COMMUTER CONNECTIONS
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National Capital Region Transportation Planning Board COMMUTER CONNECTIONS PROGRAM

2020 Vanpool Drivers Survey Technical Survey Report

Prepared for:

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ABSTRACT

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ABOUT COMMUTER CONNECTIONS
Commuter Connections, a program of the National Capital Region Transportation Planning Board at the Metropolitan Washington Council of Governments (COG), promotes bicycling to work, ridesharing, and other alternatives to drive alone commuting, provides ridematching for carpools and vanpools, incentive programs for alternative commuting, and offers the free Guaranteed Ride Home program. Commuter Connections is funded by the District of Columbia, Maryland, Virginia and U.S. Department of Transportation.

CREDITS
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TABLE OF CONTENTS

SECTION 1 – INTRODUCTION

The Metropolitan Washington Council of Governments (COG) is the regional organization of the Washington area's major local governments and their governing officials, plus area members of the Maryland and Virginia legislatures and the U.S. Senate and House of Representatives. The National Capital Region Transportation Planning Board (TPB), the federally-designated Metropolitan Planning Organization (MPO) for Washington, DC and the surrounding areas of Maryland and Virginia, directs the continuing comprehensive transportation planning process. The TPB includes representatives from the local jurisdictions, plus the state legislatures, the three state transportation agencies, the District of Columbia Office of Planning, the Metropolitan Washington Airports Authority, the Washington Metropolitan Area Transit Authority, and five Federal agencies. Staff of COG serves as the staff of the TPB.

COG also serves as a primary provider of regional transportation demand management (TDM) information and services to commuters through its Commuter Connections program. Commuter Connections is a network of transportation organizations dedicated to assisting commuters to find commute options to and from work, other than driving alone. In an effort to improve the effectiveness and efficiency of these services, COG performs periodic evaluations. One of these services is assistance to vanpools, particularly in the formation of vanpool groups. A vanpool is a group of five to 15 commuters traveling to and from work together in a passenger van. The vanpool occupants might include passengers who are dropped off at other worksites or companies before reaching the final destination worksite.

To provide information that can serve both of these planning and evaluation functions, COG has undertaken the vanpool driver study described in this report to examine vanpooling practices in the Washington DC region. The 2020 study represents the fifth vanpool study for the Washington region. COG previously conducted similar vanpool studies in 1982, 1989, 2002, and 2008.

The 2020 survey was administered through an email/postal mail invitation sent to vanpool drivers and coordinators who had registered in a vanpool database maintained by COG or by one of several other organizations that support vanpools traveling to and within the Washington metropolitan region. All interviews were self-administered through an Internet website. Respondents who received the email invitation were provided a clickable link directly to the survey website. Several follow-up reminder emails were sent to respondents in the email group who did not respond to the initial or subsequent emails.

This report details the survey and sampling procedures and provides highlights of the survey results. Note that because the survey was administered only to registered vanpools, it does not necessarily represent all vanpools that operate in the region. Vanpools that do not register could have different characteristics and experiences than do registered vanpools.

This report is divided into three sections. Following this introductory section is a description of the survey and sampling methodology (Section 2). A presentation of survey results is contained in Section 3. Following these sections, three appendices present copies of the questionnaire and survey invitation emails.

SECTION 2 – SURVEY AND SAMPLING METHODOLOGY

Overview

The 2020 survey was administered through an email mail invitation sent to vanpool drivers and coordinators who had registered in a vanpool database maintained by COG or by one of several Commuter Connections network member programs that support vanpools traveling in the Washington metropolitan region.

All interviews were self-administered through an Internet website. Respondents who received the email invitation were provided a clickable link directly to the survey. Several follow-up reminder emails were sent to respondents in the email group who did not respond to the initial or subsequent emails.

The primary purpose of the survey was to collect data on current vanpool operations for COG Transportation Demand Management planning purposes. The main topics in the survey included:

- Vehicle type/capacity/ownership
- Duration of the vanpool
- Origin and destination of the vanpool
- Pick-up and drop-off locations
- Vanpool formation and total trip time and distance
- Vanpool services provided by employer and other organizations
- Vanpool issues of concern to drivers
- Interest in autonomous vans and electric/hybrid vans

Sample Selection Process

COG/TPB staff provided the research team with three databases of vanpool driver/coordinator records for the study. These included a database maintained by COG's Commuter Connections program as well as two other Commuter Connections network organizations that offer vanpool services in Virginia. The starting counts of records in each database were as follows:

- Commuter Connections (503 records)
- GWRideConnect (365 records, 171 for which driver contact could be obtained)
- OmniRide/Vanpool Alliance (557 records)

The database for the GWRideConnect vanpool program included numerous vanpool operators who oversaw multiple vans. In these cases, the only available contact information in the database was for the operator; contact for individual drivers was not included. These multi-van operators accounted for 285 of the total 365 vans in the GWRideConnect database. GWRideConnect staff requested that these operators provide contact names and information for the individual drivers and coordinators so they could be included in the survey. Three of the operators, which managed a total of 91 vanpools, provided driver/coordinator information. When these records were added to the individual driver/coordinator records in the GWRideConnect database, this database provided a total of 171 usable driver/coordinator records.

The research team examined the Commuter Connections, GWRideConnect, and OmniRide databases and eliminated duplicate records, when they could be identified. If a vanpool driver was listed in multiple databases, the records were examined and only one was kept. Items for comparison included first and last name, phone number, and home and work addresses. In addition, the research team inspected the list for minor differences that would result in duplicate records. Much of the inspection involved a visual scan of the records since duplicate cases could differ through only a slight difference in spelling, spacing, use of abbreviations, etc.

Note also that the databases provided by the different organizations included different types of information and not all of the databases included sufficient contact or location information to ensure that duplicate records could be identified across databases. For example, the OmniRide/Vanpool Alliance database included only a driver/coordinator name and email address. Thus, it is possible one of the other databases could have included a record for

that vanpool under a different contact name, but there was no way to identify all duplicates. The final database, after all duplicates were removed, included a total of 1,161 records.

One additional vanpool database that was requested by COG/TPB staff was the driver/coordinator database maintained by Commute With Enterprise. Commute With Enterprise leases a large number of vans in the Washington metropolitan region and COG and the research team had expected that this database would be made available for merging into the combined database. Commute With Enterprise chose not to make driver information available, thus it was not possible to integrate Commute With Enterprise vans in the deduping step. However, Commute With Enterprise agreed to send an email to each of its drivers, requesting that they participate in the survey. A total of 475 vanpool drivers were contacted via this method.

Questionnaire Design and Testing

The questionnaire used for the 2020 survey was based on the 2008 survey instrument. Some minor adjustments were made to reflect changes in vanpooling in the Washington metropolitan region since the last vanpool survey was conducted and small changes in wording and formatting were made to allow the questionnaire to be self-administered by respondents via an Internet website. COG and the research team also added several new questions to examine vanpool interest in two topics of current relevance: autonomous vehicles and electric/hybrid vehicles. The questionnaire also noted that COG was offering a drawing for three $100 Amazon gift cards for drivers/coordinators who completed the survey.

COG/TPB staff, LDA Consulting, and CIC Research jointly prepared the questionnaire, which was reviewed by the Commuter Connections TDM Evaluation Group. A copy of the final questionnaire is provided in Appendix A. The research team programmed the survey questionnaire for Internet administration and conducted testing to ensure correct and efficient flow of the survey. COG staff also conducted tests of the online survey program.

Survey Administration

COG/Commuter Connections Sample File

After finalizing the questionnaire and preparing the merged sample file, the research team sent the sample list and the survey invitation letter to COG for distribution. The sample file contained the names and contact information for records for which an email address was available. Each sample record also included a unique survey ID that would be inserted into the email as a clickable link to the survey website. The unique ID also served the purpose of prohibiting respondents from taking the survey multiple times.

COG staff merged the survey file with the alert letter and distributed the letters via email to the 1,161 records in the file. A copy of the survey invitation email is provided in Appendix B. Over a period of three weeks, COG staff sent three reminder emails to potential respondents who had not yet responded to the survey. A total of 240 completed interviews were obtained from the COG sample file.

Enterprise Vanpool Sample File

As noted earlier, Commute With Enterprise agreed to participate in the survey by sending an email to drivers in its database. Because the research team did not have individual driver information, it was not possible to assign a unique survey link for these drivers. Thus, the Enterprise email invitation provided a survey website link that was the same for all Commute With Enterprise drivers. To provide a way to distinguish Commute With Enterprise respondents from COG respondents, the database in which completed Commute With Enterprise interviews were stored was separate from that of the COG interviews.

The research team anticipated that the Commute With Enterprise database could overlap substantially with the merged COG database. To minimize the possibility that a driver who was in both databases might respond twice, the email to Commute With Enterprise drivers was not sent out until COG had already sent the third reminder email. Additionally, the survey invitation sent to Commute With Enterprise drivers clearly and boldly stated that the driver might have received emails from COG/Commuter Connections regarding the same survey and that they

should not complete the survey a second time if they had already responded to the COG emails. Appendix C provides a copy of the Commute With Enterprise invitation.

Commute With Enterprise staff sent survey invitations to 475 drivers. They also sent one reminder email to drivers. A total of 128 drivers responded to one or the other of these invitations. Following the completion of the Enterprise component of the survey, the research team combined the COG and Commute With Enterprise completed interviews into one database and examined the records for duplicates between the two survey components. Seven records were flagged as definite or highly likely duplicates and were removed from the database. This resulted in a total of 121 remaining records from the Commute With Enterprise sample file.

A total of 361 surveys were completed, either through the COG or Commute With Enterprise email requests. Because it is likely the two starting sample frames overlapped, but it is not possible to know by how much, the research team was not able to calculate the response rate. However, the response rate likely was 20% or higher. Assuming no overlap in the samples, the total unique invitations would have been 1,636 (1,161 from COG and 475 from Enterprise). The total 361 interviews divided by 1,636 invitations would result in a response rate of 22%. If duplicates between the two sample files could have been eliminated, the starting sample would have been smaller than 1,636, resulting in a correspondingly higher response rate.

Relation of Vanpool Survey Respondents to Regional Vanpool Population

In the vanpool surveys conducted in 2002 and earlier years, the Washington DC area Beltway Cordon Count was used to develop an estimate of the total vanpool population for the study area. The number of completed questionnaires from vanpool drivers whose vans crossed the Beltway on the travel to work was expanded to equal the number of vans that had been observed crossing the Beltway cordon. This expansion factor was then used also to estimate the total number of vans operating in the region.

COG has not conducted a Beltway Cordon Count since 2001 and comparable cordon count statistics were not available in 2008 or in 2020. Thus, it was not possible to estimate either the number of vanpools in the Washington metropolitan region or the distribution of vanpools throughout the region.

It is also important to reiterate that the sample for these surveys included only vans that had registered with COG's Commuter Connections program. It is likely that some vans, perhaps many, non-registered vans also operate in the area. Note also that two of the vanpool databases used to develop the starting sample frame in 2020 included only vanpools that operated in Virginia (GWRideConnect and OmniRide), thus, it also is likely that the vanpool survey results overrepresent vanpools in Virginia and underrepresent vanpools that operate entirely in Maryland and/or the District of Columbia. For this reason, the results of this survey should be assumed only to document the characteristics of registered vans and the vanpools in the survey sample; they are not necessarily representative of the entire regional vanpool population.

SECTION 3 SURVEY RESULTS

This section presents the survey findings. As noted in Section 2, the sampled vanpools were not expanded to represent the entire vanpool population in the Washington metropolitan region. Thus, the findings shown in this section are presented for the frequencies of respondents and represent only responses for the registered vanpools in the sample frame. The raw numbers of respondents who answered each question are shown as (n=___).

The survey collected data in four primary topic areas. Results for these topics are presented below:

- Van ownership and operation
- Vanpool use and travel patterns
- Availability and use of vanpool assistance and support services
- Issues of potential concern to vanpool drivers

Van Ownership and Operation

The first section of the survey examined physical and ownership characteristics of the van and duration of the vanpool group.

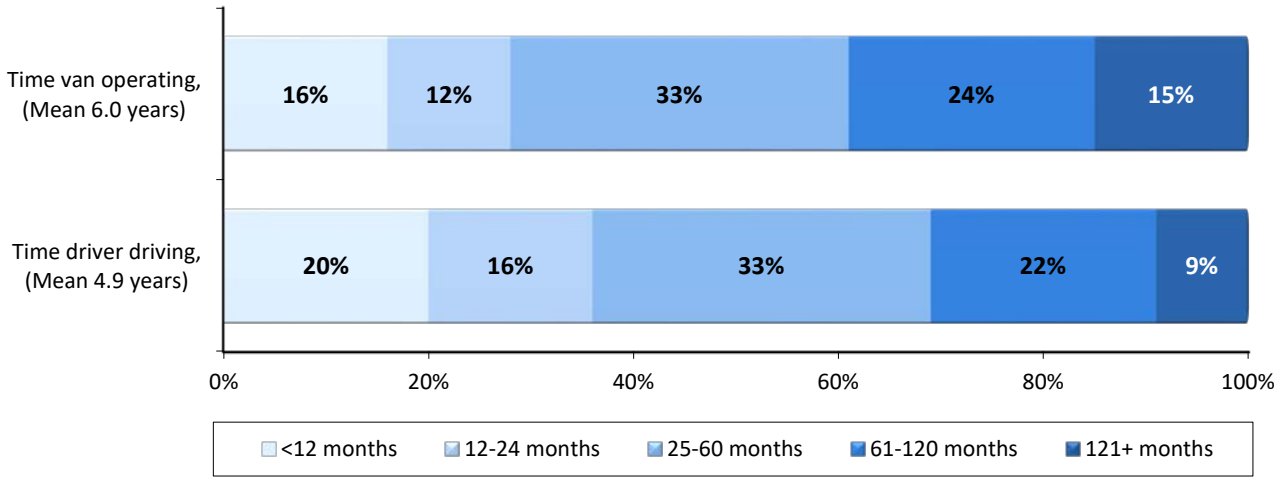
Length of Time Vanpool in Operation and Length of Time Driving the Vanpool

Figure 1 details the results to two questions about vanpool longevity. First, how long has the vanpool been in operation, and second, how long has the driver been driving this vanpool group?

Duration of Vanpool Operation – Vanpools in the survey had been in operation an average of 6.0 years. This was a considerably shorter time than the 9.9 years measured in the 2008 survey and the 8.4 years measured in 2002. This could suggest growth in vanpooling over the past 12 years, since the last survey was conducted. As more new pool arrangements enter the vanpool fleet, the average vanpool duration would decline.

Three in ten vanpools were relatively new; 28% had been in operation for two years or less. One third (33%) had been operating for between 25 months and 60 months (5 years). Four in ten vanpools had been in operation for more than five years, with 15% in operation for more than 10 years.

Figure 1
Length of Time Vanpool in Operation and Length of Time Driver has been Driving
(Vanpool duration n = 313, Driver duration n = 300)



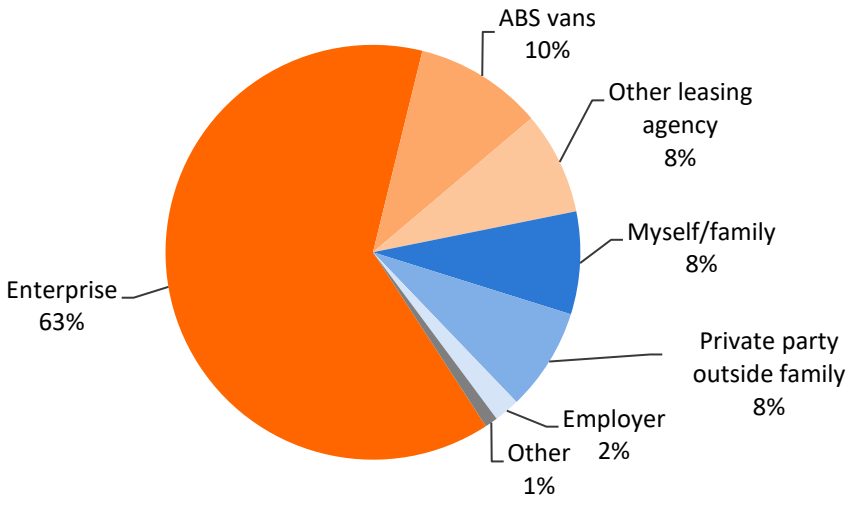
Duration of Driving – Figure 1 also displays the length of time the current drivers had been driving the vanpool. About two-thirds (63%) of the respondents said they were the primary driver and 25% said they served as a backup driver. Twelve percent said they did not drive the van; they served as coordinators for the vanpool. Respondents who drove had been driving their vans for an average of 4.9 years. This was less than the duration observed in either 2008 (6.0 years) or 2002 (6.4 years). But since the average vanpool duration fell between 2008 and 2020, it is logical that the average driver tenure also would have declined since 2008.

More than one-third (36%) of drivers had been driving for two years or less and one-third (33%) had been driving for between 25 months and 60 months. Three in ten respondents had been driving for more than five years. One in ten (9%) had been driving more than ten years.

Van Ownership

Respondents were asked who owned the van they operated. More than eight in ten (81%) respondents said their vanpool used a van they leased from a leasing company (Figure 2). Nearly two-thirds (63%) mentioned Commute With Enterprise as the leasing organization, 10% reported leasing their vans from ABS Van Rentals, and 8% named another van leasing agency. One in ten (8%) drivers said they owned the vans or that it was owned by a family member and another 8% said it was owned by a private party outside their family. Two percent used a vanpool provided by the employer and 1% mentioned another owner.

Figure 2
Distribution of Van Ownership
(n = 355)



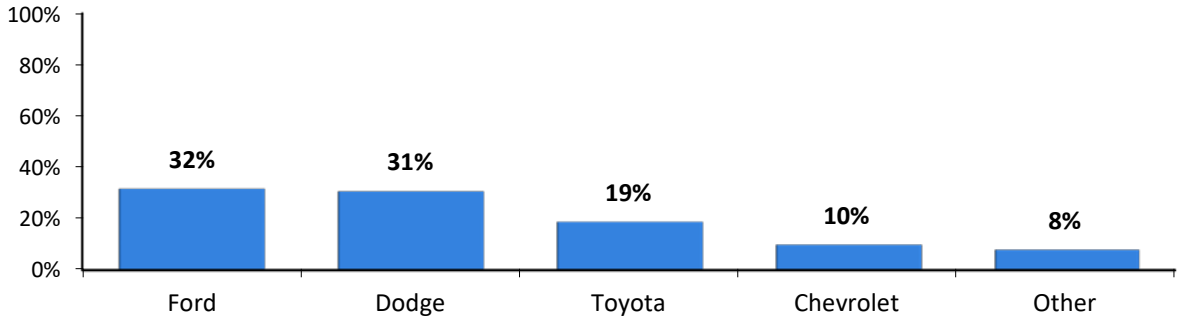
The 2020 survey results represented a substantial departure from the results of the 2008 survey. In 2008, only 53% of respondents named a van leasing agency as the owner; four in ten said their vans were owned either by the respondents themselves or a family member (20%) or by a private party outside the family (20%). The much higher share of leased vans in 2020 could indicate some shift away from personal or private ownership.

Note, however, that while Commute With Enterprise is known to be a major source of van leasing in the region, Commute With Enterprise also assisted with the survey, sending the survey invitation email to the driver/coordinator contact for each of the vans they lease. ABS Van Rentals also assisted with survey outreach to its registered drivers. Thus, Commute With Enterprise and ABS vans could be over-represented in the sample. Numerous other small organizations each manage a few vans in the region, and it was not possible to obtain contact information for individual drivers of these organizations. This gave the research team no viable way to include these vanpools in the survey, unless they appeared in one of the other databases that were used to compile the sample frame. These combined factors could have skewed the sample toward leased vans.

Manufacturer and Model Year of Vehicle

Van Manufacturer – Respondents named nine different manufacturers for the vans they used, but three accounted for more than eight in ten of the overall vans (Figure 3). One-third (32%) drove a Ford van, 31% drove a van made by Dodge, and 19% dove a Toyota van. One in ten (10%) used a van made by Chevrolet. The remaining 8% of respondents drove another make of van.

Figure 3
Van Manufacturer
(n = 347)



The 2020 range of van manufacturers was quite different from the 2008 survey results. In 2008, Ford dominated, with three-quarters (76%) of respondents naming this as their van's manufacturer. About one in ten drove a Dodge and one in ten drove a Chevrolet. Since 2008, Ford has declined notably as the van choice, Dodge has tripled its share of the regional vanpool market, and Toyota, which was used by less than one percent of vanpoolers in 2008, grew dramatically.

Van Model Year – The model year of the vans varied from 2020 as the most recent year to 1998 as the oldest van model year, but vans were generally relatively new, with an average age of 2.5 years old. Nearly eight in ten (78%) of the vans were model year 2017 or later (Table 1).

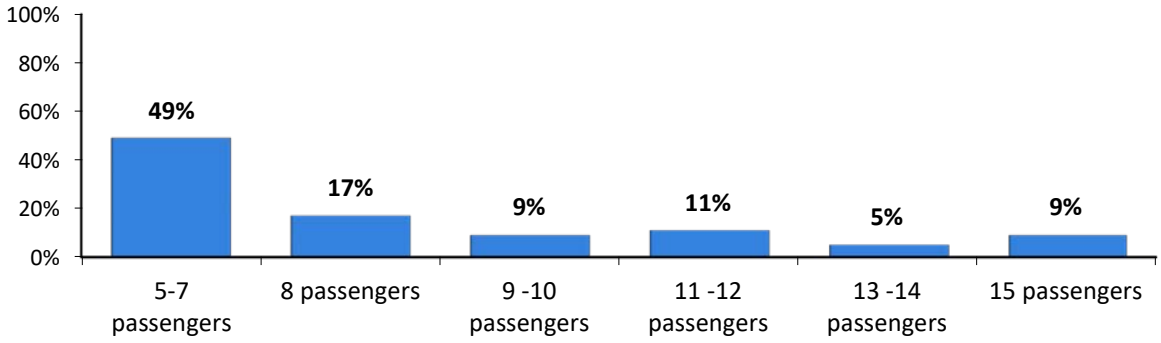
Table 1
Model Year of Van
(n = 328)

Van Model Year	Percentage	Cumulative Percentage
2020	5%	5%
2019	46%	51%
2018	20%	71%
2017	7%	78%
2016	8%	86%
2015	5%	91%
2014	2%	93%
2013	2%	95%
2012 or earlier	5%	100%

Van Capacity

Respondents were asked how many passengers could be carried in the van, including the driver, if every seat was filled. Van capacity ranged from a low of five people to a high of 15 people, with an average capacity, including the driver, of 8.9 people. The most common vans, by far, were "minivans," carrying eight or fewer passengers; 49% of the vans had a capacity of between five and seven passengers and 17% carried eight passengers (Figure 4). Two in ten carried between nine and 12 passengers. Only 14% of the vans were traditional commuter vans, with capacity for 13 to 15 passengers.

Figure 4
Van Seating Capacity
(n = 357)



The 8.9-person average van capacity in 2020 was dramatically lower than the 13.8-person average occupancy measured in the 2008 vanpool survey. The steep drop was due to a shift from traditional 15-passenger commuter vans to smaller vans. In 2008, 81% of the vans in the survey carried 14 or 15 passengers and only 8% were minivans. These proportions had nearly flipped in the 2020 survey, with traditional vans of 13 or more persons comprising just 14% of the vans and minivans with eight or fewer occupants accounting for 66% of the total vans.

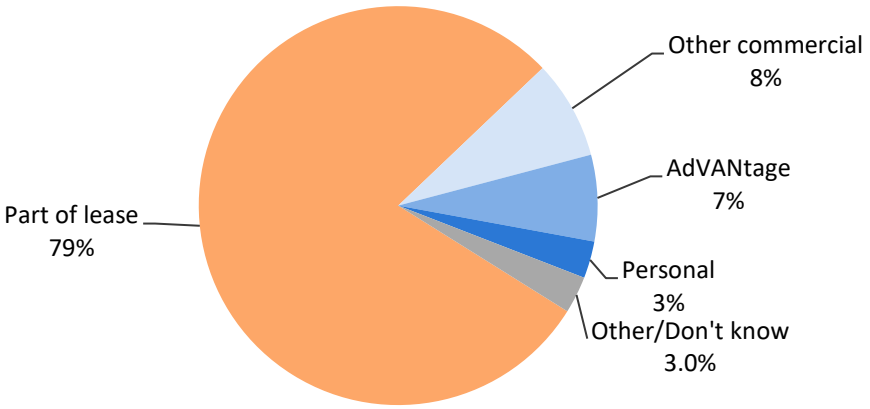
Type of Van Insurance and Who Pays Insurance

The survey asked two questions related to van insurance. What type of insurance do you have and who pays for the insurance?

Who Pays Insurance Cost – Nearly eight in ten respondents (79%) said their insurance cost was included in the lease cost. Another 16% said the owner of the van paid for the insurance. Only 5% paid for the insurance directly.

Type of Insurance – As shown in Figure 5 and as noted above, 79% of respondents had insurance through their van lease. Presumably, these policies would be commercial policies, but 8% said the van was covered by another commercial policy. Seven percent participated in the AdVANtage Vanpool Self-Insurance Program offered to vanpools that operated in Virginia. Three percent were covered by personal insurance and 3% carried another type of coverage or did not know what type of insurance they carried.

Figure 5
Person Responsible for Paying Insurance
(n = 361)



Vanpool Use and Travel Patterns

A second section of the questionnaire asked about vanpool occupancy, origin and destination, number and locations of passenger pick-up and drop-off locations, and travel distance and time. Results for these questions are described below.

Usual Vanpool Size and Vanpool Size on Wednesday Prior to the Survey

Usual Size – The survey asked vanpool drivers how many people, including the driver, "usually" rode in the vanpool, that is the total number of people who were part of the vanpool group. The average number of people, including the driver, who usually rode in the vanpool was 6.7 people (Table 2). This was 2.2 persons lower than the average van capacity of 8.9. Nearly eight in ten (79%) usually had eight or fewer passengers. Only 5% said they usually carried more than 10 passengers.

Table 2
Number of People in the Vanpool
Van Capacity, Usual Number, and Number on Previous Wednesday
(Van capacity n = 357, "Usually ride" n = 356, "Rode Previous Wednesday" n = 320)

Van Model Year	Van Capacity Percentage	"Usually Ride" Percentage	"Rode Last Wednesday" Percentage
4 or fewer people	0%	12%	30%
5 – 7 people	49%	57%	51%
8 people	17%	10%	8%
9 – 10 people	9%	16%	9%
11 – 12 people	11%	4%	2%
13 – 15 people	14%	1%	0%
Mean (average)	**8.9**	**6.7**	**5.7**

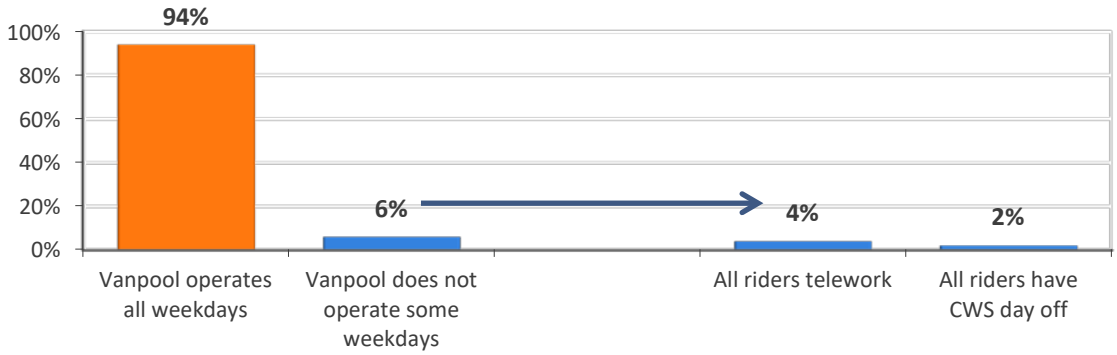
Riders "Last Wednesday" – Respondents also were asked how many people rode in their vanpool on the Wednesday prior to the survey. The last column of Table 2 shows these results. This question examined the actual number of people who would be likely to ride on a typical day, recognizing that some absenteeism is to be expected. On average, 5.7 people, including the driver, rode in the van that day. This indicates that the average absenteeism rate was about 1.0 people, compared to the 6.7 people who "usually rode" in the van.

Thirty percent of respondents said their van carried fewer than five people on the previous Wednesday and 89% said they had eight or fewer riders that day. Only one in ten (11%) respondents reported van ridership of nine or more that day.

Weekdays Vanpool Does Not Operate

The 2020 survey added a new question asking if there were any weekdays (Monday through Friday) when the vanpool did not operate and if so, why the vanpool did not operate. Nearly all (94%) of respondents said their vanpool did operate every weekday (excluding holidays) (Figure 6). Six percent said the vanpool had one or more weekday off per week; 4% said all riders teleworked from home that day and 2% said all riders worked a compressed work schedule (CWS) with the same CWS day off.

Figure 6
Vanpool Operates All or Some Weekdays
(n = 360)



The 21 respondents who said the vanpool did not operate all weekdays were asked which day or days did the vanpool NOT operate. The most common day off, by far, was Friday; 85% (18 of the 21 respondents) said the vanpool did not operate on this day. About one in ten respondents named each of the other days of the week: Monday (15%), Tuesday (10%), Wednesday (10%), Thursday (10%). Note that respondents were permitted to choose more than one day, so the total of the percentages by day will add to more than 100%.

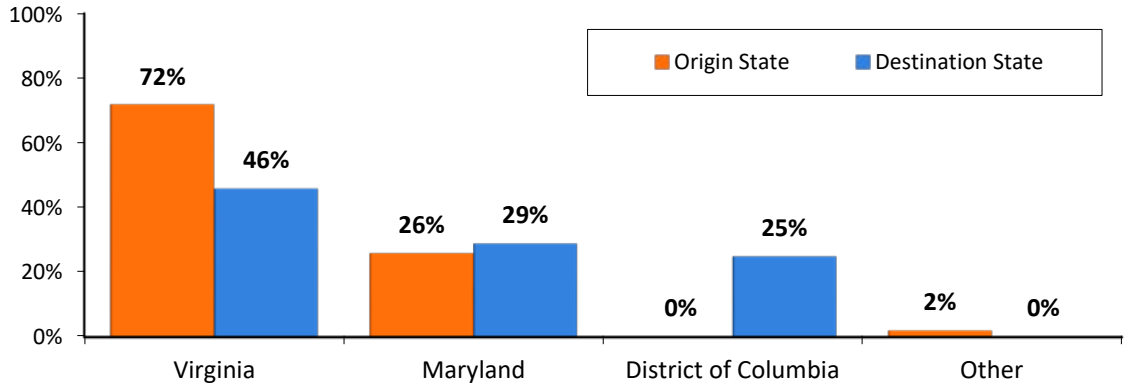
Vanpool Origin and Destinations

States of Origin and Destination – More than seven in ten (72%) of the vanpools originated in Virginia (Figure 7). One-quarter (26%) said their vanpools originated in Maryland. A small number (2%) of vanpools originated in another state, such as Pennsylvania or West Virginia.

The figure also shows the distribution of vanpools by destination state. More than four in ten (46%) respondents said their vanpools were destined for Virginia. The remaining vanpools were about evenly split between Maryland (29%) and the District of Columbia (25%).

The domination of Virginia as a vanpool origin and destination extends far into the past. For example, in 2008, 76% of the vanpools surveyed originated in Virginia and 36% were destined for this state. Note, however, that both the 2008 and 2020 survey samples included several databases for vanpool programs offered only in Virginia. Thus, the predominance of Virginia in the 2020 survey could be related in part to the sample frame.

Figure 7
Vanpool Origin and Destination States
(Origin n = 359, Destination n = 316)



State to State Vanpool Trips

Table 3 presents the percentages of vanpool trips made within and between states. Nearly six in ten (57%) of the vanpool trips did not cross a state boundary; 16% both started and ended in Maryland and 41% were wholly within Virginia. The primary state-to-state trips included Virginia to District of Columbia (20%) and Virginia to Maryland (12%). All other state-to-state movements represented just one in ten of the total trips.

Table 3
Vanpool Origin and Destination State Flows – Percentage of Total Trips
(n = 314) *

	Destination State (Percentage of total Trips)			
Origin State	**DC**	**Maryland**	**Virginia**	**TOTAL**
DC	0%	0%	0%	**0%**
Maryland	4%	16%	5%	**25%**
Virginia	20%	12%	41%	**73%**
Other	1%	1%	0%	**2%**
TOTAL	**25%**	**29%**	**46%**	**100%**

* Note that the state totals in Table 3 might not match the state totals in Figure 7 because some respondents did not provide both origin and destination information.

Counties of Origin and Destination – Table 4 shows the origin and destination counties mentioned most frequently. The top two origin counties were located in Virginia: Spotsylvania/Fredericksburg (19%) and Stafford (15%). Four additional Virginia counties each accounted for at least 6% of the total origins: Fairfax (8%), Prince William (8%), Loudoun (7%), and Warren (6%). The top origin counties in Maryland included Frederick (7%), Montgomery (3%), and Prince George's (3%).

Table 4
Distribution by Origin/Destination Jurisdiction
(Origin n = 361, Destination n = 364)

Origin/Destination County/State	Origin Percentage	Destination Percentage
District of Columbia	0%	25%
Virginia Counties/Cities		
Alexandria City	1%	3%
Arlington County	0%	11%
Culpeper County	2%	0%
Fairfax County	8%	28%
Fauquier County	2%	0%
King George	0%	2%
Loudoun	7%	1%*
Prince William County	8%	1%
Spotsylvania County (incl Fredericksburg)	19%	0%
Stafford County	15%	0%
Warren County	6%	0%
Other Virginia	6%	1%
Maryland Counties		
Anne Arundel County	1%	3%
Baltimore County	2%	0%
Charles County	2%	0%
Frederick County	7%	0%
Howard County	2%	0%
Montgomery County	3%	20%
Prince Georges County	3%	4%
Washington County	2%	0%
Other Maryland	2%	1%
Other	1%	0%

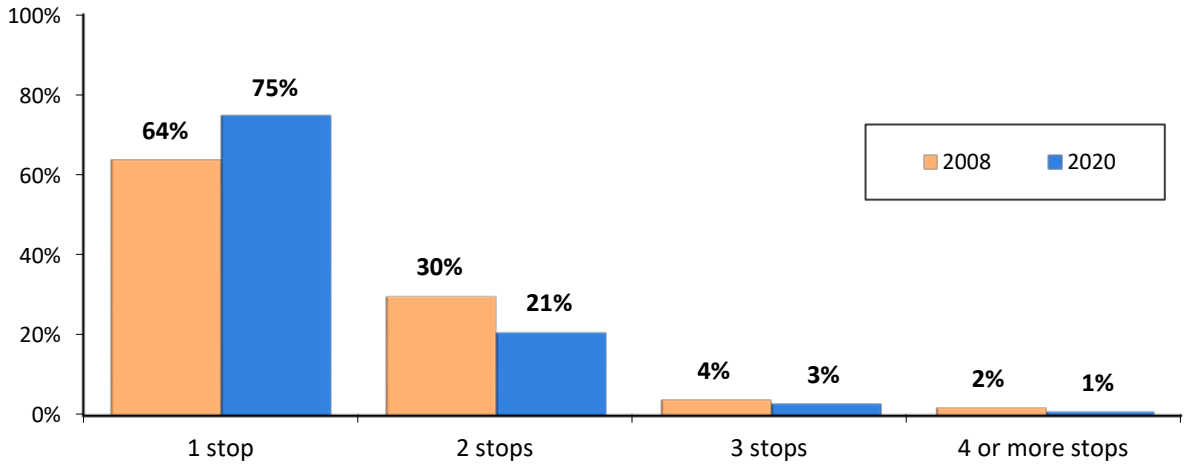
* Less than 0.5%.

The District of Columbia accounted for 25% of the vanpool destination. Two Virginia jurisdictions, Fairfax (28%) and Arlington (11%), accounted for four in ten of the vanpool destinations. One Maryland county, Montgomery (20%), accounted for another two in ten of the destinations.

Number of Vanpool Stops to Pick-up and Drop-off Passengers

Pickup Stops – Three-quarters (75%) of the 2020 vanpools made only one stop at a central meeting place to pick up passengers in the morning (Figure 8). Two in ten (21%) of the vanpools made two stops and the remaining 4% made three or more stops to pick up riders. The share of vanpools that made more than one pick-up stop was slightly lower in 2020 (25%) than in 2008 (36%). This could reflect the smaller average vanpool size in 2020; a vanpool with just eight riders might be able to aggregate all needed riders in one location, while a larger vehicle might need more stops to fill the vehicle.

Figure 8
Number of Rider Pickup Stops Made by Vanpool in the Morning – 2008 and 2020
(2008 n = 405, 2020 n = 361)



Drop-off Stops – Two-thirds (66%) of respondents said that all passengers worked at the same location, so that only one drop-off stop was made at the final vanpool destination. The remaining 34% said they made at least one additional drop-off stop before parking the van. This result was nearly the opposite of the pattern in 2008. In 2008, only 28% said all vanpool riders worked at the van's daytime parking destination; 72% of vanpools made at least one drop-off stop before reaching the final destination.

Vanpool Collection, Line-Haul, and Distribution Time

The survey asked detailed questions about the timing of the morning vanpool trip, including the time at which the driver leaves home to start the trip, the time the van leaves the last passenger pick-up stop, the time the van arrives at the first passenger drop-off stop, and finally, the time the van is parked for work.

Vanpools in the survey operated at very early commuting hours. Three-quarters (76%) of the vanpool drivers said they left their homes to start the vanpool trip before 6:00 am (Table 5). Vanpool pickup times also were quite early, with eight in ten (81%) of the vanpools making their last pickup stop before 6:30 am.

Passenger drop-offs were clustered between 5:30 am and 7:29 am; 76% of the vanpools had their first (or only) drop-off during this two-hour period. Nine in ten (90%) of the vans were parked at work before 8:00 am, but more than four in ten (41%) vanpools were already parked at work before 6:30 am.

Table 5
Vanpool Trip Start, Pickup, Drop-off, and End Times

Morning Time	Vanpool Morning Activity (Percentage of Vanpools)			
	Driver Leaves Home (n = 314)	Van Leaves Last Pickup Stop (n = 333)	Van Arrives First Drop-Off Stop (n = 339)	Van Parked for Work (n = 338)
Before 5:00 am	33%	18%	3%	2%
5:00 am – 5:29 am	21%	19%	6%	4%
5:30 am – 5:59 am	22%	22%	15%	13%
6:00 am – 6:29 am	13%	22%	23%	22%
6:30 am – 6:59 am	4%	10%	18%	21%
7:00 am – 7:29 am	2%	4%	20%	20%
7:30 am – 7:59 am	2%	2%	6%	8%
8:00 am or later	3%	3%	9%	10%

Using the time data provided by vanpool drivers for various morning activities, it was possible to estimate the time vanpools spent in several morning activities.[1]

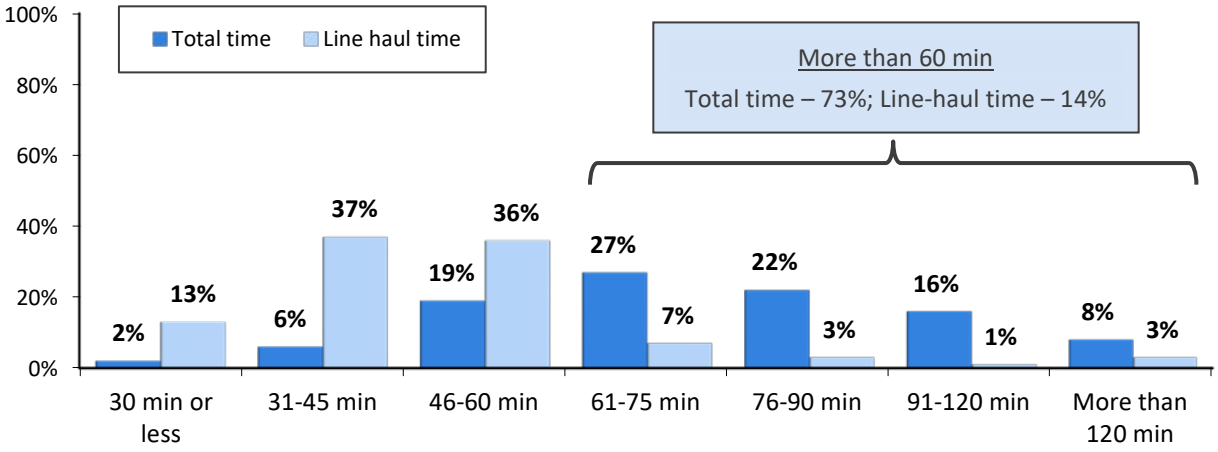
- Overall driver travel time from home to the workplace
- Vanpool "line haul" time, when all riders were in the vehicle
- Vanpool rider pickup (collection)
- Vanpool rider drop-off (distribution)

Total Driver Travel Time – Figure 9 shows the distribution of total travel time for the vanpool trip, from the time the driver left home in the morning to the time he or she parked the van for work. The average total travel time was 79 minutes. About one-quarter (27%) of vans traveled one hour or less. Another 27% traveled between 61 and 75 minutes and 22% traveled between 76 and 90 minutes. Nearly one in ten (8%) of vans traveled more than two hours.

Line-haul Time – Figure 9 also displays the distribution of the "line-haul" time, the portion of the vanpool trip in which all riders were in the van. This time equals the total time for the driver, minus the time spent picking up and dropping off riders. Nearly three-quarters (73%) spent between 31 and 60 minutes in the line-haul portion of the trip. The line-haul time was 30 minutes or less for 13% of the vans and more than one hour for 14% of the vans.

[1] Note that some drivers left some time periods blank or entered inconsistent times, such as an arrival at the workplace before the departure time or times with an unreasonable length of time between vanpool trip stages. In these cases, the stage time was set to unknown and the distributions and averages were calculated for respondents with known/consistent times.

Figure 9
Total Travel Time and Line Haul Travel Time
(Total time n = 307, Line-haul time n = 329)



Pickup (Collection) and Drop-Off (Distribution) Time – Table 6 presents the distributions of time the driver spent in picking-up all passengers at the start of the vanpool trip and dropping them off at their respective work destinations at the end of the trip.

Table 6
Morning Passenger Pickup and Drop-off Time
(Pickup n = 306, Drop-off n = 340)

Time	Rider Pickup Percentage	Rider Drop-Off Percentage
0 minutes (all pickup at driver's house and all drop-off at work place	6%	67%
1 – 10 minutes	11%	18%
11 – 15 minutes	18%	8%
16 – 20 minutes	16%	2%
21 – 30 minutes	27%	3%
31 – 45 minutes	12%	3%
More than 45 minutes	10%	1%
Mean – all vanpools	**25 minutes**	**4 minutes**
Mean – vanpools with 2+ stops *	**26 minutes**	**14 minutes**

* Average time for vans with pickup other than the driver's home and drop-off other than the workplace.

Six percent of respondents said all riders met at the driver's home, so the driver's pickup time was zero. Another 11% of drivers picked-up all passengers within 10 minutes of leaving their homes. One-third (34%) said it took between 11 and 20 minutes to collect all passengers and 27% reported that passenger pickup took between 21 and 30 minutes. The remaining 22% said morning passenger pickup consumed more than 30 minutes.

Passenger drop-off took less time. This was in part because two-thirds (67%) of the vans made only one drop-off, with all passengers being dropped off at the location where the van was parked for the day. An additional 28% of vans dropped off all passengers within 20 minutes; only 7% took more than 20 minutes to discharge all passengers.

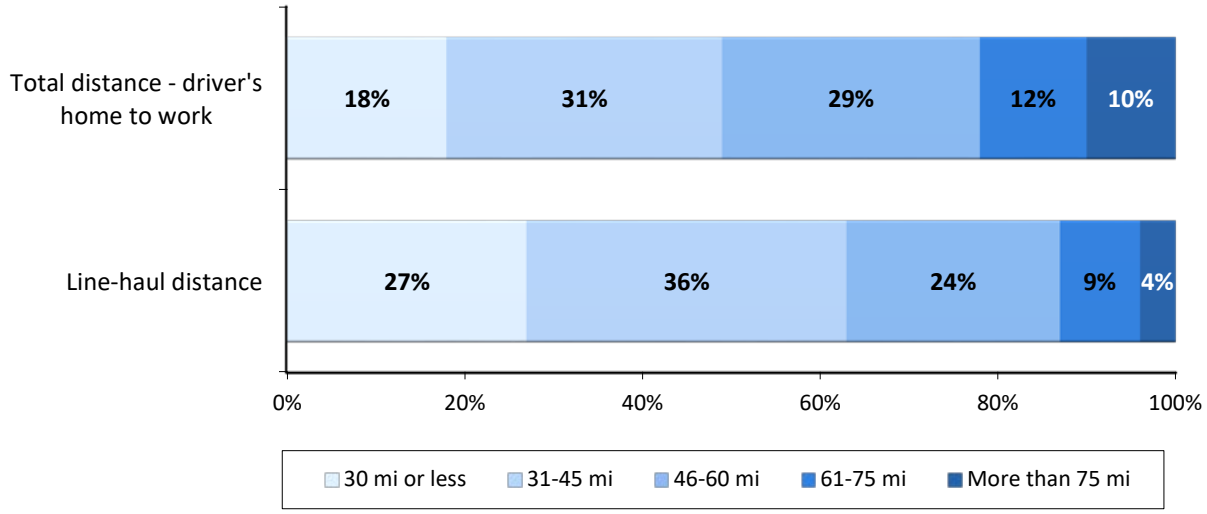
The vanpool pickup process took an average of 26 minutes for vans that picked up passengers at a location other than the driver's home. Vanpool drop-off took 14 minutes for vans that had a drop-off stop at a location prior to the worksite where the vehicle was parked. Across all vanpools in the survey, including those with 0 minutes collection time, vanpool collection took an average of 25 minutes. Across all vanpools, the distribution period consumed just four minutes, because such a large share of vans had only the worksite parking location as a distribution point; they had no distribution time at all.

As noted above, the average vanpool trip took 79 minutes. Thus, collection and distribution together totaled 29 minutes and comprised about 37% of the total vanpool trip time.

Travel Distance

The survey also asked the vanpool drivers how many miles they traveled for the total trip and for the portion of the trip between the last pickup and first-drop off stops (line-haul portion).[2] These results are shown in Figure 10.

Figure 10
Travel Distance
(Total distance n = 325, Line-haul distance n = 327)



About two in ten (18%) respondents said the total trip distance was 30 miles or less, three in ten (31%) traveled between 31 and 45 miles, and 29% traveled 46 to 60 miles. The remaining 22% traveled more than 60 miles one-way. Line-haul distances were understandably shorter; 63% had a line-haul distance of less than 46 miles and only 13% said the line-haul portion of the trip was more than 60 miles.

[2] As was noted for the travel time of various trip phases, some drivers left some distances blank or entered inconsistent distance, such as a distance from the driver's home to the workplace much shorter than the distance from the home to the first pickup location. It is likely the respondent mis-read the question. In these cases, the stage distance was imputed from the origin location and destination information provided by the driver. If location information was not available, the stage distances were set to unknown and the distributions and averages were calculated for respondents with known/consistent distances.

The average total distance from the driver's home to the work location was 47.9 miles. The average line-haul distance from the last morning pickup to the first drop-off location was 42.3 miles. The average total distance was essentially the same as had been estimated from the 2008 survey (48.6 miles). The average line-haul distance in 2020 was a few miles longer than the 39.5-mile distance estimated in 2008. As noted earlier, a smaller share of the 2020 vanpools made multiple pickup and/or drop-off stops, thus the line-haul travel miles might reasonably be a larger segment of the average trip distance.

Respondents whose trips originated in Virginia traveled an average total trip distance of 49 miles, compared to 43 miles for respondents whose trips originated in Maryland. Vanpools that traveled to the District of Columbia and Virginia traveled farther than those destined for Maryland. Average trip distances by destination states were 51 miles for the District of Columbia, 49 miles for Virginia, and 41 miles for Maryland.

Primary Vanpool Routes and Use of HOV/Express Lanes

Primary Vanpool Routes

The survey asked respondents which Interstate highways and major U.S. or state routes that they used for their vanpool trip. Table 7 presents the results for each route in Maryland/District of Columbia and in Virginia.

Table 7
Primary Routes Used by Vanpools and HOV Lanes Used
(All route n = 348, HOV route n = 342)

Primary Roadway	All Route Percentage	HOV Percentage
Virginia		
I-95 (VA)	45%	40%
I-495 – Capital Beltway (VA)	24%	16%
I-395 Shirley Highway (VA)	18%	18%
Dulles Toll Road – VA Route 267 (VA)	13%	10%
I-66 Outside the Beltway (VA)	12%	12%
I-66 Inside the Beltway (VA)	8%	6%
U.S. Route 1 – Jefferson Davis Highway (VA)	5%	----
George Washington Parkway (VA)	4%	----
U.S. Route 50 – Lee Jackson Highway (VA)	2%	----
VA Route 29 – Lee Highway (VA)	2%	----
Maryland / District of Columbia)		
I-495 – Capital Beltway (MD)	24%	----
I-270 (MD)	12%	9%
I-295 (MD/DC)	6%	----
I-95 (MD)	6%	1%
U.S. Route 29 – Colesville Road (MD)	4%	----
Baltimore Washington Parkway – U.S. Route 295 (MD)	3%	----
U.S. Route 301 (MD)	3%	----
I-695 – Southeast-Southwest Freeway (DC)	2%	----
U.S. Route 50 – John Hanson Highway (MD)	2%	1%

Nearly all (98%) respondents used at least one of the Interstates or major roadways listed. The most widely used roadway overall was the Virginia portion of I-95, south of Washington, DC. Nearly half (45%) of respondents named this road as one they used. Other common routes in Virginia included the Virginia portion of I-495 (Capital Beltway), used by 24% of vanpools, and I-395 (Shirley Highway), used by 18%. About one in ten respondents had used the Dulles Toll Road/VA 267 (13%), the portion of I-66 outside the Beltway (12%), or I-66 inside the Beltway (8%). The most common route used in Maryland was the Maryland portion of I-495 (Capital Beltway); 24% of vanpools in the survey traveled on this route. About one in ten (12%) used I-270 in Maryland. All other roadways in both Virginia and Maryland were named by 6% or less of respondents.

Use of HOV/Express Lanes

Nearly eight in ten (79%) respondents said their vanpool used an HOV lane or Express lane during the trip to work. Table 7 also showed percentages of vanpools that used each of the HOV/Express Lanes in the region. The most common HOV/Express Lane routes generally followed the pattern of major route use. In cases where the HOV percentage of use on a road was less than the total use, it is likely that some vanpools either traveled on sections of the roadways that did not have HOV/Express Lanes or traveled for such a short distance on that roadway that it was not efficient or reasonable to enter and exit the lanes for that portion of the trip.

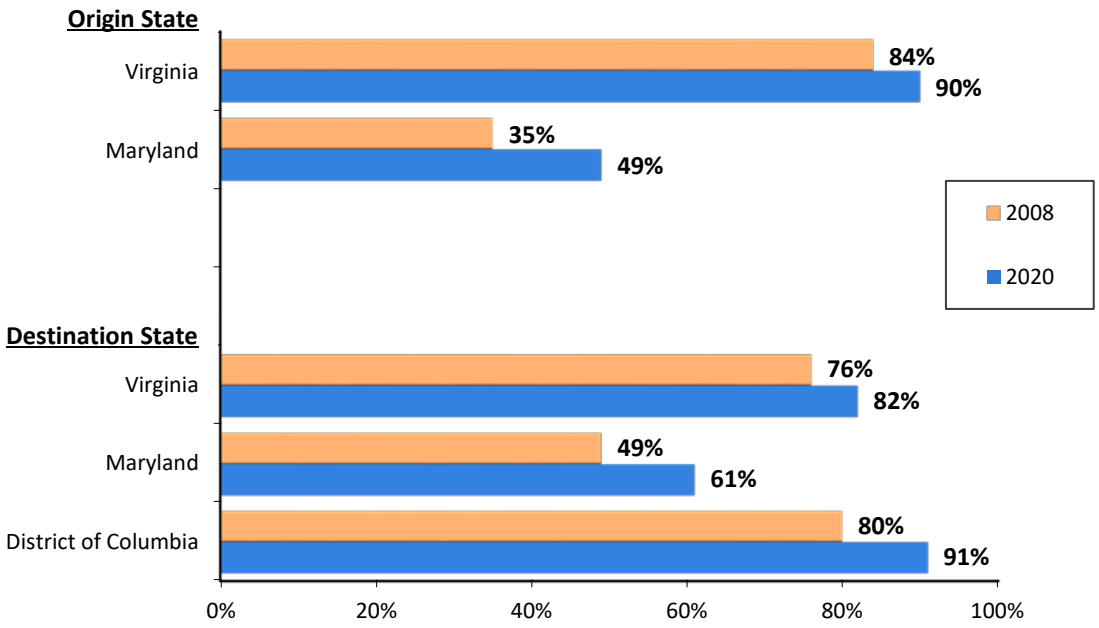
Use of HOV/Express Lanes by Origin and Destination State – Use of the lanes varied by where in the region the vanpool started and ended. As indicated by the top section of Figure 11, 90% of the vanpools that originated in Virginia used an HOV/Express Lane, compared with just 49% of the vanpools that originated in Maryland. This was almost certainly related to the greater availability of HOV and Express Lanes that existed in Virginia (I-95, I-66, I-395, I-495, and Dulles Toll Road) compared with Maryland (I-270, Inter-County-Connector, and US-50).

Figure 11
Use of HOV/Express Lane to Work by Origin and Destination State

Percentage of Vanpools That Used HOV/Express Lanes

(2008 Origin State: Virginia n = 311; Maryland n = 82)
(2020 Origin State: Virginia n = 248; Maryland n = 88)

(2008 Destination State: Virginia n = 148; Maryland n = 57; District of Columbia n = 176)
(2020 Destination State: Virginia n = 141; Maryland n = 85; District of Columbia n = 76)



Use of HOV lanes was more evenly distributed by destination state. About eight in ten (82%) of the vanpools traveling to Virginia and 91% of vanpools traveling to the District of Columbia used an HOV/Express Lane. About six in ten (61%) of the vanpools destined for Maryland used an HOV/Express Lane.

Use of HOV/Express Lanes grew for all origins and all destinations between 2008 and 2020. This likely reflects the development of new HOV/Express Lanes in both Virginia and Maryland since 2008.

Vanpool Assistance and Services

The survey also asked respondents about vanpool assistance services and benefits they received, either from their employer or another commute assistance group. Additionally, respondents were asked about parking charges they paid at their worksite.

Assistance Received when Forming Vanpool

Nearly six in ten (58%) vanpool drivers said they received some type of assistance in forming their vanpool. The remaining drivers said they did not receive assistance (41%) or did not know if their vanpool had received assistance (1%), possibly because the driver was not driving the van when it was formed. The percentage of assisted vanpools in 2020 was distinctly higher than the 44% who reported vanpool formation assistance in the 2008 survey. About half (48%) of the 2020 survey respondents said they received assistance provided by their employer and 10% received assistance from another organization (Table 8).

Table 8
Sources of Vanpool Formation Assistance
(n = 342; multiple responses permitted)

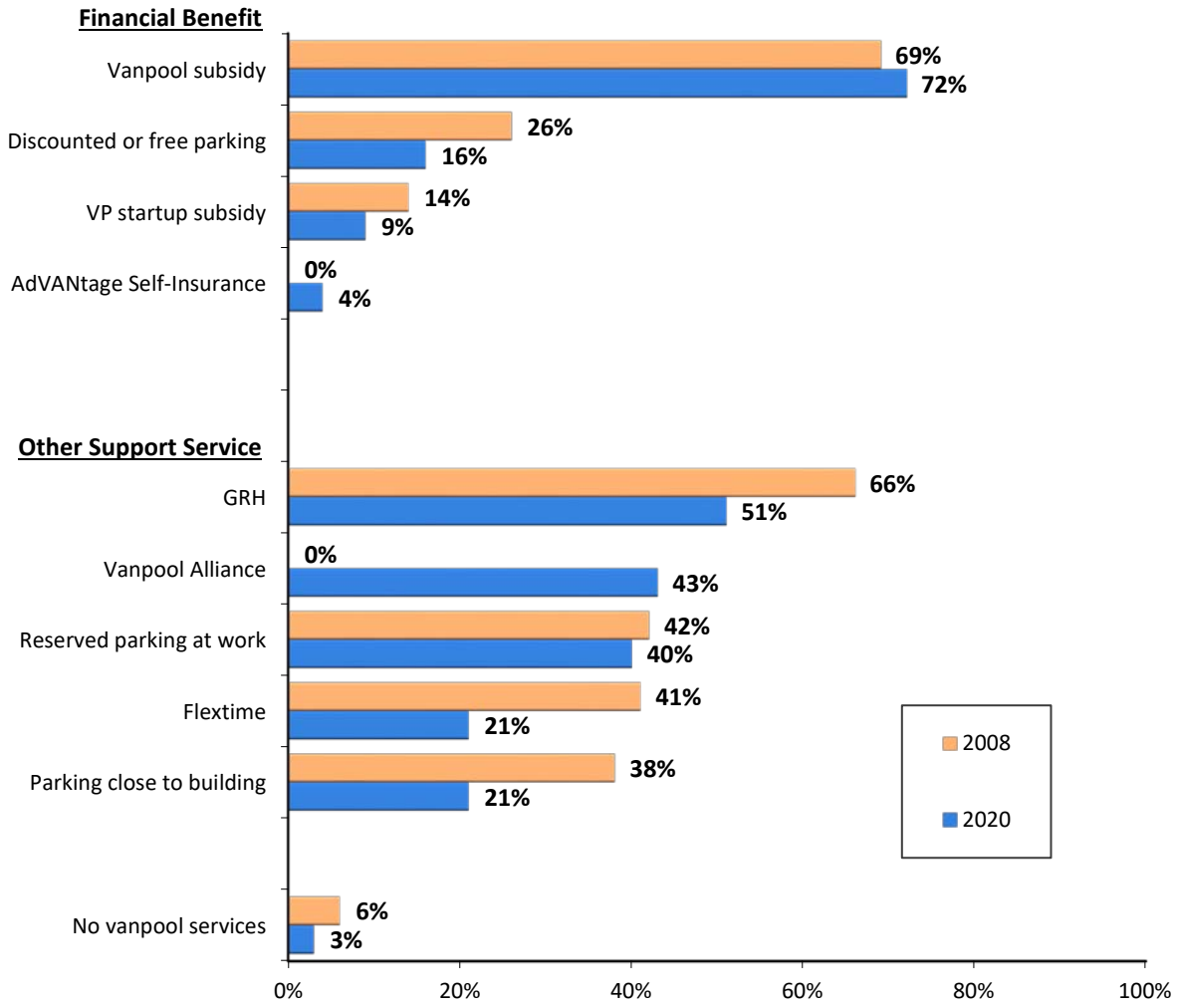
Source of Formation Assistance	Percentage
No assistance received/ don't know	42%
Employer	48%
Enterprise Vanpool	3%
Commuter Connections	1%
ABS Vans	1%
Vanpool Alliance	1%
Other	4%

This percentage of assisted vanpools likely is not representative of all vanpools operating in the region. As was noted earlier, the vanpool survey included only drivers who had registered their vanpools with one or more organizations that provide vanpool support, presumably to obtain assistance. It is likely that a larger share of non-registered vanpools did not receive assistance from one of these rideshare or vanpool organization, but it is possible that they received assistance from another entity, such as an employer.

Ongoing Vanpool Services or Benefits from Employers and Commuter Organizations

Respondents also were asked about vanpool services they or their vanpool received from an employer, commute service organizations, or local jurisdiction agencies. Nearly all (97%) respondents received one or more commute services or benefits. Availability of vanpool services and benefits was similarly high in 2008; 94% of respondents in the 2008 survey said they had received assistance. Figure 12 shows the percentages of respondents who had access to each of the listed services in 2020 and the corresponding percentages who reported these services in 2008.

Figure 12
Vanpool Services or Benefits Received
(2008 n = 408, 2020 n = 338, multiple responses permitted)



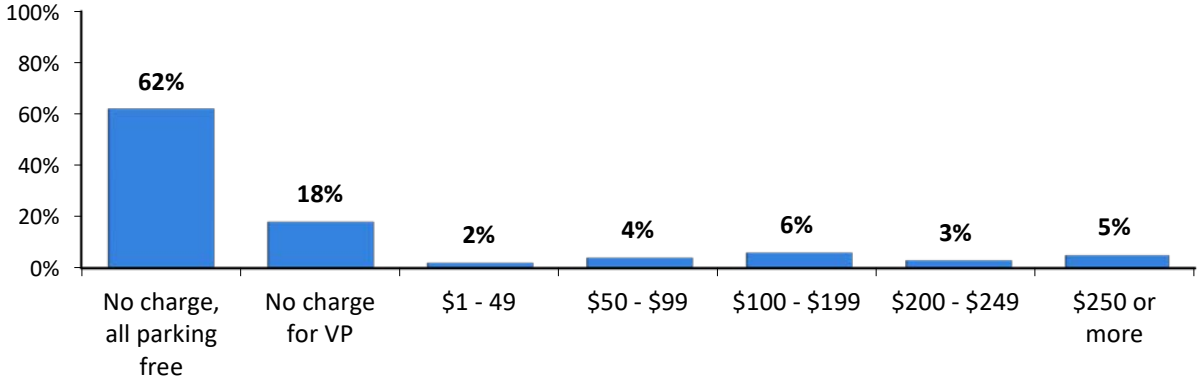
The most common service in 2020 was a vanpool subsidy, received by 72% of vanpools. About half (51%) of the respondents said they had access to a Guaranteed Ride Home program. Four in ten mentioned that they participated in the Vanpool Alliance program available to Virginia vanpool (43%) and a similar share said their employer offered reserved parking at work for vanpools (40%). Two in ten reported that their employers offered flextime (21%), parking close to the building (21%), and/or discounted or free parking for vanpools (16%). One in ten (9%) had received a vanpool start-up subsidy and 4% cited the AdVANtage Self-Insurance program offered in Virginia.

Figure 12 also shows the percentages of vanpools that said each of the services was available in 2008. The vanpool subsidy was the top service in that year also and was available at about the same rate as in 2020. Reserved parking and vanpool start-up subsidy also were available at about the same rate in 2020 as in 2008. But a considerably lower percentages of 2020 vanpool respondents said they had access to GRH, flextime, parking close to the building, and discounted or free vanpool parking than had noted these services in 2008. Two of the 2020 services, Vanpool Alliance and AdVANtage Self-Insurance, were not in operation in 2008.

Monthly Parking Fee

Eight in ten respondents said they paid no parking fee at work. Most of these respondents (62%) said parking was free for all employees (Figure 13). An additional 18% of drivers said there was a charge for parking, but that vanpools were exempt from the fee (e.g., parking was free for vanpools). The remaining respondents paid a fee to park; 6% paid between $1 and $99 per month, 6% paid between $100 and $199, and 8% paid more $200 or more per month.

Figure 13
Monthly Parking Fee Paid
(n = 340)



The share of drivers in the 2020 survey who said they had free parking was higher than in the 2008 survey. In 2020, 80% of drivers reported having free parking, 14 percentage points higher than the 66% of drivers who reported free parking in 2008. The increase was primarily in the "free parking for all" category. In 2008, only 51% of respondents said free parking was universally offered. This suggests a greater share of 2020 vans were traveling to suburban locations, where parking charges were rare, when compared with the 2008 survey.

Respondents whose vans were parked for the day in Maryland were most likely to have free parking (Table 9). Nearly nine in ten (88%) of these respondents said parking was free for all employees and an additional 2% said parking was free for vanpools. Respondents who parked in Virginia were less likely to have free parking for all (66%), but another 20% said vanpools parked for free, so the overall availability of free vanpool parking was similar for Maryland (90%) and Virginia (86%).

Table 9
Monthly Vanpool Parking Fee Paid by Destination State
(District of Columbia n = 74, Maryland n = 85, Virginia n = 142)

Parking Fee	District of Columbia Percentage	Maryland Percentage	Virginia Percentage
No charge – free for all employees	27%	88%	66%
Fee charged, but free for vanpools	31%	2%	20%
Fee charged to all, including vanpools	42%	10%	14%
Parking fee $1 - $99	7%	5%	5%
Parking fee $100 - $199	9%	3%	6%
Parking fee $200 or more	26%	2%	3%

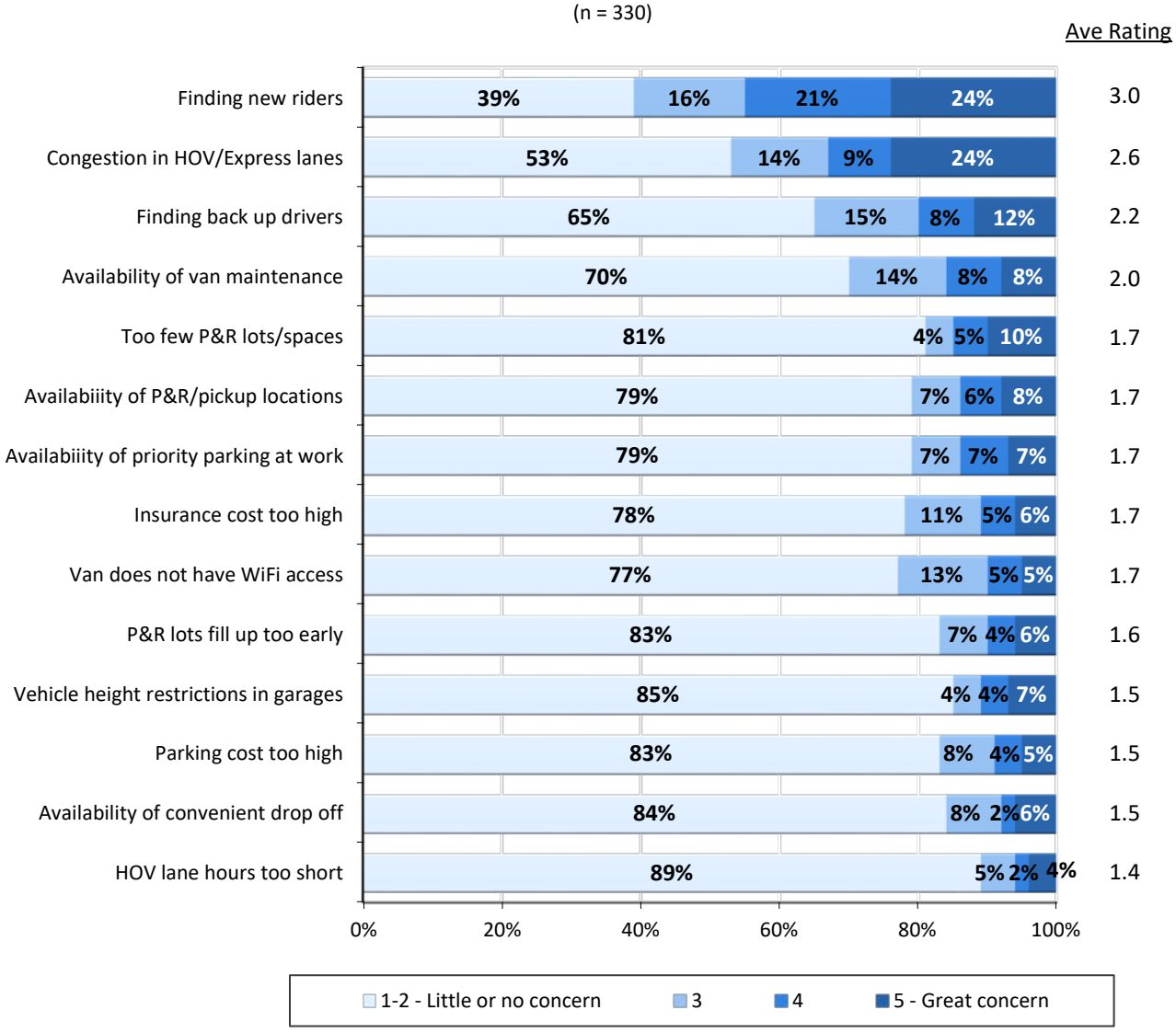
Vanpools that parked in the District of Columbia were least likely to have free parking. Only 58% reported free parking; 27% said parking was free for all employees and 31% said parking was not free to all, but was free for vanpools. Seven percent of respondents who parked in the District of Columbia paid less than $100 per month to park, but 26% said they paid $200 per month or more. Among respondents in Maryland and Virginia who did pay to park, the fees were typically under $200 per month.

Level of Concern with Vanpool Issues and Use of New Types of Vans

A final section of the survey addressed vanpool issues that might be of concern to drivers and drivers' interest in using hybrid vehicle and autonomous vehicles.

Figure 14 presents the list of possible vanpool issues that was presented in the questionnaire and shows the percentages of respondents who rated each issue as 1 (no concern) or 2, 3, 4, or 5 (great concern). The bar on the right side of the figure shows the average rating for each issue. Overall, the ratings suggest only modest concern for most issues. The highest average rating was 3.0 and only three issues had an average rating over 2.0.

Figure 14
Level of Concern with Vanpool Issues
(n = 330)



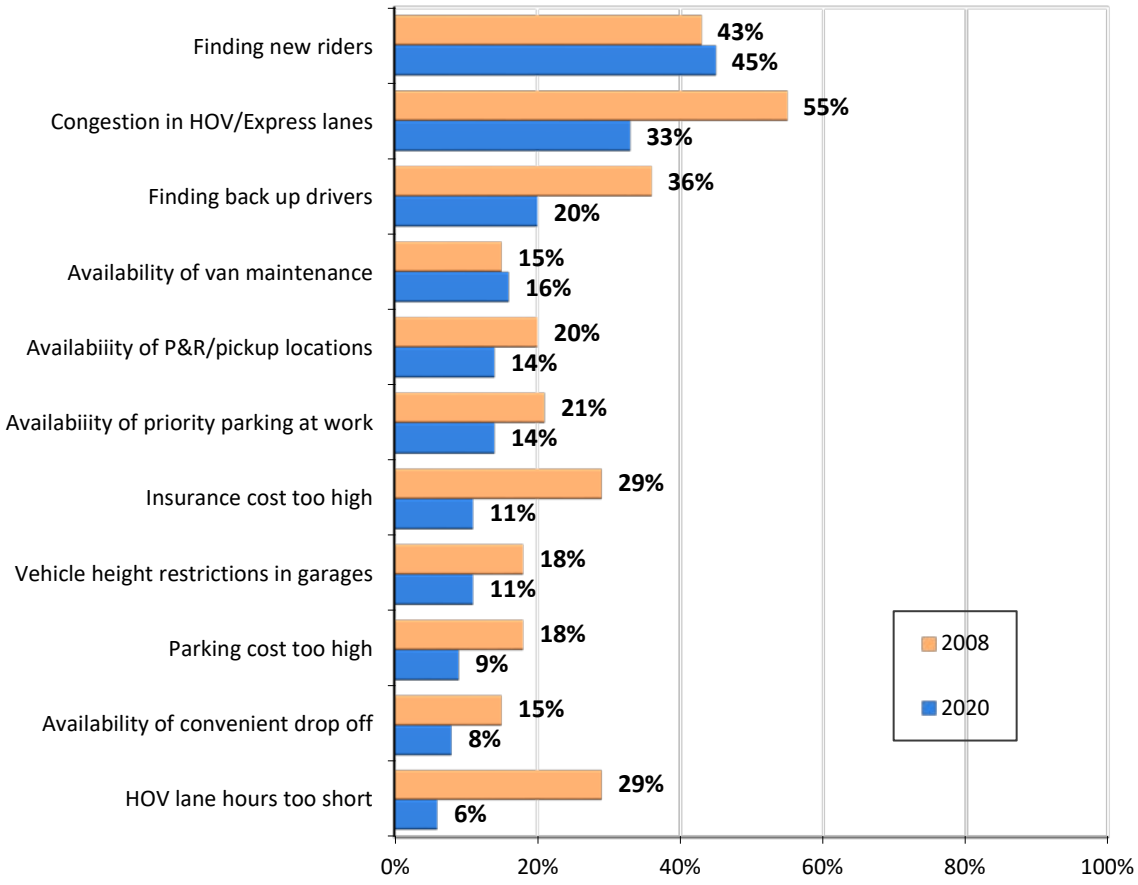
The most pressing issue was finding new riders. This issue had an average rating of 3.0 and nearly half (45%) of respondents rated this as a 4 or 5 (great concern) and 24% said it was a great concern. Congestion in HOV/Express lanes received the second highest rating, with an average rating of 2.6. This was cited as a 4 or 5 (great concern) by 33% of respondents. Drivers said finding back-up drivers (average 2.2) and availability of van maintenance locations (average 2.0) were moderate concerns.

All other issues were rated as generally lower concern. Five issues had an average rating of 1.7, with between 10% and 16% of respondents saying it was a concern (rating of 4 or 5). These included too few Park & Ride lots or spaces for riders to park, availability of Park & Ride lots or pickup locations, availability of priority vanpool parking at work, insurance cost too high, and van does not have Wi-Fi access on board. The remaining five issues were rated lower still, with average ratings of between 1.4 and 1.6. These issues included Park & Ride lots fill up too early for riders to park, vehicle height restrictions in parking garages, parking cost too high, availability of convenient drop-off locations, and HOV lane hours too short.

2020 Concerns versus 2008 Concerns

Most of the issues listed in the 2020 survey had also been asked of respondents in the 2008 survey. Figure 15 compares the percentage of 2020 respondents who rated each issue as a 4 or 5 (great concern) with the percentage who rated the issue as high in the 2008 survey. Note that three issues in the 2020 survey (too few P&R lots/spaces, van does not have Wi-Fi access on board, and P&R lots fill up too early) were not asked in 2008, so are not included in Figure 15.

Figure 15
Level of Concern with Vanpool Issues – 2020 Versus 2008
Percentage of Respondents Rating the Issue as a 4 or 5 (Great Concern)
(2008 n = 330, 2020 n = 298)



The overall ranking of issues, from greatest to lowest concern, was similar in 2020 and 2008. However, respondents appeared to find most issues less of a concern in 2020 than in 2008. Most notably, two issues related to HOV/Express lanes were substantially less of a problem in 2020. In 2020, one-third (33%) of respondents rated congestion in HOV/Express lanes as a concern; this was much lower than the 55% who rated it as a concern in 2008. Similarly, HOV lane hours too short was noted as a concern by only 6% of 2020 respondents, compared with nearly three in ten (29%) in 2008.

Two other issues also fell notably as concerns. Only 20% of 2020 respondents said finding back-up drivers was a concern, compared with 36% in 2008. And just 11% of 2020 respondents were concerned with the cost of insurance, compared with 29% in 2008. Availability of priority parking at work, availability of pick up locations, availability of drop-off locations, vehicle height restrictions in garages, and parking cost too high, also had lower levels of concern in 2020 than in 2008, but the differences were less striking. Two issues, finding new riders and availability of van maintenance, were rated as concerns by about the same share of respondents in 2020 as in 2008.

Level of Concern by Vanpool Origin and Destination

Origin State – Respondents reported similar levels of concern with most issues, regardless of the state in which the van originated (Table 10). The results were significantly different only for concern about congestion in the HOV/Express Lanes. Virginia vanpool respondents gave this concern an average rating of 2.8, notably higher than the 2.2 average rating for vanpools that originated in Maryland.

Table 10
Vanpool Issue Concern Ratings by Vanpool Origin
Average Rating (Rating Scale from 1 (No concern) to 5 (Great Concern)

Vanpool Issue	Origin State	
	Maryland (n = 88)	**Virginia** (n = 233)
Finding new riders	3.2	2.9
Finding backup driver	2.3	2.1
Congestion in HOV/Express Lane	2.2	2.8
HOV lane hours too short	1.6	1.4
Availability of P&R/pickup locations	1.6	1.7
Availability of convenient drop off locations	1.6	1.5
Too few P&R lot spaces	1.6	1.7
P&R lot spaces fill up too early	1.6	1.6
Availability of priority parking at work	1.8	1.7
Parking cost too high	1.5	1.5
Vehicle height restrictions in garages	1.4	1.5
Availability of van maintenance locations	2.2	1.9
Insurance cost too high	1.9	1.6
Van does not have Wi-Fi on board	1.9	1.6

Destination State – Average ratings also varied only slightly by the vanpool destination, that is, where the van parked during the day (Table 11). The only statistically significant differences in ratings were for issues related to parking at the workplace. Respondents whose vanpools were destined for District of Columbia worksites gave distinctly higher ratings than did either Maryland or Virginia respondents for concern about the cost of parking and vehicle height restrictions in garages. District of Columbia and Maryland vanpools both were more concerned about the availability of priority parking at work than were Virginia respondents.

Table 11
Vanpool Issue Concern Ratings by Vanpool Destination

Vanpool Issue	Destination State		
	District of Columbia (n = 63)	Maryland (n = 78)	Virginia (n = 129)
Finding new riders	3.2	3.2	2.8
Finding backup driver	2.3	2.2	2.0
Congestion in HOV/Express Lane	2.9	2.5	2.5
HOV lane hours too short	1.5	1.5	1.4
Availability of P&R/pickup locations	1.8	1.8	1.6
Availability of convenient drop off	1.5	1.7	1.4
Too few P&R lot spaces	1.7	1.7	1.7
P&R lot spaces fill up too early	1.8	1.5	1.5
Availability of priority parking at work	1.9	1.9	1.4
Parking cost too high	2.1	1.3	1.4
Vehicle height restrictions in garages	2.1	1.2	1.3
Availability of van maintenance locations	1.8	2.2	1.9
Insurance cost too high	1.7	1.7	1.6
Van does not have Wi-Fi on board	1.6	1.8	1.7

Level of Concern by Population Sub-Groups

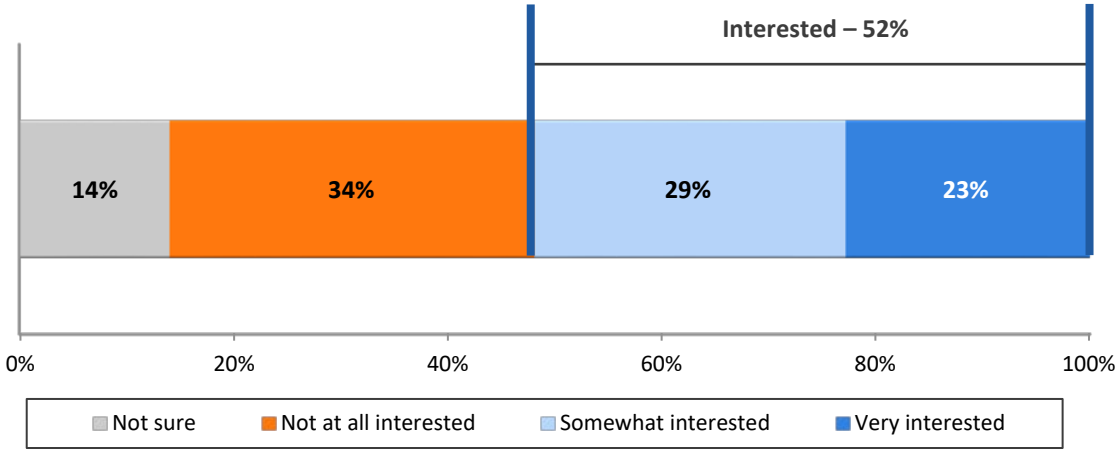
Similarly, few differences were noted in concern ratings by other vanpool variables. Two differences that were observed related to HOV/Express Lanes and parking cost. Respondents who used HOV/Express Lanes had much greater concern with congestion in the HOV/Express Lanes (3.0 average rating) than did respondents whose vans did not use these lanes (1.3 average rating).

The other concern that varied significantly by respondent sub-group was parking cost by the monthly parking fee paid, with, not surprisingly, respondents who paid more for parking rating this a greater concern. Respondents who paid $200 or more per month for parking rated this concern 3.1 on average, compared to a rating of 2.8 for respondents who paid between $100 and $199, a rating of 2.2 for respondents who paid between $1 and $99 per month, and a rating of 1.2 for respondents who said they had free parking.

Interest in Using Autonomous Van Vehicle

The 2020 survey added several new questions to explore vanpool drivers' interest in using two technologies that were not known in 2008; autonomous (self-driving) vehicles and hybrid/electric vans. At the time of the survey, these vehicles were undergoing testing in several regions of the country and news media were reporting on the tests. While vanpool vehicles had not been tested, the survey asked drivers how interested they would be in using an autonomous van. As shown in Figure 16, more than half of all respondents expressed some interest; 29% were somewhat interested and 23% were very interested.

Figure 16
Interest in Using Autonomous (Self-driving) Van
(n = 343)



Reasons Drivers Were Not Interested – Drivers who were not interested were asked a follow-up question about why they were not interested. The overwhelming impression of these respondents was that they were not confident of the safety and reliability of autonomous vehicles. Specific responses included:

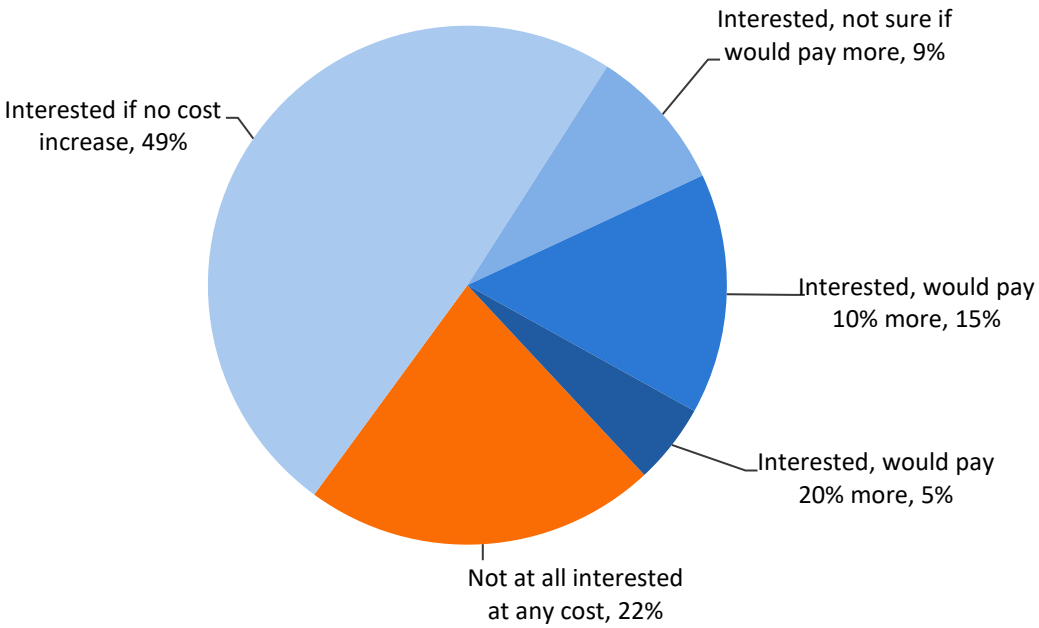
- Would not feel safe in an autonomous vehicle – 27%
- Do not trust the technology – 27%
- Technology is too new/not well tested – 20%
- Want to be in control of the vehicle/like to drive – 17%
- Do not trust other drivers – 7%

Interest in Using Hybrid or Electric Van Vehicle

The 2020 survey also asked respondents how interested they would be in using an electric (plug-in) or hybrid van. The question was asked in two parts. First, respondents were asked about their interest if the van purchase or lease cost was the same as they were paying. Slightly over six in ten respondents expressed some interest; 38% said they were very interested and 25% were somewhat interested.

Respondents who said they were somewhat or very interested at their current cost were asked how much more they would be willing to pay to use this type of vehicle. Figure 17 shows the combined results of these two questions, with the responses represented as the percentages of total respondents. Across all vanpools, 22% were not interested in electric/hybrid vans, no matter the cost, and 49% would be interested only if the cost was no higher than the current cost. Two in ten respondents were interested and willing to pay more; 15% would pay up to 10% more and 5% would pay up to 20% more. The remaining 9% said they were interested, but were not sure if they were willing to pay more.

Figure 17
Interest in Electric/Hybrid Vans
(n = 344)



Reasons Drivers Were Not Interested – Drivers who said they were not interested at any cost were asked why they were not interested. The primary reason was the lack of charging stations at home, at work, or at Park & Ride lots where they parked during the day or overnight; 44% of disinterested drivers cited this reason. About one in ten (12%) said it would add new responsibilities for the driver. Nine percent cited a safety concern related to the batteries and 9% were concerned about the battery life, fearing they would not have enough charge time to complete the trip if an accident or other roadway incident caused a delay in the trip. Three percent said their vanpool trip was so long that it would exceed the typical electric vehicle range and 3% said it would cost more or not save any money.

APPENDICES

APPENDIX A
2020 Vanpool Survey Questionnaire

Intro for landing page

The Commuter Connections program at MWCOG is conducting this survey of vanpool drivers. Vanpools are an important means of commute transportation and the results of this survey will be used to identify current vanpooling practices and to plan for improved facilities and services for vanpools. Your answers will be confidential. Please complete the survey and click on the "SUBMIT" button at the end.

Commuter Connections is offering a drawing for three $100 Amazon gift cards for vanpool drivers/coordinators that complete the survey. If you would like to participate in the drawing for one of the gift cards, please provide your name and email address at the end of the survey.

Van Ownership and Operation

1. How long has this vanpool been in operation? If less than one month, enter a "1."

Number of months	
888 Not sure	

999 Left blank

1a. Are you the primary driver or a back-up driver of this vanpool? Please select only one option.

1 Primary driver
2 Back-up driver
3 Not a driver – vanpool coordinator **(SKIP TO Q3)**
4 Not a driver – perform another vanpool role (specify) _____ **(SKIP TO Q3)**
999 Left blank

2. How long have YOU been a driver of this vanpool? If less than one month, enter a "1."

Number of months	
888 Not sure	

999 Left blank

3. Who owns the van? Please select only one option.

1 Myself or a family member
2 Leasing agency (Please specify agency name) _____
3 Employer
4 Private party outside my family
5 Other (please specify) _____

4. What is the make/model and year of your van?

1 Van make/model		999 Left blank
2 Van model year		999 Left blank

IF Q3 = 2, SKIP TO Q5c

5. Which of the following best describes the type of insurance covering your van? Select all that apply.

1 Personal
2 Commercial
3 AdVANtage Vanpool Self-Insurance Program (Virginia)
4 Other (please specify) _____
999 Left blank

5a Who pays for the insurance?

1 Myself
2 Van owner
3 Other (please specify) _____
999 Left blank

Vanpool Use

5c What is the passenger capacity of the van (including the driver), if every seat is filled?

Passenger capacity	
88 Not sure	❍

99 Left blank

6 How many people, including the driver, usually ride in the vanpool?

Usual number of riders	
88 Not sure	❍

99 Left blank

7 How many people, including the driver, rode in the vanpool last Wednesday?

Number of riders last Wednesday	
88 Not sure	❍

99 Left blank

7a In a typical week (e.g., no holidays, no snow days), does the vanpool operate every weekday (Monday – Friday)?

1 Yes **(SKIP TO Q8)**
2 No **(ASK Q7b AND Q7c)**
999 Left blank **(SKIP TO Q8)**

7b Which weekdays does the vanpool NOT operate? Select all that apply.

1 Monday
2 Tuesday
3 Wednesday
4 Thursday
5 Friday
999 Left blank

7c Why does the vanpool NOT operate on that/those weekdays? Select all that apply.

1 All riders telework from home that day
2 All riders have a compressed work schedule day off
3 Riders work a shift that includes some weekend days in place of weekdays
4 Other _____
999 Left blank

8 In what home area does your vanpool originate (i.e., where is your van parked overnight)? Please specify town, city, or community. Also, please provide the zip code of this location.

Town, City, Community_____
Zip code _____

9 How many stops does your van make in the morning to pick up passengers?

1 One stop (all riders meet at a single central meeting place)
2 2 stops
3 3 stops
4 4 or more stops
99 Left blank

IF Q9 = 2, 3, 4, OR 99, INSERT "of both the first and last pick-up locations" IN Q10.

10 Where does the van pick up riders in the morning? Please note the street address, nearest cross streets, or Park & Ride location [*of both the first and last pick-up locations*]. Also indicate the town or city.

IF Q9 = 1, SHOW ONLY THE "FIRST PICK-UP LOCATION" ROW
IF Q9 = 2, 3, 4, OR 99, SHOW BOTH THE "FIRST PICK-UP LOCATION" AND "LAST PICK-UP LOCATION" ROWS

PICK UP	Street address/cross-streets or Park & Ride lot	Town/City
First pick-up location		
Last pick-up location		

11 Where is the van parked during the day? Please note the street address or nearest cross streets. Also indicate the town or city.

PARK AT WORK	Street address or cross-streets	Town/City
Parking location		

11a Does the van drop off passengers in the morning at another location BEFORE this parking location or is the parking location the only drop off?

1 Parking location is the only morning drop off for passengers
2 Some passengers are dropped off at another location before the van reaches the parking location
99 Left blank

IF Q11a = 1, SKIP TO Q12
IF Q11a = 2 OR 99 (more than 1 drop-off location), ASK Q11b

11b Where does the van first drop off riders in the morning? Please note the street address or nearest cross streets. Also indicate the town or city.

DROP OFF	Street address or cross-streets	Town/City
First drop off location		

12 At what times do the following morning vanpool activities occur? (usual/scheduled clock time)

IF Q11a = 1, SHOW ONLY ROWS 1, 2, AND 4

IF Q11a = 2 OR 99 (more than 1-drop-off location), SHOW ALL ROWS 1-4

IF Q9 = 2, 3, 4, OR 99 (more than 1 pick-up location), INSERT "last" in activity 2

MORNING VANPOOL ACTIVITY	Usual / Scheduled Clock Time
1 Driver leaves his/her residence at:	
2 Van leaves *[last]* pick-up location at:	
3 Van arrives at first drop-off location at:	
4 Van is parked for work at:	

13. Approximately how many miles is each of the following segments of your vanpool trip?

SHOW RESPONSE ROWS IN Q13 BASED ON THE FOLLOWING RESPONSES TO Q9 AND Q11a:
IF Q9 = 1 (only 1 pick-up) AND Q11a = 1 (only 1 drop-off), SHOW ONLY ROWS 1 AND 2
IF Q9 = 2, 3, 4, OR 99 (more than 1 pick-up) AND Q11a = 1 (only 1 drop-off), SHOW ONLY ROWS 1 AND 3
IF Q9 = 1 (only 1 pick-up) AND Q11a = 2 OR 99 (more than 1 drop-off), SHOW ONLY ROWS 1 AND 4
IF Q9 = 2, 3, 4, OR 99 (more than 1 pick-up) AND Q11a = 2 OR 99 (more than 1 drop-off), SHOW ONLY ROWS 1 AND 5

VANPOOL TRAVEL DISTANCE	Distance (miles)
1 Miles from driver's residence to worksite/parking location	
2 Miles from pick-up location to worksite/parking location	
3 Miles from last pick-up location to worksite/parking location	
4 Miles from pick-up location to first drop-off stop	
5 Miles from last pick-up location to first drop-off stop	

14 What major roadways does the van take for the trip to work? Please select all that apply.

Interstates

1 Capital Beltway (I-495) (MD)
2 Capital Beltway (I-495) (VA)
3 I-66 OUTSIDE the Beltway (VA)
4 I-66 INSIDE the Beltway (VA)
5 I-95 (MD)
6 I-95 (VA)
7 I-270 (MD)
8 I-295 (DC / MD)
9 I-395 (VA)
10 I-695 (DC - Southeast-Southwest Freeway, Southwest Expressway)
11 I-695 (MD - Baltimore Beltway)

Major State / US Routes

12 BW Parkway (US 295, Baltimore-Washington Parkway - MD)
13 Dulles Toll Road (Dulles Greenway, Route 267)
14 GW Parkway (George Washington Parkway)
15 ICC (Inter-County Connector, Route 200)
16 US Route 1 (MD)
17 US Route 1 (VA - Richmond Highway, Jefferson Davis Highway)
18 US Route 29 (MD - Colesville Road, Columbia Pike)
19 US Route 29 (VA – Lee Highway)
20 US Route 50 (MD – John Hanson Highway)
21 US Route 50 (VA – Lee Jackson Highway, Arlington Blvd, Fairfax Blvd)
22 US Route 301 (MD)
23 Other _____

98 Van does not use any of these Interstate or U.S. or state routes **(SKIP TO Q16)**
999 Left blank

15 Does the vanpool use an HOV lane or HOT/Express Lane for any portion of the trip to work?

1 Yes
2 No
999 Left blank

IF Q15 = 1 OR 99, ASK Q15a
IF Q15 = 2, SKIP TO Q16

15a Which HOV lane or HOT/Express Lane roads does the vanpool use? Please select all that apply.

1 NA – Do not show on screen
2 Capital Beltway (I-495) (VA)
3 I-66 OUTSIDE the Beltway (VA)
4 I-66 INSIDE the Beltway (VA)
5 I-95 (MD)
6 I-95 (VA)
7 I-270 (MD)
8 NA – Do not show on screen
9 I-395 (VA)
10 NA – Do not show on screen
11 NA – Do not show on screen
12 NA – Do not show on screen
13 Dulles Toll Road (Route 267)
14 NA – Do not show on screen
15 ICC (Inter-County Connector, Route 200)
16 NA – Do not show on screen
17 NA – Do not show on screen
18 NA – Do not show on screen
19 NA – Do not show on screen
20 US Route 50 (MD – John Hanson Highway)
21 NA – Do not show on screen
22 NA – Do not show on screen
23 Other HOV or Express Lane _____
999 Left blank

Vanpool Assistance and Services

16. In forming your vanpool, did you receive assistance from your employer or from an organization that helps with vanpool formation, organization, or ridership?

1 No
2 Yes, from employer
3 Yes, from another organization (specify) _____
999 Left blank

17 Do you or does your vanpool receive any of the following services/benefits, from your employer, from a commute service organization, or from a local jurisdiction agency? Please select all that apply.

1 No vanpool services or benefits
2 Reserved van parking at work
3 Van parking close to the building at work
4 Discounted or free van parking at work
5 Payment or subsidy from employer for any vanpool cost
6 Vanpool start-up or other subsidy from any other organization
7 Flexible work hours (arrival and departure times)
8 Guaranteed Ride Home program
9 AdVANtage Vanpool Self-Insurance Program (Virginia)
10 Vanpool Alliance (Virginia)
11 'Pool Rewards
12 Other (specify) _____
999 Left blank

18 What is the monthly parking fee for your van where it is parked during the day? Please select only one option.

1 No charge, parking is free for ALL employees
2 No charge, parking is free for vanpools
3 $1 - $49 per month
4 $50 - $99 per month
5 $100 - $149 per month
6 150 - $199 per month
7 $200 - $249 per month
8 $250 or more per month
999 Left blank

Other Issues

19 Following is a list of issues that might be of concern to vanpool drivers. Using a scale of 1 to 5, with "1" being "no concern" and "5" being "great concern," please rate your level of concern about each issue.

Possible Vanpool Issues	1 No con-cern	2	3	4	5 Great concern	8 Not sure
1 Insurance cost too high	❍	❍	❍	❍	❍	❍
2 Cost of parking too high	❍	❍	❍	❍	❍	❍
3 HOV lane hours too short	❍	❍	❍	❍	❍	❍
4 Congestion in HOV/HOT/Express Lanes	❍	❍	❍	❍	❍	❍
5 Finding new riders	❍	❍	❍	❍	❍	❍
6 NA – do not show on screen	❍	❍	❍	❍	❍	❍
7 Finding back-up drivers	❍	❍	❍	❍	❍	❍
8 Vehicle height restrictions in parking garages	❍	❍	❍	❍	❍	❍
9 Availability of P&R lots/pick-up locations	❍	❍	❍	❍	❍	❍
10 NA – do not show on screen	❍	❍	❍	❍	❍	❍
11 Availability of priority parking at work	❍	❍	❍	❍	❍	❍
12 Availability of convenient drop-off locations	❍	❍	❍	❍	❍	❍
13 Availability of van maintenance locations	❍	❍	❍	❍	❍	❍
14 Too few Park & Ride lots/spaces for riders to park	❍	❍	❍	❍	❍	❍
15 Park & Ride lots fill up too early for riders to park	❍	❍	❍	❍	❍	❍
16 Van does not have wi-fi access on board	❍	❍	❍	❍	❍	❍

19a How interested would you be in using an autonomous (self-driving) van?

1 Not at all interested
2 Somewhat interested
3 Very interested
888 Not sure
999 Left blank

IF Q19a = 2, 3, 888, OR 999, SKIP TO Q19c
IF Q19a = 1, ASK Q19b

19b Why are you not interested in using an autonomous van?

_____
_____

19c How interested would you be in using an electric (plug-in) or hybrid van, if the van purchase or lease cost was the same as you pay now?

1 Not at all interested
2 Somewhat interested
3 Very interested
4 Vanpool already uses an electric or hybrid van
888 Not sure
999 Left blank

IF Q19c = 1 OR 4, SKIP TO Q19e
IF Q19c = 2, 3, 888, OR 999, ASK Q19d

19d If the cost for an electric or hybrid van was more than you pay now, what additional cost would you be willing to pay to use this type of van? **(ALLOW ONE RESPONSE ONLY)**

1 0% - would not be interested if the cost was more than I pay now
2 Would pay up to 10% more
3 Would pay up to 20% more
4 Would pay up to 30% more
888 Not sure
999 Left blank

SKIP TO Q20

19e Why are you not interested in using an electric or hybrid van?

_____
_____

20. If you have other comments about vanpooling or vanpool services, please note them below.

_____
_____

21 Commuter Connections is offering a drawing for three $100 Amazon gift cards for vanpool drivers/coordinators that complete the survey. If you would like to participate in the drawing, please provide your name and email address so we can send you the $100 gift card if you are one of the three winners. Please be assured that we will not sell or use your information for anything other than sending you the gift card.

1 Yes, I would like to participate in the drawing **(ASK Q21)**
2 No, I do not want to participate in the drawing **(SKIP TO END)**
89 Left blank **(SKIP TO END)**

21a Please provide your name and email address so we can contact you if you are one of the three winners.
First Name:
Last Name:
Email Address:

Thank you very much for your time and cooperation! Your answers will be confidential.

APPENDIX B
COG/Commuter Connections Sample Survey Invitation Email

COG sends email invitations to vanpool drivers after merging record with a unique PIN

<date>

Dear Vanpool Driver,

The Commuter Connections program at the Metropolitan Washington Council of Governments (COG) is conducting a brief survey of vanpool drivers in the region. Vanpools are an important means of transportation for commuting in the Washington region. Our last vanpool survey was conducted in 2008 and it is important that we update the regional vanpool characteristics and opinions.

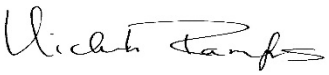
The results of this survey will be used to identify current vanpooling practices and to plan for improved facilities and services for vanpools in the future. Our goal is to have either a driver or coordinator from each vanpool in the region participate in the survey. Commuter Connections is offering a drawing for three $100 Amazon gift cards to participants who complete the survey.

The survey will take about 10 minutes. Survey participants will not be identified by name, but instead by a unique number ID. Additionally, all survey results will be kept confidential.

Please click on the following web address to start the survey:
https://us1se.voxco.com/SE/1394/CVPD20/?P=XXXXX

Thank you in advance for your participation. If you have any questions, please feel free to contact me at nramfos@mwcog.org or at (202) 962-3313.

Sincerely,



Nicholas Ramfos
Director
Commuter Connections

APPENDIX C
Enterprise Vans Sample Survey Invitation Email

Enterprise sends email invitations to vanpool drivers

<date>

Dear Vanpool Driver,

The Commuter Connections program at the Metropolitan Washington Council of Governments (COG) is conducting a survey about vanpooling in the Washington metropolitan region. Vanpools are an important means of transportation for commuting and the last such survey was conducted in 2008. Enterprise is requesting your participation in the survey. The results will be used to identify current vanpooling practices and to plan for improved vanpool facilities and services.

You might recently have received an email (from ridematching@MWCOG) with a link to this survey from Nicholas Ramfos, Director of Commuter Connections at COG, if your vanpool participates in vanpool assistance services offered by COG or other organizations in the region.

If you already completed the survey from that email, thank you. Please do NOT take the survey again. Our goal is to have just one completed survey from each vanpool in the region.

If you did NOT take the survey already or did not receive that email, please click on the following web address to start the survey:
https://us1se.voxco.com/SE/1394/EVPD20/

The survey will take about 10 minutes. Survey participants will not be identified by name and all survey results will be confidential. Additionally, Commuter Connections is offering a drawing for three $100 Amazon gift cards to participants who complete the survey.

Thank you in advance for your participation. If you have any questions, please feel free to contact me at [*Enterprise contact name and email or telephone number*]. You also may contact Nicholas Ramfos at nramfos@mwcog.org or at (202) 962-3313.

Sincerely,

[*Add signature block here*]

[*Contact Name*]
[*Contact* Title]
Enterprise