number of people they currently ride with in order to use the new lanes. Of the respondents who do not now carpool, 8 percent indicated that they would be "very likely" to increase the number of people in their vehicle in order to use the new lanes; an additional 18 percent reported that they would be "somewhat likely" to do so. Roughly 65 percent reported that they would be "not at all likely" to change their current travel behavior and would not carpool.

Current Employer Involvement in Encouraging Ridesharing

Respondents were asked what their employers or schools now do to encourage carpooling and what else they could or should do. In both the I-5 and Route 55 surveys, 72 percent of the respondents noted that their employers now do nothing to encourage ridesharing, and roughly 50 percent believed that employers should do nothing. Smaller establishments were significantly less likely to offer services to encourage ridesharing than were larger employers. For example, although 86 percent of the companies employing 50 or fewer employees did nothing, this number drops to 46 percent of employers of 500 or more.

In terms of the types of services currently offered, carpool-matching services were most frequently mentioned (11/9 percent). Few other activities are now offered by employers. Respondents noted that employers could do more by offering matching services, providing publicity for carpoolers, adjusting start and stop times, and helping to pay for carpools and vanpools.

As noted earlier, there is a direct relationship between size of employer and the likelihood that the employer will offer carpool encouragement to employees. Larger companies were not only more likely to provide ridesharing services, they also varied from smaller companies in terms of the types of services offered. In addition, respondents employed by larger companies were significantly more likely to expect their companies to offer such services than were respondents from smaller firms.

Current Media Used by Commuters

Respondents were asked a variety of questions about their most important sources of information about transportation, including their most frequently read newspapers and most frequently listened-to radio stations. These data were compiled for possible future use in the development of a marketing and information dissemination program in support of the proposed HOV-commuter-lane demonstrations.

Survey respondents identified newspapers as their single most important source of information about local transportation issues (45 percent), followed by radio (29/33 percent), television (18/21 percent), and direct mail (8/9 percent).

The Register was the newspaper most frequently read. Fifty percent of the respondents on both I-5 and Route 55 read this paper, followed by roughly 40 percent who read the Los Angeles Times. No other newspaper was mentioned by more than 2 percent of the respondents.

Leading radio stations listened to by commuters on both freeways were KIIS, KABC, and KFWB. The data indicate that any purchase of radio time for promoting the proposed new lanes would require the use of both Los Angeles and Orange County stations in order to effectively penetrate the market. Typically, 8 to 10 stations are required to do even a marginal campaign. In order to better target the peak-period commuter market, consideration would have to be given to buying radio time during commuting hours coupled with encouragement of radio stations to cooperate in providing public service announcements.

SUMMARY AND CONCLUSIONS

The results of the telephone survey were tabulated and evaluated and will be used to assist the commission, the California Department of Transportation (Caltrans), and the specially created Route 55 Corridor Operation Advisory Committee in addressing design, operational, and public awareness issues related to proposed HOV-lane projects on these freeways.

The following key conclusions about attitudes and opinions concerning tests of the HOV-commuter-lane concept were found:

1. Despite the low rate of ridesharing among current freeway users, more than 75 percent of all respondents would be in favor of testing the HOV-commuter-lane demonstration projects proposed on Route 55 and I-5.
2. Nearly two-thirds of the respondents on both freeways perceive traffic as always or almost always

being "exceptionally bad." When asked to rank the relative effectiveness of various improvements, respondents on both Route 55 and I-5 considered that to "add one lane in each direction for use by all traffic" would be most effective, followed by "spread out work start/stop times." In the Route 55 survey, "using the median next to the center divider as another lane of traffic" scored third, although the improvement did not specifically call for exclusive use by carpoolers. The improvement related to the addition of lanes exclusively for carpools ranked 7 out of 9 in the Route 55 survey and 6 out of 8 in the I-5 survey.

3. Respondents were equally divided about whether the commuter lane should be used during peak periods only or all day. More than 70 percent of the sample believed that the lane should be available for use by vehicles with two or more persons.

4. Eight percent of the respondents indicated that they would be "very likely" to increase the number of people in their vehicle in order to use the new lanes; an additional 18 percent reported that they would be "somewhat likely" to do so. Roughly 65 percent reported that they would be "not at all likely" to change their current travel behavior and would not carpool.

5. Eighty-three percent of those using I-5 cited advantages with the HOV-lane concept compared with 67 percent who cited disadvantages. Among users of Route 55, 72 percent of the respondents cited both advantages and disadvantages. The major advantages perceived by users of I-5 and Route 55, respectively, were "reduced congestion," 40/46 percent of all respondents; "good incentive to carpool," 23/27 percent of all respondents; and "will reduce driving time," 20/21 percent of all respondents.

6. The major disadvantages with the HOV-commuter-lane concept noted by respondents differed by freeway. In the I-5 survey, the primary disadvantages perceived were "inability to enforce it" (20 percent), "should be for all vehicles to use, not just carpoolers" (17 percent), "too expensive" (8 percent), "will not reduce congestion" (8 percent), and "construction hassle" (7 percent). On Route 55, there was concern that the new lanes will be "unsafe without the median for emergencies" (34 percent), and "unsafe for lane changing and getting on/off the lane" (17 percent). These are followed by "difficult enforceability" (15 percent) and "should be for all vehicles, not just carpoolers" (14 percent).

7. The predominant name used to describe the new lanes was "carpool lane" (33/35 percent), followed by "express lane" (26/27 percent) and "commuter lane" (17/20 percent).

8. In terms of current travel behavior, roughly 90 percent of all respondents currently drive alone, 14 percent carpool at least one day per week, and 1 percent use transit. Among those who currently carpool on I-5 and Route 55, respectively, 73/66 percent drive with one other person and 15/23 percent with two other persons. Total travel times are longer for those who use I-5 than for those who use Route 55; the average times are roughly 45 min and 35 min, respectively. For users of both freeways, travel times are significantly longer in the afternoon peak period than in the morning.

9. Peak-period travel is spread across an extended peak that lasts roughly from 6:00 to 9:00 a.m. and from 2:30 to 7:00 p.m. Because more than 90 percent of the respondents report their primary trip purpose as commuting to and from work, the data indicate that in the aggregate, considerable variation currently exists within the county with respect to work start and stop times.

10. The predominant reasons given for not car-

pooling or vanpooling were "work schedule doesn't permit it," "don't know anyone to ride with," and "use car at/during work." It should be noted that in the absence of supporting ridesharing information and promotional services, most of these reasons will continue to prevail regardless of what is done to improve traffic on the freeways. Some 35/50 percent of the reasons identified are issues that could potentially be addressed by extensive rideshare program development and marketing efforts.

11. Among those who carpool, the key motivators were cost savings (34 percent), less wear and tear on the car, reduced driving stress, and opportunity to socialize. Few demographics in the survey directly affected or correlated with the likelihood of carpooling. Carpoolers come from all income levels, both sexes, and various demographic profiles. The only demographic factor that one can consistently point to from this survey is "employer size"--carpoolers tend to work for bigger companies than do those who drive alone. In addition, consistent with the findings of other studies, persons who carpool (on Route 55 only) tend to have longer total travel times than those who drive alone.

12. About 72 percent of all respondents noted that their employers or schools currently do nothing to encourage carpooling, and about 50 percent believe that employers should do nothing. The most frequent carpool promotional activity now offered is carpool matching, which is offered by 9/11 percent of the respondents' employers. Few other activities are now offered by employers. Respondents noted that employers could do more by offering matching services, providing publicity for carpoolers, adjusting start and stop times, and helping to pay for carpools and vanpools.

13. Commuters rely primarily on newspapers for information about local transportation improvements and to a lesser extent on radio and television. Although direct mail was not reported to be a major source of information, direct mail targeted through employers could provide a cost-effective way to supplement more broad-scale marketing activities to reach potential HOV-commuter-lane users within the I-5 and Route 55 corridors.

RECOMMENDATIONS

The results of the attitudinal surveys conducted as part of this study point to the following recommendations for consideration by the commission, Caltrans, and the Route 55 Corridor Operations Advisory Committee. These recommendations should be integrated into activities currently under way to evaluate the potential role of HOV-commuter-lane facilities in Orange County.

1. Although there is support by more than 75 percent of the survey respondents for testing the HOV-commuter-lane projects being considered for I-5 and Route 55, it is important that the lane concept be thought of as a test, particularly on Route 55. Freeway users are concerned about traffic congestion on these roadways, but they perceive HOV lanes to be less effective than additional lanes for all traffic. Officials must be willing to terminate the project if operational feasibility or effectiveness or both are not demonstrated. An evaluation program, with frequent reporting of results, should be part of the test.

2. In light of the concerns of the public demonstrated in this survey, it is essential that the safety and enforcement issues associated with HOV-commuter-lane operation be adequately addressed in the project planning process. Although use of the

median as an additional lane for traffic was ranked among the top three most effective ways to reduce congestion, when this was proposed for HOV use, respondents were concerned about loss of an emergency breakdown area, lane access and egress, and lack of enforcement. Freeway users also need to be made aware of the fact that many of the county's freeways--including sections of I-5--now lack a standard median.

3. If a decision is made to proceed with a commuter-lane demonstration, the lane should be used by vehicles with two or more persons. To encourage greater lane use, consideration should be given to allowing all forms of HOVs, including private and public buses. Either 24-hr operation or use over extended morning and evening peak periods should be considered.

4. In addition to capital projects aimed at providing new HOV commuter lanes, supportive marketing efforts and ridesharing information and promotional services should be designed to disseminate information, monitor public concerns, and encourage HOV facility use. In particular, there is a need for extensive publicity and promotion before introduction aimed at overcoming preestablished attitudes about the convenience, independence, and other perceived advantages of driving alone that are shared by most commuters. Successful project implementation will also require heavier Orange County transit district rideshare program promotion, awareness, and outreach for the general public and corridor-based employers.

5. Employer support should be encouraged as an essential component of the overall HOV-commuter-lane program. Working through employers offers a cost-effective way to reach the target commuter market, both demographically and geographically.

6. In addition to an employer-targeted effort and rideshare program promotion, a broad media campaign should be developed. Newspaper articles and advertisements, public service announcements, and radio announcements concentrated during driving times should be considered.

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