

Vanpool Operator Survey for the Washington, D.C., Region

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A survey of vanpool drivers in the Washington metropolitan region during the spring of 1989 was analyzed. The survey indicated that the number of vanpools increased from 670 in 1982 to 1,060 in 1989, a growth of almost 60 percent. The growth occurred despite the liability insurance crisis of 1985–1986 that forced a number of vanpools out of service. It was found that almost 12,200 people rode to work in vanpools on an average day, although there were more than 14,000 vanpool members. More than 2 percent of the commuters traveling to the D.C.-Arlington downtown employment center were in vanpools. Other study areas included trip length, travel time, membership, occupancy, collection and distribution, insurance, and equipment. Origin and destination analysis indicated a significant vanpool market share from Prince William County (approximately 30 mi southwest of Washington). Of the 17,300 commuters traveling daily from Prince William County to the downtown employment center, 3,140 (18 percent) were in vanpools. Prince William County had the largest number of originating vanpools of any county—more than 300. Among the strongest incentives for vanpool formation were high-occupancy vehicle lanes linked to employment areas with a significant parking cost.

Vanpooling is a high-occupancy commuter mode that was formally recognized during the oil embargo of 1973–1974. In the short time since then, vanpooling has become established in most U.S. metropolitan areas, including Washington, and has gained a reputation as a low-cost, efficient mode that requires little public subsidy. Vanpooling has been most successful in the long-distance commuting market, although some think that it can serve other commuter market segments.

A vanpool is defined here as a group of eight or more people who use a van for their daily transportation to and from work. The high occupancies of these vehicles have presented a special problem for the travel monitoring–cordon counting program of the Council of Governments/Transportation Planning Board (COG/TPB) because this program monitors vehicle volumes and occupancies. Monitoring vanpools in traffic is complicated by the “privacy windows” that many vanpool vehicles have for their passenger compartment. The windows use silvered or smoked glass, which makes it impossible to see into the van.

To address this problem, in 1982 the COG/TPB conducted a mail-back survey of Washington area vanpool operators. On the basis of the results of that survey, a monitoring technique was developed for the COG cordon counts, including average occupancies to be used for factoring occupancies. By 1989, it had become apparent that a revised technique was needed to reflect changes in van types and vanpool operating

procedures. Consequently, a mail-back survey of vanpool operators was conducted in May and June 1989. This report presents the results of the 1989 survey. In addition to providing the basis for new vanpool monitoring procedures for COG/TPB's cordon counts, the survey provides an opportunity to study current vanpooling practices in the region and analyze changes since 1982.

SURVEY METHODOLOGY

The survey was conducted by using a mail-back questionnaire. The surveyed population consisted of operators (drivers) of vanpools traveling to work destinations in the Washington region. Survey design was predicated on the following assumptions:

1. Given the experience of the 1982 vanpool survey, a high response rate could be expected for a mail-back survey.
2. Vanpool equipment has become standardized to the 15-passenger stretch van. This elongated van is easily recognized because of a 3-ft overhang between the rear-wheel well and the bumper and is seldom used for commuting purposes other than vanpooling.
3. Most of the vanpool population could be identified by assembling data bases available from the following sources: (a) state motor vehicle administrations, (b) ridesharing programs, (c) employers with vanpool programs, (d) third-party vanpool leasing firms, and (e) vanpool associations.
4. Most vanpools cross the Beltway in the line-haul portion of their journey to work, and thus the Beltway cordon count could be used to factor the survey response to a total population.

Following is a description of the conduct of the survey.

Assemble Population for Survey

As noted, a number of parties now keep data bases that contain names and addresses of vanpool operators. The parties each agreed to provide the operator information, which was entered into a single data base at COG/TPB. When the final data base was assembled, duplicate records were removed. The remaining 1,400 records were then converted to mailing labels.

Many identified operators actually operated more than one van. To ensure reaching all drivers, multiple copies of the survey were mailed to the multivan operators. Though

duplicates were removed from the data base (no two labels had the same address, etc.), there was still a chance that a survey was mailed directly to an individual driver and another one sent through the multivan operator who oversaw that driver's van.

Design and Print Survey Questionnaire

The questionnaire was designed on the basis of experience with the 1982 survey. Where appropriate, questions were worded consistently with the previous survey. The questionnaire was designed as a postage-paid mailback, and each was printed with a unique identifying number, so that responses could be matched with the data base for record-keeping purposes.

Conduct Mail-Back Survey

The survey questionnaires were mailed in early May 1989. The mailing period was approximately coincident with the 1989 Beltway cordon count data collection. As completed survey questionnaires were received at COG/TPB, they were logged against the original data base. The log information was used to keep track of survey respondents, to verify that no sector of the data base was subject to undue nonresponse, and to guard against duplicate responses.

In early June a second phase of the survey was conducted. This consisted of phone calls and letters to nonrespondents urging immediate response. The intent was to ensure an adequate response before the beginning of summer vacation.

June 30 was designated as the survey cutoff date. Forms received before that date were keypunched into a machine-readable data base, edited, and coded for certain responses.

Conduct 1989 Beltway Cordon Count

The 1989 Beltway cordon count was conducted in May and June. It counted all inbound traffic on 39 major highways crossing the Beltway. The counts were taken just inside the Beltway from 6 a.m. to 7 p.m. and were classified by time period, vehicle type, and vehicle occupancy. Traffic checkers were equipped with equipment having a button for vanpools. They identified a vanpool by the following characteristics: a stretch van with privacy windows and an overhang of at least 3 ft from the rear-wheel well to the rear bumper, or a van without privacy windows having eight or more occupants.

Traffic checkers were also given a picture of a stretch van. All other vehicles were to be classified by occupancy, so a van with five, six, or seven visible occupants would be counted with other vehicles having that occupancy.

Factoring the Vanpool Survey

Because of the different definitions of a vanpool and the fact that 7 percent of the responding vanpools did not cross the Beltway, a four-step process for factoring the survey was established. The basis for the factoring was four categories of vanpools:

1. A cordon vanpool, as described above, that had eight or more regular passengers;
2. A vanpool with eight or more regular passengers that crossed the Beltway but was not carrying eight on the day of the count;
3. A vanpool with eight or more regular passengers that did not cross the Beltway; and
4. A van that did not have more than eight regular passengers.

To factor, the sample (respondents) and the population (vanpools) must both include Type 1, 2, and 3 vanpools, and not include Type 4 vans. The factoring process was as follows:

1. As determined by the Beltway cordon count, 927 cordon vanpools crossed the Beltway on a given day. From the sample, 541 responses were found to be cordon vanpools. From these two numbers, a regional cordon factor was determined, 1.71 (population = 927 and sample = 541).
2. There were additional vanpools that had eight or more regular passengers but would not be counted in the cordon definition. This number, 42, was factored to the population using the regional factor (1.71), and the population was expanded accordingly (population = 999 and sample = 583).
3. The vanpools that did not cross the Beltway were then added to the population. For some employer-sponsored vanpools, the total number of vans was known and was added for the population total. For the other vans not crossing the Beltway, the regional factor was applied to determine the number of vans not crossing the Beltway (population = 1,073 and sample = 631).
4. The final step was to remove from the sample and population any van that did not have eight or more regular passengers. This reduced both the sample and population and created the final data base used for survey analysis (population = 1,054 and sample = 625).

With the population and sample both containing the same types of vanpools, factors were established for each sector.

Response and Error of Estimates

As did the 1982 survey, the 1989 survey experienced a high response rate (59 percent). This value is at the far upper end of the range of response rates that may be expected from mail-back surveys. Because 41 percent of those surveyed did not respond, there is a possibility of some nonrespondent bias.

As in any survey, parameter values are estimates of true values for the population, and some error is associated with the estimation procedure. For parameters expressed as proportions for the entire region, values will have an error of ± 0.025 , assuming binomial values of .5 and .5. In most cases the error will be less.

FINDINGS

Number of Vanpools

The 1982 study estimated the number of vanpools operating in the Washington region to be 667. The 1989 survey indicated

that there were 1,058 vanpools, an increase of 391 vans, or 59 percent. Table 1 shows the numbers by state of origin.

The definition of vanpool used in 1982 was a van having seven or more occupants on the day of the survey; in 1989 the definition was a commuter van with eight or more regular members. Only minor differences resulted from the change of definition.

Passengers and Occupancies

The survey asked that van drivers report the actual occupancy of their van on an average day (the last Tuesday, Wednesday, or Thursday that the van traveled). Table 2 indicates that 12,152 passengers (including drivers) traveled in 1,058 vanpools on an average day. This yields an average regional occupancy of 11.48 passengers, slightly lower than the 1982 occupancy of 11.7. The occupancy factors that were used in the Beltway, metropolitan core, and D.C. core cordon counts were slightly different because of differences in the populations studied.

Total vanpool membership was also explored. Table 2 indicates that 14,084 commuters were regular vanpool members. Thus, on an average day, 86 percent of total members actually traveled in the van. Figures 1 and 2 depict the frequency distribution of average daily passengers and regular pool members. It can be seen that the most common occupancy level was 12 average daily passengers. A pool membership of 15 was by far the most common level, reflecting the prevalence of the 15-seat van.

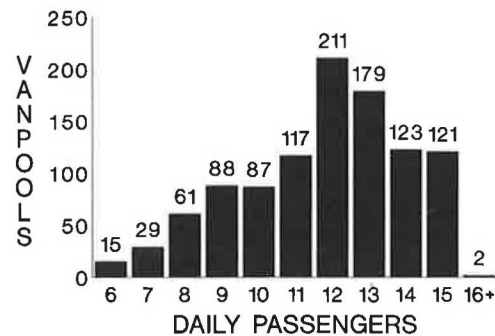


FIGURE 1 Average daily passengers.

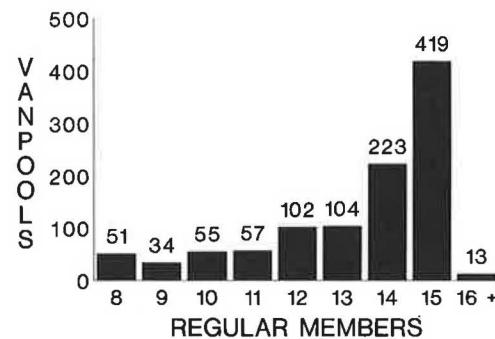


FIGURE 2 Regular vanpool membership.

Origins and Destinations

Table 1 indicates that 420 vanpools (40 percent) originated in Maryland, 633 (60 percent) in Virginia, 3 in West Virginia,

TABLE 1 NUMBER OF VANS BY STATE OF ORIGIN

ORIGIN STATE	1982 VANS	1989 VANS	PERCENT CHANGE
D.C.	0	2	--%
Maryland	238	420	+76%
Virginia	429	633	+48%
W Virginia	0	3	--%
TOTAL	667	1,058	+59%

and 2 in the District of Columbia. Figure 3 is a map showing vanpool origins by county. The map represents the extent of the Washington commuter shed and indicates the long distances traveled by many vanpools. Most vanpool travel was radial and followed seven principal travel corridors: Shirley Highway, I-66, and Route 7 in Virginia; and I-270, I-95, US-50, and Route 5 in Maryland. Prince William County had by far the most vanpools originating, with more than 300.

Vanpool destinations, as in 1982, were largely in the metropolitan core employment area (downtown D.C. and the Rosslyn, Crystal City, and Pentagon portions of Arlington). Table 3 indicates that 887 (84 percent) of vans were destined to the metropolitan core, which compares with 82 percent in the 1982 survey.

Figure 4 shows vanpool passengers traveling to the core and some peripheral areas, by employment area. Federal Triangle had the most passengers, followed by Southwest, Faragut Square, and Crystal City. Figure 5 shows passengers destined to noncore sites.

TABLE 2 PASSENGERS AND OCCUPANCIES (AVERAGE DAY)

ORIGIN STATE	1989 VANS	PASSENGERS	AVG. OCC.	MEMBERSHIP
D.C.	2	22	11.00	22
Maryland	420	4,818	11.47	5,621
Virginia	633	7,274	11.49	8,402
W Virginia	3	38	12.67	39
TOTAL	1,058	12,152	11.48	14,084

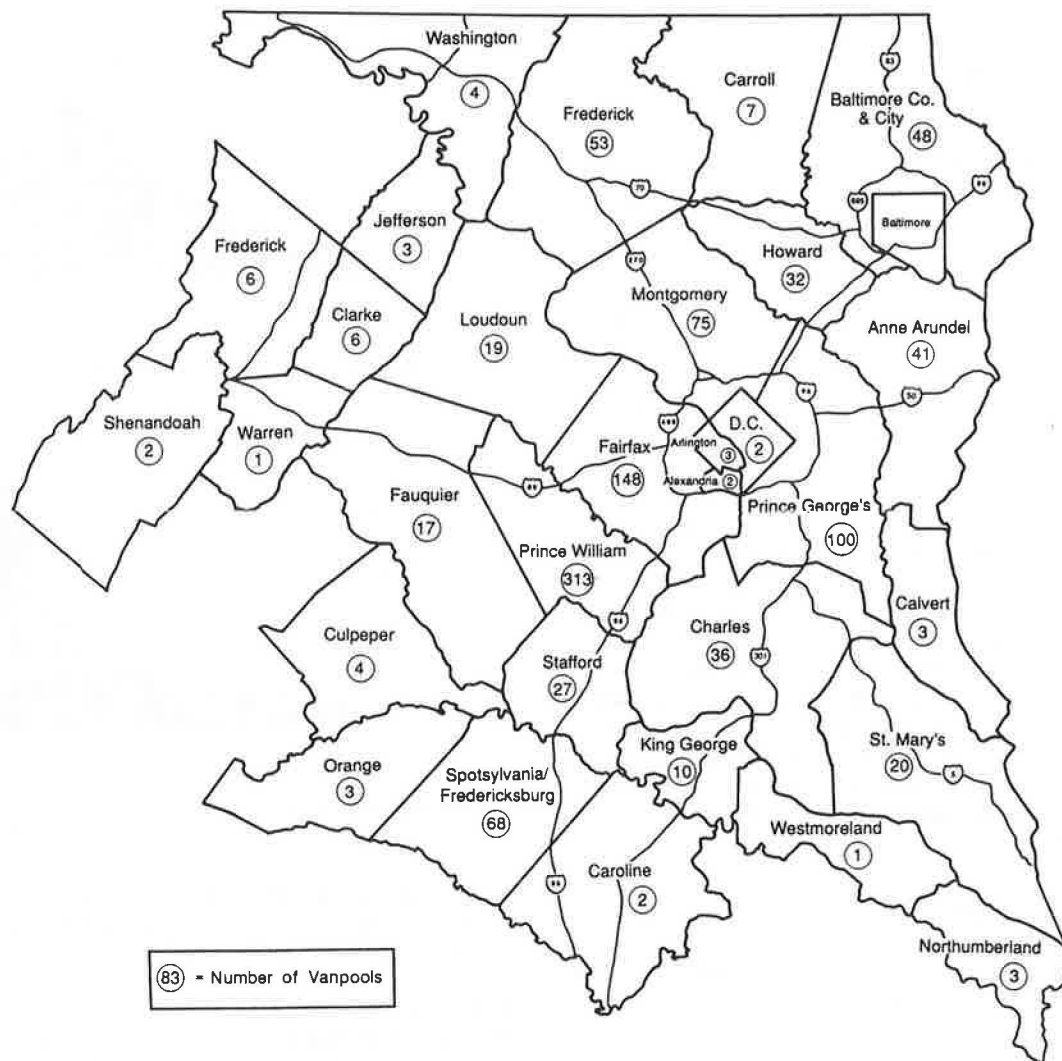


FIGURE 3 Vanpools by county of origin.

TABLE 3 NUMBER OF VANS BY FINAL DESTINATION

DESTINATION	1989 VANS	PERCENT
D.C. Core	643	61%
Arlington Core	244	23%
Subtotal Metro Core	887	84%
Inside the Beltway (not in core)	111	10%
Outside the Beltway	60	6%
TOTAL	1,058	100%

Trip Lengths and Travel Times

Vanpool drivers were asked to estimate their door-to-door commuting distances and travel times. As Figure 6 indicates, vanpools in 1989 continued to serve primarily the long-distance travel market. Only 1.2 percent of vanpools had less than a 10-mi one-way trip.

The average one-way trip length was 37.2 mi. Trip lengths were analyzed by state of Beltway crossing. The analysis had the effect of sorting vanpools according to whether they used high-occupancy vehicle (HOV) lanes; most Virginia vans did, and most Maryland vans did not. The average trip length for vanpools crossing the Beltway in Maryland was 38.5 mi; for Virginia vans, 36.5 mi.

Respondents were also asked to provide their door-to-door morning commuting time, which presumably includes some time for assembly. The average of the times was 62.4 min for all vanpools. The average travel time was 62.2 min for vanpools with a Maryland origin and 62.5 min for vanpools with a Virginia origin.

Values for vanpool trip distance and travel time have changed little from 1982, when the average distance was 36.3 mi and the average time was 58.8 min.

Collection and Distribution

At one time, it was thought that the model for carpool and vanpool operations was that the driver traveled to the homes

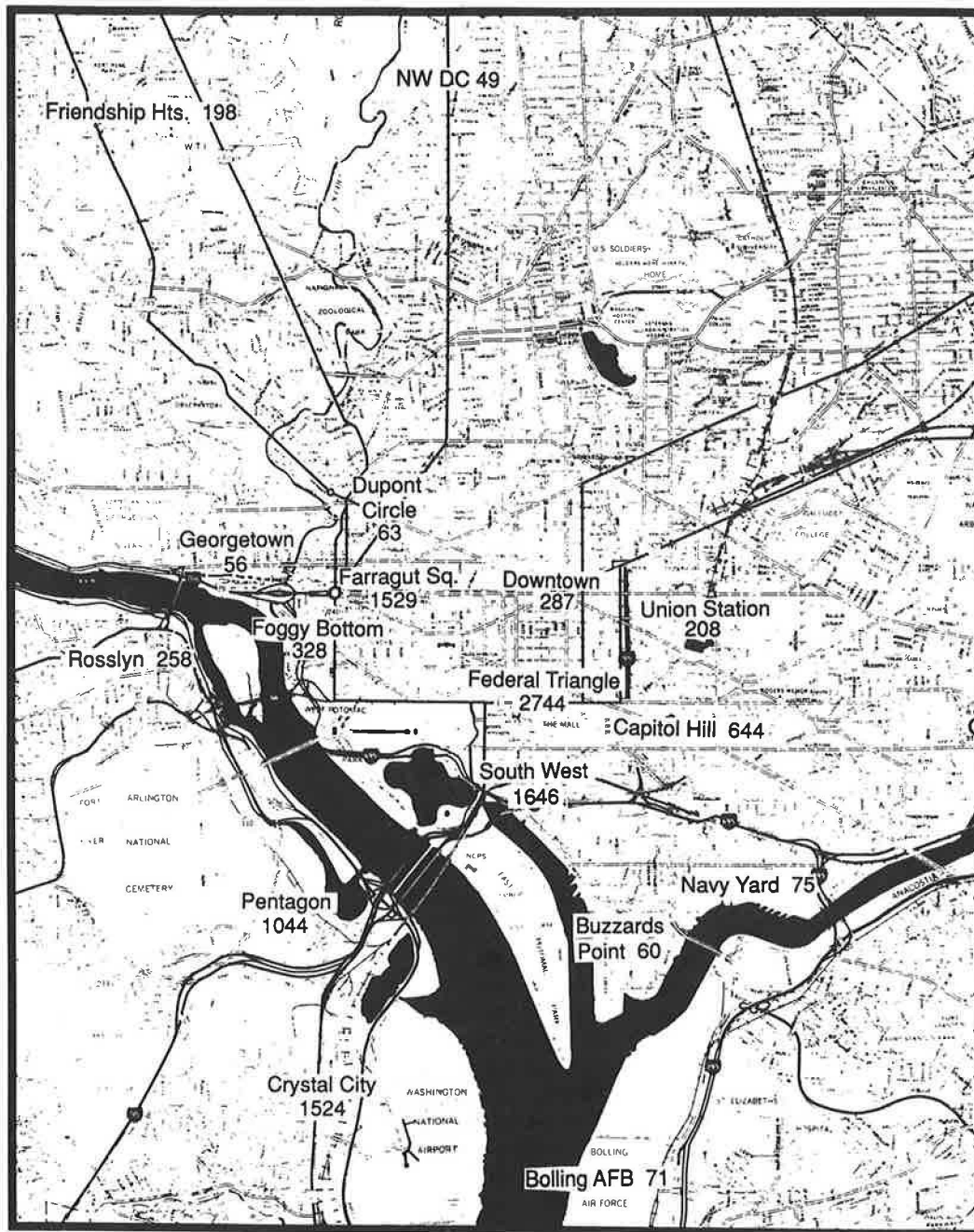


FIGURE 4 Passengers by destination (D.C. and core).

of all passengers for morning pickup, made the trip line-haul, and delivered all passengers to a single work destination. The results of this survey indicate that a different operating plan has evolved for most vanpools.

As can be seen from Table 4, less than 2 percent of vanpools picked up all passengers at home. The predominant means of assembly (66.3 percent) was for the van to stop at several meeting places, although 32.0 percent met at only one place. The typical morning assembly method, therefore, was for the van to drive to one or several meeting places and pick up passengers who had driven there. The availability of adequate

park-and-ride lots was clearly a key element for vanpool operations.

Passenger distribution at the workplace was studied as well. Survey respondents were asked to specify the employment areas where their van dropped off passengers. These were coded during the survey processing to include only areas that were geographically distinct from each other. Table 5 indicates that, in 1989, more than one-third (35 percent) of vans visited more than one employment area to drop off passengers. This is an increase from 30 percent in 1982. Some vans visited three or even four areas. Because many of these drop-

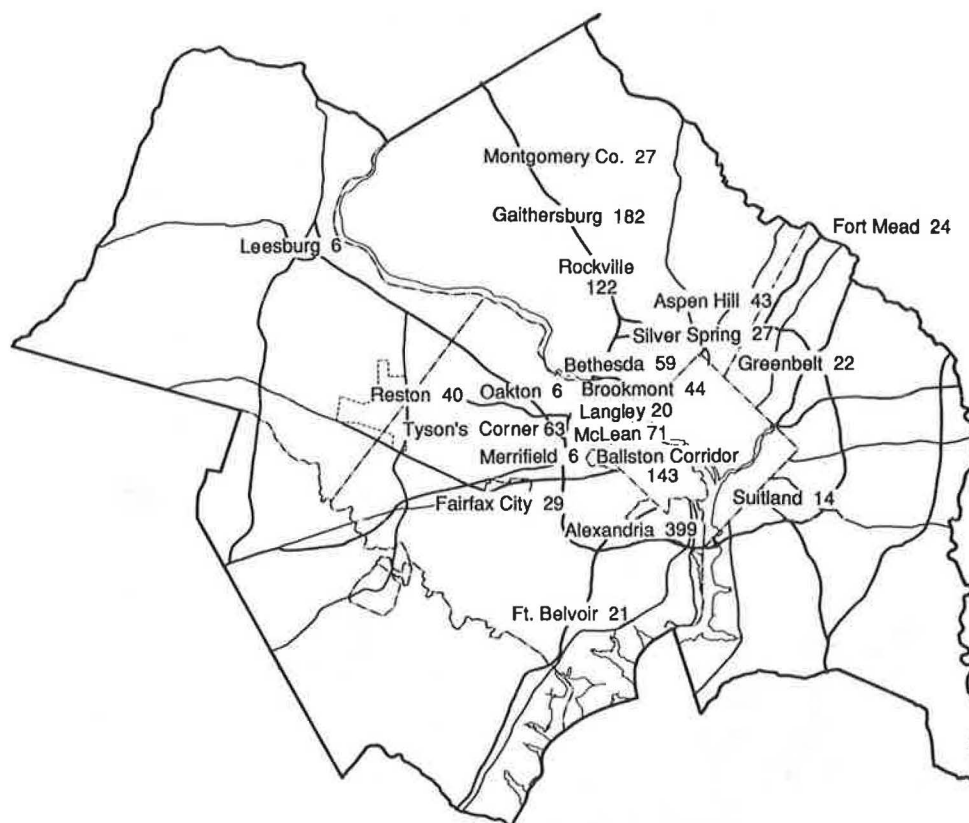


FIGURE 5 Passengers by destination (noncore).

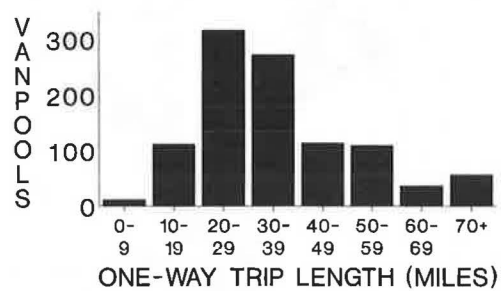


FIGURE 6 One-way trip length.

TABLE 4 VANPOOL MORNING ASSEMBLY METHOD

METHOD	1989		1982	
	VANS	PERCENT	VANS	PERCENT
Pick up at home only	18	2 %	45	7 %
Pick up at one meeting place	337	32 %	193	29 %
Pick up at several meeting places	699	66 %	425	64 %
TOTAL	1,054	100 %	663	100 %

TABLE 5 VANPOOL WORKPLACE DISTRIBUTION METHOD

METHOD	1989		1982	
	VANS	PERCENT	VANS	PERCENT
Drop off in one employment area	694	65 %	389	71 %
Drop off in two employment areas	284	27 %	136	25 %
Drop off in three employment areas	70	7 %	20	4 %
Drop off in four employment areas	10	1 %	3	1 %
TOTAL	1,058	100 %	548	100 %

offs (and pickups in the evening) were at curbside, there was a possibility of conflicts with peak-period traffic. There may, therefore, be a need for designated drop-off-pickup areas at major employment sites.

Van Insurance

Insurance is a matter of considerable concern to vanpool operators, and the survey asked for total annual insurance paid. More than half of those responding did not answer this question, many because they did not own the van they operated and therefore did not know the insurance cost. For the 469 operators who did respond, the average insurance paid was \$1,307 annually. The range of annual insurance rates was from \$358 to \$11,000. The median was \$1,200.

Equipment

The survey queried operators about the type of van that they used for their pool. Figure 7 indicates that the 15-seat van was by far the most common, constituting 83 percent of vans. In fact, the reported 14-seat vans are probably also capable of holding 15 occupants.

Figure 8 indicates that 72 percent of vans were of Dodge manufacture, followed by Ford, Chevrolet, and other makes. When van make was cross-tabulated with ownership of van, 60 percent of nonleased vans were Dodges and 34 percent were Fords. For leased vans 87 percent were Dodges. This difference was because the principal leasing firm, Vanpool Services, Inc., leased primarily Dodge equipment.

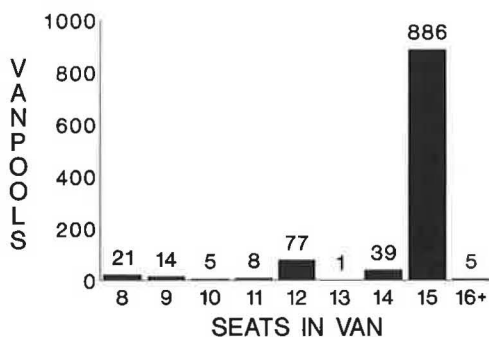


FIGURE 7 Van size.

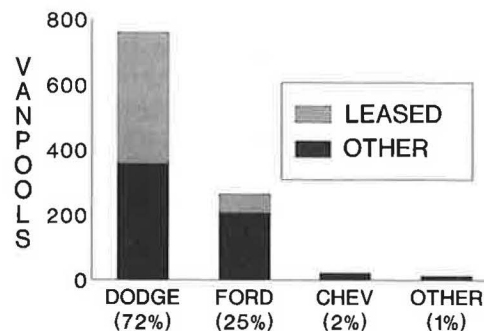


FIGURE 8 Make of vans by owner.

Figure 9 indicates that more than 80 percent of the vans had privacy windows, silvered or dark glass for passenger privacy. This was significant because it necessitated the development of special traffic-monitoring techniques to determine occupancies.

Van Ownership

Respondents were asked who owned the van they operated. Table 6 indicates that leasing companies had ownership of more vans than any other group, with a 44 percent share. This represents a change from 1982, when leasing companies had a 23 percent share. In 1982, 64 percent of vans were owned solely or in part by "self or family member," declining to 37 percent in 1989. The decline in individual ownership is probably attributable in part to the difficulty of acquiring insurance.

Issues of Concern

The survey asked vanpool operators to rank their concerns for the issues listed in Table 7 on a scale of 1 to 5. "More

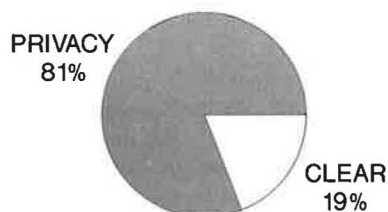


FIGURE 9 Type of van windows.

TABLE 6 VAN OWNERSHIP

OWNERSHIP TYPE	1989		1982	
	VANS	PERCENT	VANS	PERCENT
Self, Family, or with Partner	388	37 %	425	64 %
Leasing Company	460	44 %	156	23 %
Employer	109	10 %	51	8 %
Individual Outside Family	78	7 %	26	4 %
Other	21	2 %	6	1 %
TOTAL	1,058	100 %	664	100 %

TABLE 7 CONCERNS OF VANPOOL OPERATORS

1989 ISSUE AND RANK	1989 AVERAGE SCORE	NUMBER OF 5 SCORES	LEASED VANS RANK	OWNED VANS RANK	1982 RANK
1. More HOV Lanes	4.00	598	1	1	(1)
2. Parking At Work	3.41	416	2	4	(3)
3. Insurance	3.13	325	7	2	(2)
4. Operating Costs	3.30	294	4	3	-
5. Finding New Riders	3.27	288	3	5	(5)
6. Access To Parking Garage	2.90	272	5	7	(8)
7. Van Servicing	2.93	223	6	6	(4)
8. AM Meeting Place	2.06	84	8	8	-
9. PM Pickup Place	1.70	56	9	9	-
10. Competition	1.64	36	10	10	-

HOV lanes" and "parking at work" were the highest-scoring concerns, with ranks of 4.00 and 3.41, respectively. "P.M. pickup place" and "competition" were the lowest-scoring concerns. Only 56 and 36 operators, respectively, scored them at 5, and their average scores were 1.70 and 1.64, respectively.

The priority of concerns has remained fairly consistent, as can be seen by comparing the current rank order with that from the 1982 survey shown in the far right column. "HOV lanes" topped the list in both 1982 and 1989.

When the 1989 respondents were categorized by type of van ownership, some differences emerged. Specifically, insurance, which is covered by the lessor for most leased vans, was in second place for operators who own their vans and dropped to seventh position for leased-van operators.

DISCUSSION OF FINDINGS

Vanpooling is a fast-growing mode primarily serving long-distance commuter travel. It increased 59 percent from 1982 (667 vans) to 1989 (1,058 vans), and occupancies have remained at about 11.5 passengers since 1982. About 12,200 people vanpool to work daily. Regionally, about 1,570,000 people are estimated to commute to work each day in the region, and vanpools carry about 0.8 percent of these.

If specific segments of the commuting market are considered, vanpooling has an even larger impact. It is estimated that daily commuters to the downtown metropolitan core totaled 450,000 in 1989; vanpoolers to the core in 1989 totaled 10,300,

or 2.3 percent of core commuters. By comparison, in 1989, commuter bus and commuter rail each carried about 5,000 passengers daily to the core, or half the number of vanpool passengers.

To segment the commuting market even more finely, travel from Prince William County to the core can be considered. This represents long-distance travel via two corridors with HOV lanes to a work destination with a high parking cost—an optimal situation for vanpooling. It is estimated that, in 1989, 17,300 commuters traveled from Prince William to the core on an average day. The vanpool survey found that about 3,140 vanpoolers in 270 vans commuted from Prince William to the core. Therefore, 18 percent of the Prince William-to-core commuter travel was by vanpool, a sizeable share of that market.

Vanpooling is an extremely efficient mode for long-distance commuters: the survey indicated that an average of 11.5 passengers traveled in one vehicle, and each vehicle occupied little more space in traffic than a full-sized automobile. In addition, the mode has started and grown in the Washington area with virtually no financial assistance from the public. It is of considerable interest whether vanpooling can capture commuters in the short-haul market—those who travel 10 mi or less to work each day. The survey indicates that this has not yet begun to occur: in 1989, the average one-way vanpool trip length was 37 mi, and about 1 percent of vanpoolers traveled 10 mi or less.

State and local governments have been interested in how best to encourage further growth in vanpooling. Incentive

programs are being offered in Maryland by Montgomery and Prince George's counties and in Virginia by the Northern Virginia Transportation Commission, the Virginia Department of Transportation, and Prince William County. These programs offer various financial incentives for vanpool start-up. The strongest incentive that the public could offer appears to be continuation and expansion of HOV-lane policies; this has been the chief issue for vanpool operators in both the 1982 and 1989 vanpool surveys. It is notable that the Northern Virginia 2010 Transportation Plan includes a significant HOV-lane element, and that an HOV-lane alternative is being considered by the Maryland Department of Transportation for the Route 29 corridor in Montgomery County.

A final issue of public concern is insurance. Elsewhere in the nation, vanpooling is often organized by employers, or by a third party such as a ridesharing program or van-leasing company. In Washington, a different model has evolved: the owner-operated van. In 1982, 64 percent of Washington region vans were owner operated. This decreased to 37 percent in the 1989 survey. In 1985, owner-operated vans were deeply affected by a major liability insurance crisis. The basic insurance needed for operation became, for many, either unavailable or very expensive. As a result, many vanpools went out of service, and it is reasonable to assume that vanpooling would have grown more in the 1982–1989 period if the insurance crisis had not occurred. Other operators decided to switch to leased vans because lessors were able to provide insurance. Leasing grew from 23 percent in 1982 to 44 percent in 1989.

Leasing has become an attractive alternative to outright ownership, and there are many positive features of leasing besides availability of insurance. One concern is that currently only one major firm provides vanpool-leasing services, with a consequent constraint on alternatives and market competition. If vanpool operators could own their vans without fear that insurance will become unavailable or exorbitantly priced,

a much more "level playing field" would result, and the attractiveness of this mode should be increased. Availability of fairly priced insurance is therefore an issue of continuing importance for vanpooling.

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