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Capital Beltway Update: Beltway User Focus Groups

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16. Abstract The Capital Beltway is 64 miles of roadway surrounding Washington, D.C. The Capital Beltway Safety Team, led by officials from Maryland and Virginia, was formed to address safety issues on this urban interstate highway. This report documents the results of focus groups run during May, 1997 for the Safety Team. Of the eight groups conducted: three were composed of representative Beltway drivers of private passenger vehicles; two were composed of specifically selected "aggressive drivers;" and three were composed of commercial truck drivers. Procedures followed those used in 1994 for a similar study. The results indicated that roadway design and maintenance issues were of less concern to focus group participants in 1997 as compared with 1994 likely reflecting Beltway improvements made during the last three years. Unsafe driving actions, including aggressive driving, were of more concern. Focus group participants supported information, education, licensing and congestion reduction countermeasures. They also supported vigorous law enforcement of traffic laws even knowing that law enforcement presence would add to traffic congestion.					
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Table of Contents

	<u>Page</u>
Executive Summary	1
Background	1
Method	1
Findings	3
Possible Solutions	4
Aggressive Drivers	4
Aggressive Drivers Are Often Competitive	5
More Enforcement Wanted by Drivers	6
Incident and Traffic Management Issues Supported	7
Work Zone Issues Supported	8
Operation and Design Issues	8
Trucks and Cars Complain About Each Other	9
Public Information and Education Issues	10
Detailed Findings	12
General Discussion	12
Pattern of Beltway Use	12
Reasons for Using Beltway	13
Dislikes	13
Perceived Safety on the Beltway	16
Perceived Crash Causes	19
Solutions	24
Specific Issues	30
Aggressive Driving	30
Enforcement Issues	33
Incident and Traffic Management Issues	41
Work Zone Safety Issues	43
Operation and Design Issues	45
Truck Related Issues	48
Public Information and Education Issues	52
APPENDIX A: Beltway Users Discussion Guide	
APPENDIX B: Beltway Truck Driver Discussion Guide	

List of Tables

<u>Table Number</u>		<u>Page</u>
1	Composition of Beltway Driver Groups	2
2	How Participants Use the Beltway	12
3	Perceived Causes of Beltway Crashes	21
4	Perceived Causes of Beltway Crashes - Commercial Drivers	23
5	Responses to Aggressiveness Screening Questions	32

List of Figures

<u>Figure Number</u>		<u>Page</u>
1	Questionnaire Responses - General vs. Aggressive Drivers	5

Executive Summary

Background

This report covers the third in a series of focus groups conducted by Preusser Research Group (PRG) to assess Beltway drivers' perceptions of safety on the Capital Beltway. The first was conducted in August, 1994, to provide the Capital Beltway Safety Team with information to guide their priorities about recommendations contained in the Washington Area Highway Safety Initiative of November, 1993. The second wave, conducted in June, 1995, was more limited in scope. Its purpose was to obtain Beltway driver feedback to two public service announcements about unsafe driving behavior (specifically behaviors associated with "aggressive driving") and safety reminders being considered for variable message boards around the Beltway.

The primary purpose of the present project was to reassess Beltway drivers' perceptions of problems they experience on the Beltway and to document their reactions to recent improvements. These include engineering changes, law enforcement efforts, and public information and education programs. A second objective was to assess motorists awareness of the "Smooth Operator" program. "Smooth Operator" was a coordinated law enforcement effort conducted around the Washington, D.C. area to reduce unsafe driving incidences. A third objective was to explore the topic of aggressive driving, which had been receiving media coverage in recent months. The information will be used to assist the Capital Beltway Safety Team in formulating new plans.

Method

With a view toward determining how Beltway drivers' perceptions have changed since 1994, the basic structure of the 1994 focus groups was replicated in the current wave, with a few changes to enhance the sensitivity of the research to the topic of aggressive driving.

PRG conducted a series of eight focus group discussions with Beltway drivers. By design, three groups represented the general population of Beltway drivers, two groups represented "aggressive" drivers, and three groups represented drivers of commercial vehicles. Focus group research is an exploratory technique designed to provide an understanding of an issue and to raise potential questions for further research. Focus groups typically provide qualitative rather than quantitative results.

The three general population groups included a broadly representative sampling of Maryland and Virginia residents who drive on the Beltway. All participants were required to be licensed drivers who drive on the Capital Beltway at least one day a week. Quotas were established to ensure that each group would consist of drivers from both Maryland and Virginia, both genders, and all ages between 21 and 59 representative of drivers on the Beltway. Since Maryland's portion of the Beltway is approximately twice that of Virginia's, there were more

Maryland participants. Qualifications and quotas for these groups were identical to those used in 1994.

The two aggressive driver groups were recruited among drivers who met the general qualifications and who scored high on eight screener questions designed to measure anger, impatience, competitiveness, and vindictiveness of the driver in frequently encountered driving situations. The questions were derived from a driver stress profile developed by Dr. John Larson, and contained in his recent book on aggressive driving, *Steering Clear of Highway Madness*. Since Dr. Larson's profile contained too many questions to be practicable for telephone screening of prospective participants, PRG selected two questions from each category. The general driver population participants were recruited first. The most aggressive third of the general population drivers had scores of six or more on the screening questions. Accordingly, six was established as the threshold for qualifying participants in the aggressive driver groups. Although the procedure was somewhat arbitrary, results of the group discussions confirm that the aggressive groups indeed are more likely to engage in risky driving practices.

The five sessions involving Beltway drivers were held in a permanent focus group interviewing facility in Chevy Chase, Maryland. Members of the Capital Beltway Safety team observed the sessions through a one-way mirror. The focus groups were recorded on both audio and video tape.

Table 1. Composition of Beltway Driver Groups.

Characteristics		General Drivers			Aggressive Drivers		Total (N=52)
		May 6 6:00 p.m. (N=11)	May 6 8:00 p.m. (N=11)	May 7 6:00 p.m. (N=10)	May 7 8:00 p.m. (N=10)	May 8 6:00 p.m. (N=10)	
Residence	Maryland	7	7	6	7	7	34
	Virginia	4	4	4	3	3	18
Gender	Male	5	6	5	5	5	26
	Female	6	5	5	5	5	26
Age	21-39	9	7	5	7	4	32
	40-59	2	4	5	3	6	20
Beltway Use	1-2 Days	4	2	3	3	2	14
	3+ Days	7	7	7	7	8	36
	Variable	0	2	0	0	0	2
Aggressiveness Score	0 to 2	3	2	4	0	0	9
	3 to 5	3	5	4	0	0	12
	6 to 9	5	4	1	8	8	26
	10 +	0	0	1	2	2	5

Two of the three groups of commercial drivers were from the same companies that participated in 1994. They were Roadway Express (held at the Alexandria terminal) and North American Van Lines (held at the Hyattsville terminal). In fact, several of the drivers in each of these two groups were the same drivers who participated in 1994. The third group, representing drivers of straight trucks, were employees of Skippy's Trucking of Manassas, Virginia. These were dump truck drivers, either hauling bulk materials to asphalt plants or asphalt paving material to road construction sites. They replaced drivers from Sea-Cap, a fresh seafood delivery company that participated in the 1994 groups. The 1997 commercial driver sessions had a total of 17 participants, six at Skippy's, five at Roadway Express and six at North American Van Lines. The commercial driver discussions were held in or near trucking company terminals, by arrangement with terminal managers. Audio recordings were made of the truck driver sessions.

Findings

The reason Capital area motorists use the Beltway was the same in 1997 as it was in 1994. They believe the Beltway still is the quickest, easiest way to get people where they want to be. In many cases, people do not believe there are other choices, especially if the trip involves crossing the Potomac from Virginia to Maryland or vice versa.

Although some motorists are apprehensive about the safety of driving on the Beltway, most are not. Even those who see the Beltway as more hazardous than other interstate highways consider the risks acceptable. Few of the participants have experienced crashes on the Beltway, although many have experienced near misses.

As in 1994, congestion still is the major issue motorists and truckers dislike about the Beltway because congestion interferes with drivers' desires to complete their trips quickly. Although safety issues emerge when people are asked what they dislike about the Beltway, they do not seem to be as universal as complaints about congestion.

When motorists were asked to evaluate the safety of driving on the Beltway, a sizable minority described it as hazardous. Most, however, did not think it more hazardous than travel on other urban interstates. Many believe, however, that it is more hazardous now than it was three years ago, reflecting increasing concerns about aggressive driving behavior.

Focus group participants listed and ranked perceived causes of Beltway crashes. There were some remarkable differences between the 1994 and 1997 groups. Unsafe driving behaviors were among the most important factors in both years, but the 1997 participants ranked them among their top three causes twice as often as the 1994 participants. Excessive speed, aggressive driving, inattention, unsafe lane changing, and tailgating were most frequently designated major crash causes in the 1997 focus groups. Aggressive driving was the number one concern among the "general" motorist groups. It was mentioned as one of the three most serious crash causes by 53 percent of the participants. This compares with only 2 percent among the 1994

participants. Interestingly, the aggressive driver groups were less concerned about aggressive driving, 15 percent of them mentioned aggressive driving as one of the major crash causes.

The perception that congestion is a major crash cause was only half as frequent in 1997 as it was three years earlier. A possible explanation is that current concern about unsafe drivers has drawn attention away from congestion. Beltway traffic has not diminished in the past three years, and there have been many roadway and traffic management improvements that may have relieved some congestion.

Roadway design and maintenance factors also have declined as perceived major causes of Beltway crashes. Mentions of design and maintenance factors as major crash causes decreased from 97 percent in 1994 to 33 percent in 1997. Merge lanes where motorists share acceleration and deceleration lanes were the top concern in the category, and the percentage did not change much between 1994 and 1997.

Commercial drivers' lists of crash causes were similar to those of other Beltway users.

Possible Solutions

Each of the 1997 focus groups was asked to take a few minutes and discuss possible solutions for the one or two crash causes most members of the group had ranked among the three most serious causes. Three groups discussed solutions to speeding, two addressed aggressive driving, two discussed unsafe lane changing, and two discussed how to deal with bad weather. Inattentiveness, truck blind spots, and driver training also were topics of brief problem solving sessions.

Aggressive Drivers

A general consensus among participants of what driver's meant by the term "aggressive driving" was not exactly clear, but included actions such as weaving in and out of traffic to get ahead, tailgating, excessive speed and conflicts with other motorists.

Suggestions to help solve the aggressive driver problem include the following items:

- Photo imaging aggressive drivers (two groups "invented" this without knowing about Maryland's plans)
- More enforcement campaigns like "Smooth Operator"
- More law enforcement presence on the road
- More law enforcement vehicles cruising, fewer stopped on the shoulder
- More emphasis on unsafe driving, less on speed and minor violations
- Tougher sanctions on repeat violators

The following suggestions were made to counter unsafe lane changing:

- More law enforcement presence (including enforcement solutions recommended above)
- "Keep Right" education and enforcement
- PI&E on dangers of unsafe lane changes
- Courtesy campaigns

More highly structured questions were asked of the groups on a number of topics of specific interest to the Capital Beltway Safety Team. Since the volume of issues to be covered exceeded the time available in each group, some topics were not discussed in all groups. The key findings on each topic are shown below:

Aggressive Drivers Are Often Competitive

A battery of questions asked how often motorists got angry, were impatient, were competitive or punished other drivers in driving situations. While almost all drivers said they at least sometimes got angry when another car cut them off, or felt impatient if they were behind schedule, there were some clear differences in whether they engaged in competitive or vindictive actions.

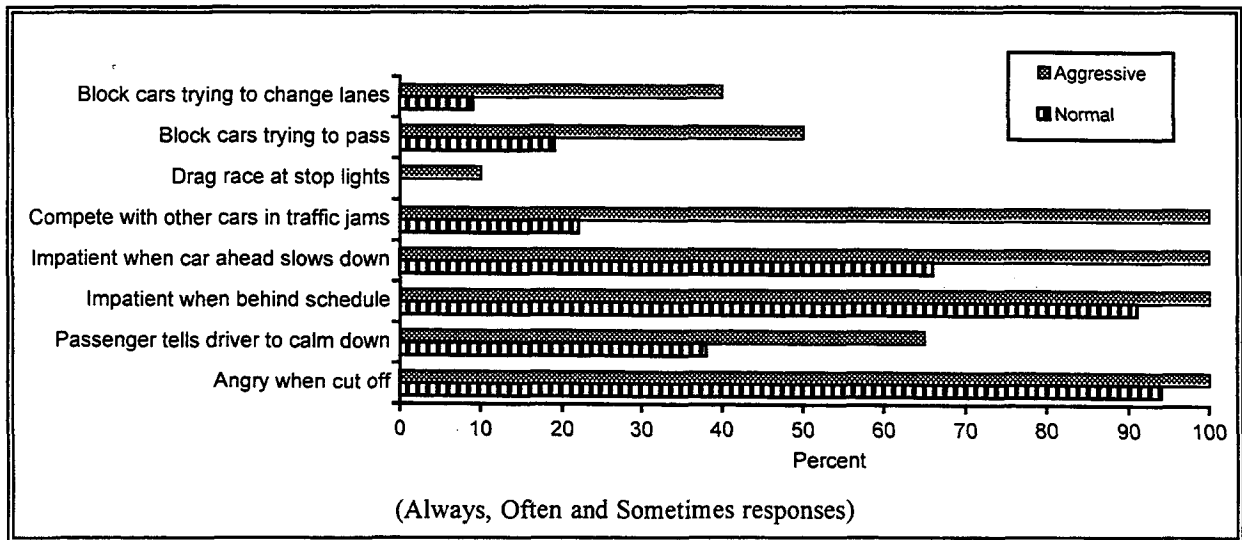


Figure 1. Questionnaire Responses - General vs. Aggressive Drivers.

The most discriminating question was how often participants compete with other cars in traffic jams. Seventy-five percent of the participants in the aggressive driver groups said they "always" or "often" compete while none of the participants in the "general" groups compete that frequently. Drivers in the aggressive group also said they more frequently got angry when

cut off, had passengers tell them to calm down, blocked other cars trying to pass, and blocked cars trying to change lanes. One woman called driving on the Beltway "A competitive sport." Aggressive drivers spoke differently from the general drivers. Both groups blame much of the unsafe driving on the Beltway on the "other driver." General groups expressed dismay at specific unsafe driving maneuvers that make them nervous on the Beltway -- the drivers who speed, change lanes frequently, cut them off, and force their way ahead. Aggressive drivers, on the other hand, blame those who are going too slow in the passing lane, cars at the speed limit who "force" them to change lanes and weave in and out of traffic. As one young woman phrased it, "Get out of my way, please."

Aggressive drivers also admitted to going much faster than the general groups -- at speeds of 60-70 during non-peak hours. They think that is a safe speed and that cars going 55 mph should be in the slow lanes. They speak of "Left Lane Etiquette." One young man said "If I'm going 80 mph in the fast lane and someone comes up behind me, I should move out of his way." They think slower drivers are the problem.

Interestingly, the aggressive drivers think there should be a minimum speed limit on the Beltway and it should be 55 mph. The general groups thought a minimum speed limit should be set at about 40 mph.

While the aggressive drivers are moving at speed to get to their destination, they express annoyance at other drivers who hinder their progress. Paradoxically, the aggressive drivers will go out of their way to block another car trying to pass or cut in front of them.

More Enforcement Wanted by Drivers

A high proportion of participants wanted more law enforcement presence on the Beltway. None wanted less. Most participants acknowledged that law enforcement stops directly or indirectly cause some crashes, but they think that they prevent more crashes than they cause.

Most participants want law enforcement to give higher priority to unsafe driving, including excessive lane changes, cutting other drivers off, tailgating, and other violations they associate with aggressive driving.

Most drivers were not familiar with fines and points assessed for different violations. However, they generally think that sanctions should be tougher on habitual violators. Some also have the impression that the judicial system is too lenient with repeat offenders, granting hardship permits too readily when licenses are suspended.

Few drivers in any of the groups claimed to obey the posted speed limits. Most said they drive the Beltway at between 60 and 70 miles per hour when conditions permit. They do not think that these speeds are unsafe and count on law enforcement allowing 10 to 15 miles per hour tolerance. Almost all would agree that anything over 75 is unsafe. Some participants would like

the road to be posted at 65 or 70 and be strictly enforced. Others disagreed, maintaining that no matter what speed is posted, people will drive 10 to 15 miles per hour faster. Even the most aggressive drivers in the sessions think that speed enforcement is important, but the people who should be cited are those who drive at unreasonably high speeds.

Most participants agreed that slow vehicles can be a safety problem on the Beltway, but few would recommend increased enforcement of minimum speed laws. Both truck drivers and other motorists are more concerned when the slow vehicles block the passing lanes. Many would like laws, education, and enforcement that would keep slow vehicles in the right hand lanes.

The majority of participants (about 80 percent) claimed they always wear their seat belts. Almost all were in favor of primary laws for child restraints. However, many object to laws making failure to wear a seat belt a stopping violation. Some said that failure to wear seat belts is one of the minor violations, like expired stickers or minor equipment deficiencies, that does not justify the hazard caused by pulling a vehicle over on the Beltway. Others said that failure to wear a seat belt does not cause crashes and should be a matter of individual choice.

Awareness of the current enforcement campaign (Smooth Operator, April 1997) against aggressive driving ranged between 30 percent and 70 percent, depending on the composition of drivers in each group. The aggressive driver groups were more aware of the campaign than general drivers. Relatively few participants had unaided recall of the name Smooth Operator. However, most participants, even aggressive drivers, approved of it.

Several focus groups spontaneously suggested an activity similar to the proposed aggressive driver video imaging project. However, there are some people who think it is too intrusive and that citations issued to registered owners without identifying the driver will and should be dismissed in the courts.

Beltway drivers' suggestions to deal with the problem of excessive speed included:

- More law enforcement presence
- Photo radar
- Speed warning devices (saying "Your speed is XX mph--Slow Down")
- Higher speed limits, but with zero tolerance for violators of these higher limits
- Variable limits (responding to road conditions)
- Different limits for each lane
- Dummy law enforcement cars and drone radar

Incident and Traffic Management Issues Supported

Most participants believe that it is a good idea to immediately move cars involved in minor crashes out of the travel lanes. Most also are aware that the law requires it. However, most participants disagreed that cars left on the shoulder should be subject to immediate towing.

They do not think they pose a great hazard and believe that immediate towing would be unfair. The prevailing view is that owners should be allowed 24 hours to move the vehicle.

About half of the people know that there are motorist assistance patrols on the Beltway. Only one person in all of the focus groups said they had been stranded on the Beltway, and in that case, response was almost instantaneous.

Many participants own cellular phones and most of those knew that they could dial #77 to report non-emergency crashes. Some also said they could use the same number to contact law enforcement to report unsafe driving but this was not as widely known. Awareness of the #77 communication system was much higher in 1997 than it was in 1994.

Most participants were receptive to the advanced traffic management systems described to them but said they had not noticed any tangible evidence that they were working, so far.

Work Zone Issues Supported

Relatively few people believe that construction is a direct cause of many Beltway crashes. Most think construction leads to congestion and in that way may be an indirect cause. Most of the participants said construction signs give enough advance warning, although some said that traffic sometimes backs up beyond the signs, thus negating any advance warning. Others complained about false alarms, warning of construction that is not there when they reach the site.

Opinions were split about 50/50 regarding whether law enforcement presence should be required at major construction sites. Some people think it is a waste of money. Others think the sight of a flashing blue light calls attention to construction and helps slow traffic down to a safe speed.

Almost all participants claimed they slow down in construction zones but few slow down to the speeds shown on the signs. A few remarked that during rush hours a driver is lucky to get up to the posted speed in a construction zone.

Operation and Design Issues

Most participants think the Beltway is well maintained. There were scattered complaints about potholes and rough pavement.

Many differences were cited between Maryland and Virginia segments. Virginia was generally thought to have better merge lanes for traffic entering and exiting the Beltway. There also were comments that the width of the road is more uniform in Virginia, with fewer lane drops. Some people commented that they like the signs listing the next three upcoming exits in Virginia. The Springfield interchange, however, was mentioned by many as one of the worst areas on the Beltway. Maryland was mentioned by several as having more and better merge lanes

onto city streets at the end of exit ramps. Some also thought the pavement is better in Maryland. However, the curves near the Mormon Temple were frequently mentioned as a hazard. The I-270 interchange also was frequently criticized.

The general consensus was that lane markings are adequate when the weather is fair. There were some complaints that they are hard to see when it rains or snows. A few participants advocated raised reflective lane markers like the "Botts Dots" used in California. Others in the same groups argued that they would not stand up to DC weather, and snow plowing in the winter.

Neither creating additional lanes by narrowing existing ones nor utilizing the shoulders to handle rush hour traffic were thought to be good ways to relieve congestion. Additional lanes are strongly desired, but there was no support for building HOV lanes. Many participants commented that HOV lanes are a waste of taxpayer money that have failed to provide any substantial relief to congestion. Few participants car pool on the Beltway. Most of those who drive to work alone said they cannot find a partner who goes to work at the same time and place or they said that they need their car at work.

Some participants already use mass transit for their daily commute. Most do not have any form of mass transit available to them that can get them to and from work in anywhere near the time they can get there on the Beltway, even during rush hours. A few commented that between parking and fares, mass transit is too expensive.

There was almost universal support for the idea of building additional roads to take traffic off the Beltway. The most popular proposal was a bypass for I-95 through traffic.

Trucks and Cars Complain About Each Other

Both truck drivers and motorists complained about the need to drive on the Beltway together. Some motorists said they were nervous around the large trucks and take steps to distance themselves from the trucks. The truck drivers, on the other hand, think that most motorists do not understand that trucks need more room to stop and have blind spots where they cannot see smaller vehicles.

Trucks were mentioned as a hazard of driving on the Beltway in every group of Beltway drivers. One motorist had survived a crash in which she and her husband were forced off the road by a truck that changed lanes. One trucker reported a crash, years ago in which he drove off the road to avoid a car that changed lanes in front of him. Others told stories about near misses and aggressive driving by truckers. There also were complaints about debris falling off trucks and that trucks block the vision of drivers in smaller vehicles. However, only 2 percent of the 1997 participants (one person) identified trucks among the three things they believe are the most important causes of Beltway crashes, down from 14 percent in 1994.

Several motorists described the precautions they take around trucks. Some were very aware of where the blind spots are and that trucks are very difficult to slow down when heavily loaded. Yet others admitted to speeding up to prevent trucks from changing lanes ahead of them because they did not want the truck to impair their view ahead.

Awareness was very low for public information and educational campaigns that were supposed to better inform motorists about how to drive safely around trucks. The only group that had any knowledge of the "NoZone" campaign were the Roadway Express drivers because one of the participants in that group was filmed for the PSA produced for television. It evidently has received very little air time. A few more people were aware of an older campaign called Sharing the Road with Trucks, but knowledge of its content was superficial.

There was some support in the motorist groups for a rush hour truck ban on the Beltway. One person volunteered that trucks should be banned from the Beltway altogether. However, others in the group felt that truck bans might have serious economic repercussions. Truckers maintain that most people have no idea of the economic impact truck bans would have.

All the commercial drivers were aware of the left lane prohibition on the Beltway and most said it makes their job very difficult. Some said they are tempted, occasionally, to jump into the left lane but the fear of getting caught is enough to keep them from doing it. All were aware of the restriction of trucks carrying hazardous materials to the right two lanes of the Beltway. One driver disputes the wisdom of the rule, however. He contends that those lanes are the most dangerous lanes to be in because of more frequent lane changes as motorists approach their exits.

All of the commercial drivers claimed that the company they work for has an inspection program that exceeds the requirements. They prefer random inspections at the terminal to inspections at weigh stations or on the roadside. This is especially the case for drivers who are paid by weight or load because the time an inspection takes is money they do not make.

Most of the truck drivers have noticed the rollover prevention devices that have been installed on Beltway exits over the past couple of years. They generally do not perceive them as benefiting them personally because they are local and know which ramps can cause problems. They do believe the devices save lives and said there are additional locations where the signals would be beneficial.

Public Information and Education Issues

Participants get information on traffic conditions primarily from radio and TV traffic reports. Some also use and appreciate the information given on the variable overhead signs on the Beltway and major highways flowing into it. Most think the signs are helpful but some do not see them on the segments they travel and a few said they do not give enough information to really help. A few said they do not bother to look because the Beltway is always congested.

Two of ten people in the group in which the subject was covered said they have used their cellular phones to call AAA for traffic information. Neither has called the DOT. A few participants have sometimes attempted to tune in Traffic Advisory radio when the sign directed to do so. They had difficulty finding the station or getting clear reception.

Most participants said they take alternate routes when they know the Beltway is congested and can find an alternate. They acknowledged that it would help them if appropriate alternates were displayed on the variable signs.

Participants have noticed safety messages on the variable signs. The only campaigns that came to mind were about drunk driving and seat belts. They approve of using the sign boards for this kind of message.

Some participants, including truck drivers and other motorists, believe that licensing requirements do not assure that drivers are adequately prepared to drive on the Beltway. A few expressed concern that multi-lingual tests put people on the road who cannot read signs. Some think an insufficient amount of experience is required. Some suggested that continuing driver education should be required and that drivers should be re-tested periodically.

Detailed Findings

General Discussion

Pattern of Beltway Use

As shown in the following table, 33 of the participants in the current groups drive to work, although not necessarily on the Beltway or necessarily during peak hours. Only 25 of the participants in the current groups were on the Beltway during peak commuting hours. Counted in the number that do not drive to work are people who work at home, whether as a homemaker or in a home-based business. Although the ratio of participants who drive to work is reversed compared to the 1994 groups, it does not necessarily represent a change in commuting habits. It may be an artifact of the times the sessions were held. There was no afternoon session in the 1997 wave. The ratio using the Beltway during peak commuting hours is just about the same in the 1997 groups as it was in 1994.

Table 2. How Participants Use the Beltway.

Characteristics		General Drivers			Aggressive Drivers		Total (N=52)
		May 6 6:00 p.m. (N=11)	May 6 8:00 p.m. (N=11)	May 7 6:00 p.m. (N=10)	May 7 8:00 p.m. (N=10)	May 8 6:00 p.m. (N=10)	
Drive to Work?	Yes	6	6	9	6	6	33
	No	5	5	1	4	4	19
On-Peak Beltway Use?	Yes	5	5	6	5	4	25
	No	6	6	4	5	6	27
Beltway Segment	Northern	7	4	5	7	8	31
	Eastern	2	3	1	2	2	10
	Southwestern	6	6	6	2	3	23
	Northwestern	6	3	4	4	6	23
Number of Segments	One	6	7	5	6	4	28
	Two	1	3	4	3	3	14
	Three	3	1	1	1	3	9
	Four	1	0	0	0	0	1

More of the participants drive on the Northern segment of the Beltway (between I-270 and I-95 to Baltimore) than on any other. This is consistent with the 1994 study. Also as in 1994, relatively few of the current participants drive the Eastern segment (between I-95 from

Baltimore and the Wilson Bridge). For unknown reasons the proportions of participants who drive on the Northwestern segment (between I-270 and I-66) was somewhat lower among 1997 participants (44 percent) than the 1994 groups (75 percent). Travel on the Southwestern segment (between the Wilson Bridge and I-66) was somewhat higher in the 1997 groups (44 percent) than it was in 1994 (23 percent).

As in 1994, the North American Van Lines truck drivers were on all sections of the Beltway depending on the locations of pick-ups and deliveries. One of the Roadway drivers used the Southwestern segment of the Beltway all day, every day. The others ran only the short segment between Van Dorn and I-95 South. Skippy's Trucking drivers traveled both Western segments of the Beltway and also the Northern segment in Maryland. Sea Cap, which participated in the 1994 groups, covered all of the DC area from their terminal near Baltimore.

Reasons for Using Beltway

The main reason given for using the Beltway is that it saves time getting from one point to another. Participants perceive it as being quicker because there are no traffic lights and the speed limit is higher. Some participants added that they use the Beltway only when there is a time advantage. They seek alternate routes when they know there are delays.

Often the Beltway is the only way to get between Maryland and Virginia because there are few other ways to cross the river. A few people suggested alternate ways to cross but all agreed that unless Beltway traffic was really bad, the alternates often would require more time than waiting out traffic on the Beltway. Usually, it is the most direct route between destinations. Many participants remarked that their business takes them to other businesses located close to Beltway exits.

The reasons given for driving the Beltway did not vary much between groups and there were no discernible differences among general drivers, aggressive drivers, and truckers. The reasons given in the 1997 groups also were consistent with the reasons given in 1994.

Dislikes

No prompt was necessary to get the first group to talk about what they do not like about the Beltway. The first complaint was congestion. One participant said she had a love/hate relationship with the Beltway. She said, "It is like the girl who had a little curl on her forehead. When she is good she is very, very good, and when she is bad, she is horrid." Sometimes people can shoot right down the Beltway and get to a destination very quickly. Other times, they just sit for hours. Congestion and delays were also the first complaint in Group 2 and Group 3. Although congestion did not come up as early in the aggressive driver groups, it did come up as one of the major things they disliked.

One of the Group 4 aggressive drivers said that it is congestion that leads to all of the other things he does not like about the Beltway: unsafe lane changes, tailgating and general hostility. (Interestingly, aggressive driving behaviors did not come up this early in the three general driver groups.) An aggressive driver in Group 5 said she never likes the Beltway because it is always jammed with traffic. Another added that it is often backed up for no apparent reason. One of the men responded that it might be the result of the rubbernecking that happens every time a law enforcement officer pulls someone over. Another Group 5 woman complained that she does not know any good ways to get off when it gets jammed.

One woman from Group 1 complained that some spots on the Beltway are poorly designed. The spot that scares her most is trying to get from where the Clara Barton Parkway enters the Beltway to the exit to I-270. She says four lanes of traffic need to be crossed in a very short distance, and every time she crosses it she thinks she is taking her life in her hands. This brought up other spots participants felt were hazardous. One mentioned merging onto the Beltway from I-270. Another mentioned the Springfield interchange where traffic from the Beltway merges with traffic from I-95, I-395 and other major highways and there is an incredible amount of necessary lane changing to get in position to take a desired route. A woman in Group 2 said she thinks the Beltway is dangerous, especially the curvy sections. A woman who grew up in New Jersey agreed, saying that she thinks it is much more frightening than the Jersey Turnpike and most of the roads in the New York metropolitan area.

Group 1 also complained about exits with no merge lanes or short merge lanes onto surface streets. The example given was Democracy Boulevard. One participant said that if drivers do not yield, they probably will get hit by traffic from the surface street. If drivers stop, they will back up traffic on the ramp, causing a hazardous situation behind them. Group 4 (aggressive drivers) also complained about on-ramps, although the woman who volunteered the response was one of the three least aggressive drivers in the group. She said it frightened her a bit to merge into faster Beltway traffic. The woman next to her (who also was relatively low on the aggressiveness scale in this group) said she did not like merge lanes where cars were both exiting and entering the Beltway in the same lane, especially when the exits and entrances are close together.

Another complaint in the first group was HOV lanes. The general idea expressed by the group was that they are a big waste. It does not make sense to them that traffic should be at a standstill in the non-HOV lanes while there are hardly any cars in the lanes reserved for high occupancy-vehicles. One participant also complained that on roadways with a single HOV lane, traffic runs faster in the regular lanes than in the HOV lane, which lessens their ability to convince people to car pool. The HOV issue also came up in Group 5. One of the aggressive drivers in the group said, "It is maddening when the highway is choked and the HOV lanes are empty." He asked, "How long will it take before the government realizes that it is not working, that the theory does not fit the practice?"

Several members of Group 2 added that they think the road is confusing. In particular, some of them wished the signs would have directions on them (North, South, East and West) because they are not familiar with the place names, even though they have lived in the area for up to six years. The use of "inner loop" and "outer loop" on some signs also is confusing to some. One group member had to explain it to several other group members. Confusing signs also came up in Group 3. One example given was the directional signs entering the Beltway from I-95 in Maryland. The signs say "New Hampshire Avenue--Silver Spring" in one direction and "College Park--I-95 South" in the other direction. If drivers do not know where these places are, the man said, the signs are meaningless. Another Group 3 member said she thinks that designating the highway as I-95, I-495 and I-395 in different places also is confusing. Two of the aggressive drivers in Group 5 had a conversation about how strange and confusing the Beltway seems in the other person's state. Signs were blamed for a lot of the confusion.

The most aggressive driver in Group 4 said that he hates all the construction, particularly when it is done during the business day. (He uses the Beltway all day long to call on clients.) Someone else built on this idea and said that even more annoying are signs that warn of construction ahead when none is going on. Several others gave examples of cases where lanes were coned off and there was no construction.

A member of Group 3 brought up inattentive drivers as one thing he does not like about the Beltway. He says he often sees people reading newspapers as they are driving.

Group 5 generated a longer list of things they do not like about the Beltway. One man mentioned that his pet peeve is when people abandon cars on the Beltway during snow storms. Another said he hates the bridge painting that goes on every night when he uses the Beltway. Another man mentioned that the sun often blinds Eastbound traffic early in the morning, especially between Georgia and Connecticut Ave. A male driver from California said that there are two things about the California highways that strike him as superior to the Beltway. One is exit signs that constantly show the next three exits and the distance to them. The other is "Botts Dots," the raised reflectors between lanes that are easier to see in the rain and can be felt when a lane is accidentally crossed.

Trucks were mentioned among the initial dislikes about the Beltway only in Group 3. The woman who mentioned trucks said that many of them slow down traffic and they do not stay in the right hand lane when going slow. One of the men added that trucks stay out of the left lane, but unless drivers are comfortable going over 70 in the left lane, they are pretty much stuck behind the trucks. Another man added that sometimes truckers are aggressive and related a frightening experience when he passed a truck. The trucker got angry and tried to run him off the road. Poor brakes were also mentioned.

Generally, what commercial drivers like least about the Beltway is losing time in traffic jams. This is especially so for drivers who are paid by weight or load, rather than being paid hourly. The dump truck drivers from Skippy's trucking said they try to avoid the Beltway

during the peak hours because they do not want to get stuck in stopped traffic. One said he would drive an extra 20 miles per trip on surface roads to avoid the possibility of getting stuck up there because it could save him time.

Some of the commercial drivers complain that they do not like being prohibited from the left lane on the Beltway especially when there is slow traffic ahead of them, three abreast, and the left lane is running free.

Another dislike about the Beltway, especially for dump truck drivers, is that the road is very rough in sections. They say that truckers feel the bumps and potholes more than ordinary motorists. They wonder what the basis is for decisions on what section gets re-paved. They mentioned that Virginia is re-paving a section near I-66 that was paved recently and did not need it, while other sections like Telegraph to Van Dorn are really rough.

Perceived Safety on the Beltway

Overall Assessment

A few members of the first group said they were apprehensive about driving on the Beltway but none felt it was so dangerous that they would not drive it. One member of the group volunteered that it is no worse than similar kinds of interstate highways around other major cities. He said that the Beltway around Baltimore, for example, is no better. In agreement that the Capital Beltway problems are no worse than problems on urban interstates all over the country, another participant spontaneously referred to the current enforcement campaign on aggressive driving. He said that he thinks there are more drivers like that every year and that it is a nationwide problem, not one that is confined to the Capital area.

Group 2 thought the Beltway is fairly hazardous. When the subject was raised by the moderator, one participant after another recited something they personally felt to be dangerous about the road. One of the women in the group said she does not know whether it is the road or the drivers that make her feel threatened. However, none of the members of this group ever had a crash on the Beltway. One woman said her husband did. The car in front of him crashed into another and then somebody hit him. It was clearly a congestion related crash. The same woman also talked about a near miss in which her car was forced to the shoulder by a truck changing lanes. Three members of the group took the position that the Beltway was not especially dangerous compared to other urban interstates they have driven.

Reaction was mixed when Group 3 was asked how safe they think they are on the Beltway. The first to answer said he did not think there was anything inherently dangerous about the road but he sees a lot of unsafe driving on it. He says he likes to drive it at 65 or 70 and a lot of cars, weaving from lane to lane and cutting other drivers off, pass him like he was standing still. Several others agreed, one adding that it is even worse at night when he usually travels the Beltway than it is during the day. One of the women said that it is very dangerous in bad

weather when the aggressive drivers with 4-wheel drive vehicles act like they could stop on a dime. One member of Group 3 felt safer on the perimeter interstate around Atlanta than the Capital Beltway. He believes that it has been expanded more to keep up with the increasing traffic volume and has been better maintained.

When Group 4 (the first aggressive driver group) was asked how safe they felt on the Beltway, the initial response was "quite" safe and the body language of this group seemed to indicate that most of them agreed. However, one woman said that it is pretty hazardous during rush hours and tries to avoid using it during those times. Several other group members also talked about dangerous driving and design hazards that made them somewhat apprehensive about the Beltway. One of the moderately aggressive women said she does not believe the Beltway is any more dangerous than a lot of other highways in the area, I-395 for example. She continued that it is rush hour that is dangerous, not the Beltway itself. Another woman said that one of the things that makes it less safe than it could be are people who "drive scared" when they are on it.

Asked how the Beltway compares in safety with other interstates they drive, most members of Group 4 responded that there was not a lot of difference. One said that I-66, west of the Beltway is more dangerous to drive on than the Beltway itself because it is even more congested. Only one person in the group experienced a crash on the Beltway. He was stopped at the end of a ramp leading into University Avenue which has no merge lane. The car behind him was watching traffic on University and assumed he pulled out when there was a small break in the traffic, hitting him in the rear end.

Members of Group 5 (the group with the greatest tendency toward aggressive driving) were generally less concerned about the Beltway's safety than the other groups. The first member of Group 5 to speak about safety on the Beltway said that he thinks he is a bit safer on it than some other interstates because the congestion keeps the speeds down so that people rarely get killed when they crash. However, a second person said there are sections of the Beltway that are not very safe and mentioned the curves near the Mormon Temple. Next, someone talked about the danger of drivers who are not familiar with the Beltway.

Truck drivers expressed mixed opinions about safety on the Beltway. The Skippy's drivers said that the road gets less safe every day but they think it is caused by congestion, not by a change in the roadway or a change in driving behavior. Some North American Van Lines drivers also think it is getting more dangerous but at least one of them thinks it is less dangerous than city streets when driving a big rig. The Roadway Express drivers do not think the road is particularly dangerous but they see a lot of dangerous driving on it. Some of the drivers at North American believe that the Beltway is somewhat more hazardous to drive than other interstate highways they have driven. However, one driver said that the interstate around Atlanta may be worse. He said, however, that the drivers are more aggressive on the Capital Beltway.

Specific Hazards

One member of Group 1 said the major thing that makes the Beltway more hazardous than other urban interstates is the volume of interstate truck traffic on it. He would like to see a bypass that would take the I-95 through truck traffic off the Beltway. One of the women in this group remarked that trucks are frightening because they are so big and that it is hard to see around them. (This from the young female college student who says that trucks are about the only thing she worries about on the Beltway.)

Group 1 turned to unsafe driving behavior early in the discussion. One woman said that it is frightening to look in your mirror and see someone closing rapidly knowing that there is no way they can slow down enough to avoid hitting your car. They usually cut someone off to get into an adjacent lane and then cut back in front. Someone remarked that this is aggressive driving and added that it also occurs in merge lanes where this kind of driver has no regard for the hazards he is causing and just expects other drivers to keep out of the way. Another participant expressed annoyance that these drivers never merge until the last possible second. If a lane closes out, they often continue in it a mile past the warning sign because it is moving faster. Then they expect people who merged earlier to yield when they finally change lanes.

Although the current law enforcement campaign against aggressive driving was mentioned spontaneously in all groups, it came up earliest in Group 5 (the most aggressive group) when they were discussing their perceptions of the road's safety. The man who mentioned it said he thought that the number of drivers who cut other drivers off is increasing, not only on the Beltway but all over the country.

Inattention came up as a Beltway hazard in Group 1. A self-professed aggressive driver in this group said it drives him crazy when people drive 55 and pay no attention to traffic behind them, cutting in front of traffic that is moving faster without ever looking in their mirrors. The group chimed in with other examples of inattention, including reading newspapers while driving and talking on the phone.

Short exit ramps were mentioned as a hazard by one of the members of Group 3. He says that eight cars waiting to get onto Georgia Avenue can back cars up onto the Beltway. One of the women in Group 3 said she thinks there are several other design faults that are hazardous. She referred specifically to exits with no merge lanes onto local streets (Georgia Avenue is one of them), left hand entrances that merge into the fast lane, and places where several lanes of traffic must be crossed in a short distance in order to exit. One of the young aggressive males in Group 4 said that he thinks the curves in the area of the Mormon Temple are fairly dangerous. He said that traffic moves entirely too fast in that section. One of the particular complaints in Group 2 was lane drops. Another was left lane exits.

A Group 3 participant pointed out that one of the hazards of the Beltway that is different from other places is that there are so many out-of-town drivers, not only people from other parts of the country, but a lot of drivers from other cultures.

Trucks were mentioned by a member of Group 2 as making the roadway dangerous. One of the women in Group 5 also complained about truck drivers. She remarked that some of the most aggressive drivers she has seen are truck drivers who just bull their way through traffic, intimidating everyone else on the road. She also mentioned the frequency of truck roll-overs on Beltway exits, which she said she reads about every day. It bothers her primarily because it backs up traffic.

The hazards mentioned by commercial drivers are very close to the same as those mentioned by drivers of passenger vehicles. Aggressive drivers were mentioned in all three commercial driver groups as one of the Beltway hazards. One said, "They are just out there, hammer down, and act as if they do not even see you." Another trucker said that even non-aggressive motorists act as though they own the road and that trucks have no right to be on the road.

One of the North American drivers, an older man, said that he thinks the prevailing speeds are faster now than they were a few years ago. Traffic is moving at 65 to 70 miles per hour these days and that is faster than he is comfortable driving. Asked if truckers were partly to blame for the increased speed, he responded that he thought they were, especially drivers of dump truck and "roll off" trucks who get paid by the load. They want to move as many loads as they can so they have an incentive to push the limits. Later on in the discussion, however, another North American driver said that he did not think speed was a particular problem on the Beltway. He said that there is not much speeding going on during rush hours because traffic is almost stopped. Even when traffic is light, he says most people are driving 65 or 70, which is over the speed limit, but not dangerous.

Inattention also was mentioned by all three groups of truck drivers. They said they often saw motorists reading maps while driving on the Beltway and also people talking on cellular phones. The dump truck drivers said weather is a big factor that affects the safety of the Beltway. When it is raining or snowing, the road gets very congested and it is hard to see. "Rubbernecking" was identified as a safety factor on its own.

Perceived Crash Causes

As in 1994, each group was asked to make a list of factors they perceive to be major causes of crashes on the Capital Beltway. Then, each participant was asked to select up to three items from the list that he/she considers to be among the most important causes.

In the 1997 groups, unsafe driving behaviors continued to be the major concern of most participants. Driving conditions, including bad weather and traffic congestion, was the second

most serious category of concerns in the 1997 focus groups, followed by roadway design and maintenance factors, trucks and law enforcement (or lack thereof).

There was a perceptible difference between the proportion of 1997 and 1994 participants who designated one or more unsafe driving behaviors among the top three causes of Beltway crashes. In total, the 1997 participants designated about two items each from this category, compared to about one item each among 1994 participants. Excessive speed, aggressive driving, inattention, unsafe lane changing and tailgating were the most frequently designated behaviors in the 1997 groups. The major difference between the 1997 and 1994 groups is that aggressive driving was designated by 38 percent of the 1997 participants, up from only 2 percent in 1994. Also, far more 1997 participants (48 percent) identified excessive speed as a major crash cause than 1994 participants (23 percent).

Interestingly, the aggressive driver groups designated speed as a major crash cause more frequently (65 percent) than the 1997 general driver groups (38 percent). As might have been expected, fewer participants in the aggressive driver groups (15 percent) identified aggressive driving as a major crash cause than participants in the general groups (53 percent). Another marked disparity between the two types of groups was that 35 percent of the aggressive driver group members designated unsafe lane changes as one of their top three items compared to none in the general groups.

There was not much overall difference between 1994 and 1997 with regard to the proportion of participants who blamed driving conditions for crashes on the Beltway. There was, however, a difference in which conditions received focus. In 1994, 44 percent of the participants named congestion as a major cause of Beltway crashes. In 1997, only 23 percent did. Conversely, 37 percent of the 1997 group members said that bad weather was a major crash cause compared to only 9 percent in the 1994 groups.

In aggregate, roadway design and maintenance factors comprised the top category of crash causes among 1994 participants (designated "major" by 97 percent). In 1997, however, the category declined to third rank, with only 33 percent naming design and maintenance items as major crash causes. While shared acceleration/deceleration lanes (called "merge lanes" by most participants) remained the top item and did not change much. Construction, lane markings signs and lane drops declined sharply as major concerns.

There was also noticeably less emphasis on trucks in 1997 than in 1994. In 1994, 20 percent blamed trucks as a major crash cause. In 1997, the proportion declined to 4 percent.

The following table shows the percentage of participants who designated each item as one of the three most important causes. If an item was listed as a crash cause but no participants included it in their three most important items, it is represented as 0 percent. If an item was not mentioned by a group, it is represented as "—" in the table. It should be noted that when items are aggregated, they can and sometimes do, total to more than 100 percent because each participant could select up to three items.

Table 3. Perceived Causes of Beltway Crashes.

Perceived Crash Causes	Percent General Drivers (N=32)	Percent Aggressive Drivers (N=20)	Percent 1997 Total (N=52)	Percent 1994 Total (N=64)
Unsafe Driving (Cumulative):	166	205	181	95
Speed	38	65	48	23
Aggressive Drivers	53	15	38	2
Inattention	28	30	29	19
Car Phones	0	0	0	—
Moms Watching Kids	—	0	0	—
Unsafe Lane Changing	0	35	13	17
Weaving	—	0	0	—
Tailgating	13	15	13	2
Slow Drivers	0	20	8	3
Left Lane Etiquette	9	0	6	11
DUI/DUID	3	10	6	0
Tired Drivers	6	—	4	0
Rubberneckers	6	0	4	0
Indecisive Drivers	6	—	4	3
Unnecessary Braking	—	10	4	2
Not Signaling	3	—	2	0
Cutting Off Trucks	0	—	0	—
Not Yielding	—	5	2	2
Racing/Showing Off	—	0	0	0
Backing Up on Beltway	—	0	0	—
Not Moving Away From Safety Vehicle	—	0	0	—
Driving on Shoulder	—	0	0	—
Last Minute Lane Changes	—	0	0	—
Stopping in Merge Lane	—	0	0	—
Headlight Flashing	0	—	0	—
Timid Drivers	—	0	0	0
Menacing Drivers (Guns, etc.)	—	0	0	—
Revenge	—	0	0	—
Carelessness (General)	—	—	—	8
Driver Error (General)	—	—	—	5

Table 3. Perceived Causes of Beltway Crashes (Continued).

Perceived Crash Causes	Percent General Drivers (N=32)	Percent Aggressive Drivers (N=20)	Percent 1997 Total (N=52)	Percent 1994 Total (N=64)
Driving Conditions (Cumulative):	75	50	65	53
Weather	34	40	37	9
Congestion (Rush Hour)	31	10	23	44
Poor Visibility (Night)	9	—	6	—
Bright Sun	0	—	0	—
Roadway Design and Maintenance:	38	25	33	97
Merge Lanes (Shared Acceleration/Deceleration)	25	20	23	27
Construction	6	0	4	11
Ambiguous/Incorrect Construction Signs	—	—	—	3
Unclear Lane Markings	0	0	0	8
Confusing Signs	0	5	2	17
Inadequate Exit Signs	3	—	2	—
Road Design	3	—	2	—
On/Off Ramps on Opposite Sides	0	—	0	—
Springfield Interchange	0	—	0	—
Short Ramps/Clogged Ramps	0	0	0	—
Potholes	0	—	0	2
Exits With No Merge Lane	—	0	0	0
Lane Drops	—	—	—	9
Inconsistent Ramp Design	—	—	—	5
Poor Snow Removal	—	—	—	5
Debris on Road	—	—	—	3
Short Acceleration Lanes	—	—	—	3
Uneven Road (When Paving)	—	—	—	2
Other Design Features	—	—	—	3
Trucks (Cumulative):	3	5	4	20
Trucks	3	—	2	14
Debris from Trucks/Uncovered Trucks	0	5	2	—
Heavy Equipment/Large Vehicles	—	5	2	—
Trucks In Fast Lane	—	0	0	—
HAZMATS	—	0	0	—
Truck Maintenance	—	—	—	6
Law Enforcement (Cumulative):	0	0	0	2
Law Enforcement Activity	0	0	0	0
Lack of Law Enforcement	0	0	0	2
Speed Limit Too Low	—	—	0	0

Table 3. Perceived Causes of Beltway Crashes (Continued).

Perceived Crash Causes	Percent General Drivers (N=32)	Percent Aggressive Drivers (N=20)	Percent 1997 Total (N=52)	Percent 1994 Total (N=64)
Other:	6	0	4	2
Poorly Trained (Inexperienced) Drivers	6	—	4	2
Out of Town Drivers	0	0	0	—
Taxi Drivers	0	—	0	—
Foreign Drivers	—	0	0	—
Diplomats	—	0	0	—
Unsafe Vehicles	—	0	0	—
Not Wearing Seat Belts	0	—	0	—
Blind Spots	0	—	0	—
Media Activity	—	0	0	—

The following list of crash causes was compiled in the three trucking company groups. Interviewing conditions made it difficult to get each participant to designate his top three causes as in the driver groups, but it was accomplished in the group of dump truck drivers. The table shows the number of participants ranking each problem among his top three. In all other cases, the mention of each crash cause is shown as a check mark (✓).

Table 4. Perceived Causes of Beltway Crashes - Commercial Drivers.

Perceived Crash Causes	Skippy's # Serious	Roadway Express	North American
Dangerous Driving Behavior:			
Lane Switching	3	✓	✓
Speed	3	✓	✓
Aggressive Driving	2	✓	✓
Slow Drivers in Left Lane	2	✓	
Slow Drivers	1		
Irresponsible Drivers	1		
Tailgating	1		
Bumper Tag	1		
Fatigue (Truck Drivers and Others)	1		
No Turn Signals	✓		
Driver Rage	✓		
Shouldering	✓		
Lack of Anticipation	✓	✓	
Inattention		✓	✓
Failure to Yield		✓	
Blocking Trucks from Changing Lanes		✓	✓
Driving in Truck Blind Spot		✓	✓
Rubbernecking			✓

Table 4. Perceived Causes of Beltway Crashes - Commercial Drivers (Continued).

Perceived Crash Causes		Skippy's # Serious	Roadway Express	North American
Driving Conditions:	Congestion	✓	✓	✓
Roadway Design and Maintenance:	Woodrow Wilson Bridge	1	✓	
	Construction (Especially Daytime)	✓		✓
	HOV Lane Entrances and Exits (I-66)	✓		
	Springfield Interchange	✓	✓	✓
	Curves (Between I-270 and College Park)	✓		
	Washboard Pavement	✓	✓	
	Lane Drops		✓	
	Left Exits		✓	
	Narrow Lanes in Work Areas			✓
Law Enforcement:	Insufficient Law Enforcement Presence	2		✓
	Law Enforcement Stops	✓	✓	
	Blue Lights	✓		
	Cops Writing Warnings, Not Tickets	✓		
	Poor Law Enforcement Priorities			✓
Other:	Non-English Speaking Drivers	✓		
	Poorly Trained Drivers	✓		
	Disabled Vehicles in Travel Lanes			✓
	Large Recreational Vehicles			✓

Like other Beltway users, the truck drivers' list of crash causes was heavily weighted toward dangerous driving behavior. They were somewhat less inclined than other drivers to blame Beltway crashes on driving conditions but congestion was mentioned in every truck driver group. Roadway Design factors were mentioned fairly often in the trucker groups as they were among other drivers. Law enforcement (or the lack of it) was mentioned more among the truck drivers than among other drivers.

Solutions

Each of the groups was asked to spend a few minutes to suggest solutions to some of the problems that most members of their group had ranked among the top three causes of Beltway crashes. The content of these discussions is described below.

Aggressive Driving (Group 1)

The very first suggestion to deal with the problem was to put cameras on the overpasses, like those used to show traffic on the TV news, and send tickets to drivers who were observed doing bad things. (This was entirely spontaneous. The idea of "Aggressive Driver Imaging" as proposed by Maryland officials had not been discussed previously.) The second suggestion was

to encourage motorists to report aggressive drivers by making a free cellular phone call to law enforcement. The third was more law enforcement on the road so that aggressive drivers would believe there is at least a possibility that they could get arrested. The fourth suggestion was signs asking people to be courteous.

One participant advocated stronger sanctions against repeat offenders. He thinks that the root of the problem is the judicial system. He perceives that even when licenses are suspended, sympathetic judges will reinstate driving privileges if any kind of hardship is shown. This undermines the deterrent effect of law enforcement and hard core violators have no fear of any consequences from their actions. Not only would he like it to be harder to get a license reinstated, but he would like to see habitual violators go to jail.

The group's definition of aggressive driving included speeding, swerving, switching lanes without signaling, tailgating and headlight flashing. Other members of the group added taking revenge on other drivers, competitiveness between drivers and general rudeness. The most aggressive woman driver in the group remarked that the problem with the last few characteristics given by the group was that there is no law to punish stupid drivers, or being competitive, and there should not be. The second most aggressive driver in the group added that he felt that enforcement against aggressive driving should be objective, not subjective. He did not think people should be stopped for being angry or pushy, only for breaking traffic laws.

Aggressive Driving (Group 2)

Group 2 also designated aggressive driving as the most serious cause of Beltway crashes. Asked for suggestions to solve the problem, the first response was to keep better track of repeat offenders and to pull their licenses. Building on that, one woman said that stops should be made and tickets should be issued for every violation, not letting minor violations go by. She thinks the problem is attitudinal and that attitudes would be different if people had some fear that they could get arrested.

The Smooth Operator campaign was mentioned spontaneously by name as a good solution to the problem. Four of the ten members of this group said they were aware that the program is going on. One of the panelists who lives in Fairfax said that there is a "Zero Tolerance" campaign on the Fairfax County Parkway in which every violation, no matter how minor, will be cited by law enforcement. He said this is along the lines of what has been discussed in the group but he had some doubts as to whether it will work against aggressive drivers.

At this point in the discussion, the moderator asked if anyone in the group would characterize themselves as an aggressive driver. The question was countered by a question from the woman who had the highest aggressiveness score (9) in Group 2. She asked "What is an aggressive driver?" The group responded: people who change lanes without signaling, people who cut in and out of lanes trying to go faster than surrounding traffic, people who tailgate, and people who are obnoxious on the road.

The moderator asked the group how they individually deal with aggressive drivers. The most aggressive woman in the group said, "When someone tailgates me, I let them pass and then I tailgate them back." Several members of the group appeared to be a little shocked when she said it, and several said they might think about doing that but it is far too dangerous. One woman said she worries that if she retaliates, someone might shoot her or force her off the road.

Speed (Group 3)

Several members of the Group 3 said that the primary cause of the speeding problem is lack of enforcement. One said he thought the difficulty might be that the road falls in multiple jurisdictions, but whatever the cause, there is not enough law enforcement on the road. Another added that it is hazardous to stop people for speeding on the Beltway and that might be the reason there is so little enforcement. One woman said that she thinks it would help if there were just more law enforcement cars on the road, whether they stopped a lot of speeders or not. She said the mere presence of law enforcement slows people down. One of the participants suggested using photo radar and sending tickets to registered owners by mail. The expected objection to sending the ticket to the registered owner, rather than the driver, finally emerged in the discussion of this solution.

Speed (Group 4)

The aggressive drivers who comprised Group 4 also suggested more enforcement. One of the young males in the group (not the most aggressive) suggested something on the order of photo radar. The difference he envisioned was that the locations of the speed tracking devices would be all around the Beltway and be obvious to motorists. Ideally, they would let the driver know he has been "busted" immediately, rather than the offender just getting a ticket in the mail.

One of the Group 4 women said that she could not believe she was saying it but speeding fines should be higher. She thinks they are not high enough now to really deter speeding. Another woman said that she thinks the speed limit should be raised to 65 and strictly enforced. She also added that people who go less than 55 should be arrested too, because they are just as big a problem. The idea of raising the speed limit and strictly enforcing it was supported by several other members of the group.

One of the most aggressive drivers in the group said he thought that just more law enforcement cars on the road would help a lot. He asked the group how many had ever seen a law enforcement car on the Beltway? Another of the aggressive drivers responded that he had seen a lot more law enforcement just recently. He said maybe it was due to the current enforcement wave to arrest aggressive drivers. (This was the first mention of the campaign in this group and it was spontaneous.)

At this point, the older of the two men at the top of the aggressiveness scale said, "Is everyone crazy? I do not believe that anyone in this group wants more law enforcement on the

road. What should be done is fix the design problems with the roadway and if they enforce anything it should be getting the slow drivers out of the fast lane." One of the women said, "Yeah, I feel that way too, but the problem before us was what to do about speeding and I was just trying to help".

One of the women added that the solution might be to make public transportation more attractive so people who are afraid of speeds on the Beltway do not need to drive it. Someone responded that mass transit is an unrealistic solution because people want to drive just because they like driving.

Speed (Skippy's Trucking)

The dump truck drivers also think the only answer to the speed problem is more enforcement. One of the drivers said, "Lets face it, no one drives 55. There are hardly ever any police on the Beltway so everyone drives as fast as they can or as fast as they care to." One of the drivers suggested varying the speed limit on the road depending on conditions. He suggests letting the road run at 65 or 70 when there is little traffic and dropping the speed to 45 or 35 in bad weather or when there is congestion. He said he has seen it done elsewhere and it really works as long as the speed limits are reasonable and strictly enforced. The group also suggested photo radar, dummy cameras and even dummy law enforcement cars on the side of the road. They said Maryland was already using photo radar. Someone said that Virginia tried it and ran into trouble in the courts. It seems someone who got a ticket was able to prove he was out of town.

Unsafe Lane Changes (Group 5)

There was a three way tie among the most serious crash causes in Group 5. They were speed, unsafe lane changes and weather, each named among the three most serious problems by five members of the group. The moderator elected to go with unsafe lane changes first but it became obvious that the group did not want to solve the problem. On two occasions, someone diverted the groups attention to other issues.

When Group 5 was forced to return to the subject of unsafe lane changing, the group in essence, said nothing can be done about it. One man said, "Unless other people change their style of driving, I'm not about to." One of the other men added that it might be a little late to retrain "us" but it would help to train new drivers in safe driving techniques. A young women responded that the training kids get is OK. She said she used to be a careful and considerate driver when she was in high school. It is only since she became confident in her abilities that she became more aggressive. One of the group members suggested that it might help if drivers were re-tested before being allowed to renew their licenses.

One member reluctantly said that the only answer is enforcement. Several other group members agreed. One said that none of them would change their driving behavior unless they

felt there was a good chance they were going to get a ticket. However, one participant observed that aggressive drivers who use the road a lot know when law enforcement is on the road and where they will be. They think they can do anything they want without getting caught. It is the people who are unfamiliar with the road who get caught. At this point, one member proposed a solution that very much resembled the Maryland aggressive driver video imaging proposal. The group's reaction to the proposal is detailed in the law enforcement section of this report.

Unsafe Lane Changes (Skippy's Trucking)

The initial response to the lane switching problem was that additional laws are needed against aggressive driving. However, most of the group felt the problem could be addressed under existing laws against improper lane changing and all that needs to be done is to enforce them. One of the drivers knew about Smooth Operator and he thought it was a good thing. Another participant said there should be better enforcement of laws that require slow drivers to keep in the right lane and a lot more public education about them. He said that any driver with any sense should realize that if people are passing them on the right, they are going too slow in their lane and should move over to the right. He added that the same rule should apply to trucks. He noted that there are a lot of fellow truckers who block up the left lanes.

Inattentiveness (Group 3)

Group 3 spent a few minutes discussing driver inattentiveness, which tied with speed as the second ranked crash cause in this session. One member suggested that using cell phones while driving is one of the most common examples of inattention. Seven of the ten people in the group have cellular phones in their cars. One said he always pulls over before he uses his. Another said he has a "hands free" feature on his phone so he can talk with both hands on the wheel. Most of the rest admitted that they sometimes use their phones while driving. One remarked that talking on the phone is not very distracting in normal traffic but admits that she needs to take her eyes off the road to dial so she tries to dial while stopped in traffic or when there are no hazards she needs to pay attention to. No additional laws or enforcement actions were proposed by the group.

Congestion (Group 2)

The first suggestion the group made was to use HOV lanes for regular traffic. The person who put this forward said it is time for the government to admit that HOV lanes do not do what they were intended to do and these lanes would be better used to handle more traffic. Another person said that more lanes should be added. She pointed out an instance where an extra lane was recently added on a Beltway section. She said it makes a noticeable difference in the flow of traffic.

Another suggestion that came up spontaneously was to make public transportation an attractive alternative to driving. The woman who proposed it said that lack of parking at Metro

stations is a significant deterrent to using the system. She also said it appears that authorities are trying to make the public transportation system less attractive by raising prices (extending the hours that are considered "on peak"). Other deterrents to using mass transit are that it does not go where people need to be, it takes longer than driving (other than down town) and trains are not frequent enough. Although a few members of this group were aware of busses that would take them where they wanted to go, none take the bus because they would still have to pay for parking at the Metro station and buses are slower than driving.

Bad Weather (Group 3)

Acknowledging there was not much that can be done to change the weather, Group 3 applied itself to the problem of making the Beltway safer during bad weather. The first suggestion was doing a better job of snow plowing. Several participants said that they believe a better job of snow plowing is being done at present than was done in the past but plows could get out a little earlier.

Another participant said that he thought rain was more of a safety problem than snow. A woman suggested grooved pavement. A man said that reflective lane markers would help. There was some discussion about the difficulty of maintaining reflective lane markers in the area's climate.

Bad Weather (Group 5)

Although weather was tied with speed and unsafe lane changes as the most serious crash causes, one of the participants in Group 5 decided he wanted to talk about weather first. The group went along with it because, as aggressive drivers, they really did not want to talk about the other two problems.

The person who changed the subject wanted to get a second chance to sell the group on "Botts Dots" as lane markers, a subject he had previously mentioned. Another person in the group reacted, saying "Yeah, but the snow plows will rip them up." A third person said she thought they had already done it. Someone else said they tried recessed reflective markers and he understood that freezing water pushed them up and there are now potholes where the markers used to be.

One of the women said she liked the overhead signs that told people to slow down when the roads are slippery ahead. One of the men said that those signs are really dangerous because people actually do slow down, and those of us who are driving 70 pile into the back of them. Seriously, he said, he has seen three or four crashes in the area of the signs.

An additional suggestion was better driver training teaching new drivers that they needed to adjust their driving to accommodate bad weather. A participant added that special attention should be paid to making drivers aware that the road is slipperiest when it first starts to rain.

Truck Blind Spots (North American Van Lines)

The terminal manager said that North American Van Lines recently sent out a company-wide directive that convex mirrors (like those used on school busses) must be installed ahead of the cab on the right side of every vehicle. The drivers said it would help a lot, because it is impossible to see low objects on that side of the vehicle with the current side view mirrors. One of the operators also suggested that some kind of audible alarm, like a back up horn, should be installed about half way back on the trailer. He thinks this would help warn cars that they should either speed up or fall back if a truck does not see them and starts to pull over. Another driver added that the turn signals should be bigger and brighter, and perhaps be arrow shaped to give motorists better warning and fewer excuses.

Driver Training (Roadway Express)

Commercial drivers from Roadway Express believe that drivers should get better training. They do not think that regular driver training courses give new drivers enough time behind the wheel. Also, they are not taught many of the things commercial drivers are taught. One example is the "Smith System" which they said is looking and planning ahead as far as possible to avoid potential problems. They said it would be a good idea to require people to receive additional on-road instruction after they have been driving for a while to correct any bad habits they have developed. The truckers would be in favor of requiring additional on-road training periodically as part of the license renewal process. Courtesy ought to be one of the major elements of continuing driver education, according to these drivers.

Specific Issues

Aggressive Driving

As noted earlier in this report, there were distinctive differences in perceptions between the three sessions composed of a general mix of drivers and the two that were designed to represent aggressive drivers. To fully understand their perspective on other issues, it is helpful to compare the answers of drivers included in the "aggressive" groups to those in the "general" groups on the questions used to qualify drivers for inclusion in the aggressive groups.

The first two questions were designed to measure frequency of getting angry in driving situations. Although nearly all of the participants in both groups said they get angry when they are cut off by another driver at least sometimes, 55 percent of participants in the aggressive groups often or always get angry compared to only 37 percent of the general drivers. Only 38 percent of participants in the general groups admit that passengers sometimes tell them to calm down compared to 65 percent of the participants in the aggressive groups.

Participants in the aggressive groups also have a greater tendency to be impatient. Nearly all participants (95 percent) in the aggressive groups admitted that they often or always get impatient when behind schedule. This compares with only 33 percent in the general groups.

Similarly, 80 percent of participants in the aggressive groups get impatient when the car ahead slows down compared to 32 percent of the participants in the general groups.

On two questions designed to measure competitiveness, the question that asked how often they compete with other cars in traffic jams was discriminating. In the aggressive groups, 75 percent of the participants admitted that they often or always compete and none said they never do. The proportions are almost reversed in the general groups where 78 percent claim they never compete and the remainder admit to competing only sometimes. Only two of the 52 participants stated that they sometimes drag race at stop lights, and both were in Group 5.

There also was a difference between the general and aggressive groups on two questions designed to measure vindictiveness or actions taken to punish other drivers. Half of the aggressive drivers said they block cars trying to pass at least sometimes. This compares with only 19 percent of the general drivers. In the aggressive group, 40 percent sometimes block cars trying to change lanes compared to only 10 percent in the general groups.

Although there was a continuum of aggressiveness scores in both the general and aggressive groups (a third of the participants in general groups had scores that could have placed them in the aggressive groups), there was a discernible qualitative difference between the groups on a number of issues. It was noticed by the moderator and observers, as well as by the participants themselves. There were occasions in both of the aggressive groups where participants talked in terms of "us" and "them." When Group 4 was asked directly how many would confess to being aggressive at times, all but one raised their hands. The one man who did not raise his hand scored just over the threshold of qualification for an aggressive group. Later, he said, "If keeping people from cutting in line ahead of me are included, I am aggressive." Almost all members of Group 5 also admitted to being aggressive drivers.

The moderator asked Group 4 how they defined aggressive driving. One of the men simply gestured to the list of Beltway crash causes they had completed. Individual behaviors they named were weaving from lane to lane, cutting others off, tailgating, speeding, showing off, not allowing cars to merge in front of them and getting angry at other drivers. Everyone laughed when the moderator asked how many of them ever got angry on the Beltway. When asked how many ever made an obscene gesture to another driver, several said "Not any more." The implication was that they worry about retaliation.

Table 5. Responses to Aggressiveness Screening Questions.

Screening Question		General Drivers		Aggressive Drivers	
		Number	Percent	Number	Percent
You get angry when cut off ...	Always (3)	3	9%	2	10%
	Often (2)	9	28%	9	45%
	Sometimes (1)	18	56%	9	45%
	Never (0)	2	6%	0	0%
Passengers tell you to calm down ...	Always (3)	0	0%	0	0%
	Often (2)	0	0%	2	10%
	Sometimes (1)	12	38%	11	55%
	Never (0)	20	63%	7	35%
You get impatient when behind schedule ...	Always (3)	4	13%	6	30%
	Often (2)	6	19%	13	65%
	Sometimes (1)	19	59%	1	5%
	Never (0)	3	9%	0	0%
You get impatient when the car ahead slows down ...	Always (3)	2	6%	3	15%
	Often (2)	5	16%	13	65%
	Sometimes (1)	14	44%	4	20%
	Never (0)	11	34%	0	0%
You compete with other cars in traffic jams ...	Always (3)	0	0%	2	10%
	Often (2)	0	0%	13	65%
	Sometimes (1)	7	22%	5	25%
	Never (0)	25	78%	0	0%
You drag race at stop lights ...	Always (3)	0	0%	0	0%
	Often (2)	0	0%	0	0%
	Sometimes (1)	0	0%	2	10%
	Never (0)	32	100%	18	90%
You block cars trying to pass ...	Always (3)	0	0%	0	0%
	Often (2)	0	0%	1	5%
	Sometimes (1)	6	19%	9	45%
	Never (0)	26	81%	10	50%
You block cars trying to change lanes ...	Always (3)	0	0%	0	0%
	Often (2)	0	0%	0	0%
	Sometimes (1)	3	9%	8	40%
	Never (0)	29	91%	12	60%

Enforcement Issues

This topic was covered in detail in Groups 1, 2, 4 and 5, and all of the commercial driver groups. Relevant comments from Group 3 are included where appropriate

Adequacy of Law Enforcement Presence

In Group 1, five of the participants felt there was too little law enforcement presence on the Beltway. The remainder (6 people) felt the amount of law enforcement presence was just about right. Ensuing discussion revealed some dissatisfaction with the deployment of law enforcement. Several people mentioned that they did not believe it was effective when there were many law enforcement cars working the same area. They said they usually can sense that law enforcement is there by the way traffic ahead of them is behaving and they know that once they are past the pack of law enforcement cars they are home free. Most of the people in Group 2 also felt that there was not enough law enforcement presence on the Beltway. Group 3 was not asked.

Only three of the ten aggressive drivers in the Group 4 felt that there was not enough law enforcement on the Beltway. However, none thought there should be fewer. The rest accepted the moderator's observation that their silence must indicate that they know how to play the game with the existing amount of law enforcement presence. One woman said that she felt if there is a sufficient amount of law enforcement presence, there is a chance she could get caught and she avoids doing anything stupid.

Four of the ten aggressive drivers in Group 5, all women, felt that there was not enough law enforcement presence on the Beltway. However, none of the participants felt there was too much. One of the women who thought there should be more law enforcement remarked that there was a lot more law enforcement on the road around holidays and that really does reduce crashes and fatalities.

The majority of commercial drivers would like more law enforcement on the road. Although two of the six dump truck drivers said there are enough police out on the Beltway the rest believe there should be more. All agree that more stops should be made. In general, the dump truck driver felt that law enforcement is very tolerant, perhaps too tolerant to motivate people to respect the law. As professional drivers, they want to obey the rules but feel stupid obeying them when others flaunt them and get away with it. The van line drivers said they have noticed an increase in the amount of law enforcement presence on the Beltway but one said there still are not enough of them on the Maryland side.

Hazards of Law Enforcement Activity

Most Group 1 participants believe that law enforcement traffic stops on the Beltway create a hazard. They said it encourages "rubbernecking" and slows traffic to a crawl. One of the

participants also mentioned that the shoulders on the Beltway are not very good for pulling people over. The officer sometimes needs to walk the side line of the roadway to get from the police car to the car they stopped. One suggestion was to use the law enforcement car's public address system to direct the car to pull off at the next exit rather than stopping them on the shoulder. Most of the group felt that the idea of turning the blue light off when a car is stopped on the side would increase, rather than decrease, the danger of law enforcement stops although a few thought it might be a good idea if the cars were well off the road.

Most of the drivers in Group 2 also acknowledged that law enforcement sometimes create a hazard when they pull people over, but just seeing a law enforcement car on the road, or on the side of the road, has an effect on aggressive drivers. One went so far as to suggest posting "dummy" law enforcement cars around the Beltway. This group clearly believed that the effect enforcement has on driver behavior more than offsets any hazards created by making stops.

Most of the aggressive drivers comprising Group 4 believe that law enforcement stops on the Beltway creates safety hazards. They pointed out that it slows down traffic and promotes a lot of rubbernecking. None would take the position, however, that making law enforcement stops is so dangerous that law enforcement officers ought to stop doing it. Asked if it would be less of a hazard if officers turned off the blue light after they were out of the travel lanes, the prevailing view in this group was that it would not make much difference.

Several members of Group 5, including both men and women, acknowledged that law enforcement stops on the Beltway during rush hours is a cause of some crashes, and the rest of the group seemed to agree. Asked whether the increased hazard caused by law enforcement activity during rush hour is offset by other safety benefits, the first reaction was, "What would police enforce during rush hours? It certainly would not be speeding." Another participant argued that there is a need to enforce against aggressive behavior like cutting people off and "shouldering." He continued, "I'll bet there is not one of us who does not get a feeling of satisfaction when a cop pulls off a guy who has shouldered past us." One of the Group 5 participants said that it is always rush hour on the Beltway. Her position is that law enforcement is needed on the Beltway and if they are going to be kept from making stops during rush hour, there will be no law enforcement. One of the men said that he thinks there is too little enforcement at night when, without fail, he always sees two or three cars blasting past him at 90 to 100 miles an hour.

Most truck drivers acknowledge that law enforcement activity is the cause of some crashes. In general, however, they think the hazards caused by enforcement presence does not compare with the problems encountered without them. The Roadway Express drivers believe that law enforcement activity definitely does cause crashes, if not directly, as a result of rubbernecking and increased congestion. One of the ways law enforcement could improve the situation would be to insist that the cars they pull over get completely to the right edge of the shoulder so the law enforcement car can create the pocket needed for the officer's safety and still be out of the travel lane. The North American drivers suggested that there should be less enforcement at choke

points like the Woodrow Wilson Bridge and more patrol cars rolling where they can better enforce aggressive driving.

Support For Increased Enforcement Funding

Group 1 (the only group asked) was generally supportive of increased funding for law enforcement on the Beltway. However, several members said they were not for it if it meant that there would be more law enforcement giving tickets for going 65.

Enforcement Priorities

When directly asked what kinds of violations should be given highest priority, Group 1 responded with aggressive driving. Asked what specific violations they associate with aggressive driving, the group said improper lane changing, tailgating and excessive speed. Once again, one of the women in the group said that law enforcement ought to be able to arrest people who were shouting at each other, making rude gestures and generally behaving like jerks. Again, the driver with the second highest aggressiveness score responded that law enforcement cannot and should not arrest people for rudeness, only for breaking laws. One member of this group also said that law enforcement should enforce minimum speed laws.

The second group, like the first, listed dangerous driving behaviors as the kinds of violations they felt should get higher priority. Specifically, excessive lane changes, cutting people off, tailgating and sudden braking for no reason.

Even the aggressive drivers that comprised Group 4 said that excessive lane changing and excessive speed should have higher enforcement priorities. The aggressive driver who mentioned speed qualified it by saying he means speeds he thinks are excessive, 75 miles per hour or higher. One of the moderately aggressive men said he thinks law enforcement should go after drivers who are acting in a menacing way. Their violations might not be any different than those committed by less aggressive drivers, but these are the ones who should be stopped. Another moderately aggressive participant agreed. He said that law enforcement should target people who are trying to squeeze into spaces that are too small just to get ahead of someone else and drivers who take it upon themselves to punish someone else by doing something dangerous at 65 miles per hour. One of the women went on to say that drivers who behave that way are a lot more dangerous than people who are going 15 miles an hour over the limit.

Asked what violations should get higher priority for enforcement, the first person in Group 5 responded DWI. Her reasoning was that even though it is not one of the major causes of Beltway crashes, it often results in fatalities. One of the men thought that more emphasis should be placed on arresting drivers who are not paying attention. There was some discussion, and some dissension, about whether talking on a cell phone should be among the distractions that should be cause for a stop. The group came around to the conclusion that drivers should not be stopped for doing something other than paying attention to driving, only if it resulted in losing

control of the vehicle. One said there should be more enforcement of the child restraint laws. Everyone else agreed. Another Group 5 member said there should be more enforcement of seat belt laws. The moderator asked how many members of the group wear their belts all of the time. All but two indicated they did.

The kinds of violations the truck drivers think should get more attention are also primarily those associated with aggressive driving, especially cutting in and out between lanes and crossing three or four lanes at a time. The North American Van Lines drivers said there should be fewer stops for minor things like expired stickers and equipment violations on the Beltway. One of the drivers said they can do that on city streets where it is less dangerous and disruptive.

Sanctions

The people in Group 1 leaned generally toward harsher sanctions. Some suggested lowering the number of points at which a license is suspended. However, one participant remarked that sometimes drivers get a lot of points on local streets when they live in localities with overzealous law enforcement officers who make a lot of arrests for minor violations. He was not so sure that lowering the number of points at which a driver would be suspended was really a good idea. Some of the people in the group seemed to be more inclined toward giving more points for violations on the Beltway than on local streets but support for this idea was not universal.

Group 2 had some trouble grappling with the question of whether points and penalties should be increased on some kinds of violations because most of the group did not know what they are. The most aggressive in the group, definitely teasing, said, "None of us has ever received a ticket." Another group member said, "Yeah, right."

Like Group 2, Group 4 initially did not know how to answer when asked if they felt the sanctions for certain kinds of violations should be increased. They also claimed that they did not know what the fines and points were. They were educated by the most aggressive woman in the group who evidently had a great deal of familiarity with traffic courts. A woman who had previously said that the fines for speeding should be higher stuck with her position. One of the men said that fines for aggressive types of behavior should be higher than for speeding. Another suggested that points should be doubled for each successive violation so the system would be harsher on habitual violators. One of the problems, according to a couple of people in the group, is that courts are too soft on habitual violators who claim hardship and get a restricted license.

One of the men in Group 5 said that Virginia should make its sentences for drunk driving as tough as Maryland's. He said that most first offenders in Virginia get a slap on the wrist if there was no injury. In Maryland, all drunk drivers must attend a lengthy and time consuming series of classes and he thinks that really has an impact.

Speed Limit

Most of the people in Group 1 felt that 55 is too slow a speed to drive the Beltway except in congested areas and the curvy sections in the northwestern quadrant. Most felt that many sections could be safely driven at speeds higher than 55. The group was deeply split on the issue of how much tolerance law enforcement should give for driving faster than the posted limit. One member (again the second most aggressive driver) argued that the limits should be higher and law enforcement should give no tolerance. That way everyone would know the rules and there would be less speed differential between cars. He thinks the problem with the Beltway is that every person has his own interpretation of the rules. However, the prevailing view of the group seemed to be that 55 is an appropriate speed to be posted as a limit and that ten miles per hour is an appropriate tolerance.

Every member of Group 2 raised his or her hand when asked if the 55 mph speed limit on the Beltway is too low. However, one of the participants said he was not so sure his hand should be raised because he was concerned that if they made it 65, most people would drive 75. The conversation flowed naturally to a discussion about how much margin law enforcement allows over the posted limit. Some felt the limit should mean what it says. Others like, and count on, a 10 mph cushion. It was clear that most members of the group like to drive the Beltway at 65 if conditions permit it. All members of the group said that 75 is too fast for the Beltway. About half think 70 is too fast.

Most of the more aggressive drivers in Group 5 regularly drive the Beltway at 65 to 70 when conditions permit. None of them claimed to drive at the speed limit but none admitted to driving more than 70 either. Seven of the ten people in this group would like to see the limit raised to 65. Those who did not want the limit raised said that everyone would drive 75 and more lives would be lost. A couple who favor a higher limit disputed that. Their contention was that most people will not drive at speeds they think are dangerous. They think that few people believe they are safe going much over 70 on the Beltway and those are the same people who are driving at unreasonable speeds now.

One member of Group 5 suggested different speed limits for each lane, so every driver could find a lane that fit his level of comfort. Another group member jokingly said it would not work, though, because slow drivers never stay in the right lane even though there are signs all over the place asking them to do so.

Many of the truck drivers did not think that speed is a major problem on the Beltway. For example, some of the moving van drivers contended that traffic is under the speed limit when the road is congested and runs only between 60 and 70 when it is clear. They do not believe these speeds are especially hazardous. However, many support the 55 mile an hour speed limit, subscribing to the theory that people always run about ten miles an hour over the limit.

Slow Vehicles

About half of Group 1 believes slow vehicles are a major hazard on the Beltway. There was mixed reaction in the group as to whether there should be a minimum speed limit and the extent to which it should be enforced.

A few people in Group 2 said that the minimum speeds should be enforced more. There was disagreement in the group about what the minimum speed limit is on the Beltway. The lowest guess was 40. The most aggressive driver in the group said, "I thought it was 55." It is hard to tell whether she meant it or was just teasing.

There was a real discussion in Group 5 about whether people who drive too slow are as much a danger as people who drive too fast. Although all but a few members of the group believe that slow drivers are as great a hazard as speeders, a dissenter said that they do not cause as many fatal crashes as the speeders. One of the women, who happened to be fairly low on the aggressiveness scale, argued that it is slow drivers who clog up the lanes and create the conditions that motivate other drivers to engage in risky lane changes to get by them. The lone crusader in the group said that a car going 45 in the right lane is not as great a problem as a car going 55 in the left lane. All felt there should be some kind of minimum speed limit on the Beltway but they could not agree what it should be.

Commercial drivers in all groups mentioned slow drivers as a safety problem (particularly when they block up passing lanes) but they were reluctant to recommend enforcement of minimum speed laws. Part of the reason was a realization that they sometimes are the slow vehicles that people complain about. They admit that heavily laden trucks have difficulty coming up to speed when merging into Beltway traffic from short, uphill on ramps.

Occupant Protection

Group 1 did not understand the term "primary seat belt law." When it was explained that law enforcement can stop cars for a violation of the seat belt law, there was a great deal of opposition to it. All of the people in the group claimed that they always wear their belts but most were opposed to enabling law enforcement to stop people who did not use their belts. The debate on this issue was more spirited than any that preceded it. Those against argued that people who do not wear their belts are not hurting anyone but themselves and that enforcement of seat belt laws just takes resources away from other concerns that are more important.

All but one member of Group 2 agreed that failure to wear seat belts should be a stopping violation in all states. The dissenter obviously was not a seat belt user and gave several reasons why he believed not wearing a seat belt was safer than wearing one.

Half of the aggressive drivers in Group 5 were in favor of making failure to wear seat belts a stopping offense everywhere. One of the dissenters said that he thinks failure to wear a

seat belt is one of those violations that does not justify the hazard caused by the act of making the stop. He reasoned that the violator is not endangering anyone but himself. One of the pro seat belt people volunteered that she always wears a belt herself and would not move her car if a passenger is not buckled up. She said she is legally responsible for the safety of her passengers and will not assume liability for them if they do not buckle up. A few people in the group were shocked to learn that they had liability for unbuckled passengers and felt it was not fair because it was the passenger's decision that caused the problem.

Most commercial drivers believe in seat belts and have no problem with making failure to wear seat belts a stopping violation, but the North American Van Lines drivers also think it is one of those minor violations that does not justify pulling someone over on the Beltway. They said that failure to wear seat belts does not cause crashes. This is not the case with people who engage in dangerous driving behavior and that is who law enforcement should be stopping.

Awareness of Smooth Operator Project

Several members of Group 1 were aware of the current enforcement campaign against aggressive drivers. Those who were aware of it heard about it on TV news programs. None of the people in this group knew the name of the program -- Smooth Operator.

As previously noted, a member of Group 2 mentioned Smooth Operator by name when discussing possible solutions to the aggressive driver problem. Most of the members of this group were in favor of activities like this one.

Only three people in Group 3 were aware of the current enforcement campaign against aggressive driving. None of them had ever heard the name, although one said she remembered a public service announcement on TV with a policeman dressed as a Road Warrior.

When the moderator asked how many in Group 4 were aware of the current enforcement effort against aggressive driving, seven of ten raised their hands. However, none of them knew the name of the campaign. Several said they recognized the name Smooth Operator when the moderator said it.

Awareness of the current enforcement effort against aggressive driving was the same among the Group 5 aggressive drivers as those in Group 4, seven of ten. Several participants were aware that it was called Smooth Operator. The driving behaviors they associated with aggressive driving included speed, tailgating, "shouldering" and cutting others off. All but a few of the members of the group admitted that at times they were aggressive drivers. They continued, without prompting, to discuss why they drive aggressively. One young woman said she views driving as a competitive sport. Another woman said she gets aggressive when she is short on time and does not have the patience to wait. Others get angry at other drivers and want to teach them a lesson.

About half of the North American drivers knew about the aggressive driver enforcement wave that was going on when the session was held. Several had noticed more law enforcement out on the Beltway in the prior week. However, none had ever heard the name Smooth Operator. They said that campaigns like this do some good, at least while law enforcement is visible.

Reaction to Proposed Video Imaging Project

The proposed Maryland aggressive driver video imaging project was appealing to Group 1 which had "invented" it independently when asked to come up with solutions to the problem. However, the idea of mailing tickets to the registered owners of cars being driven aggressively triggered some reservations. One woman said she felt it would be more effective as a deterrent if drivers were stopped shortly after the violation was observed. Others felt it would be unfair to give the vehicle owner a ticket if someone else was driving the car, and some felt that law enforcement would have trouble getting convictions in court for this reason.

There was general agreement in Group 2 that it would be a good idea to use video images from cameras along the Beltway to ticket aggressive drivers. There were two or three people in the group who felt it was too invasive. Since the group was more strongly against aggressive driving than speed, some indicated that using cameras for aggressive driving enforcement would be OK but they would not want them used for speed enforcement and did not think photo radar was a good idea. This group did not discuss the issue of sending the ticket to the registered owner of the vehicle rather than the driver.

Initially, the proposal for video imaging of aggressive drivers seemed like a good idea to a few members of Group 4. Then, someone mentioned that they disagreed with tickets being sent to registered owners of the vehicles. There was a great deal of discussion about whether such a ticket could or should hold up in court. Finally, the most aggressive male who had not spoken since he asked the group if they were crazy for suggesting more law enforcement said, "This just goes over the top. We have enough big brother already." One of the women said that she disagreed.

The idea of using the Maryland highway surveillance system to detect aggressive drivers and send them tickets in the mail also came up spontaneously in Group 5 as they discussed possible solutions to the problem of unsafe lane changing. There was a great deal of discussion about whether such tickets would hold up in court since they would be sent to the registered owner, not the driver. It was as if the people in the room were rehearsing their righteous indignation against the time they would need to spend in court. One said that he thought it was not fair because out of town drivers would be likely to get off free. Another felt he should not be held responsible if someone borrowed his car. Yet another said the punishment does no good unless it immediately follows the violation, suggesting that law enforcement should stop the drivers observed on camera, solving both the driver identity problem and making punishment instant. In the end, four group members were in favor of the idea. The rest did not like it, but all thought it would be a very effective deterrent.

The Maryland aggressive driver video imaging proposal sounded like a very good idea to the truck drivers at North American Van lines. They thought, however, that there might be a problem making the tickets stick if drivers of the vehicles could not be identified. The terminal manager said that he would not have a problem with the idea of the company getting tickets because they know who is driving, and they would take action. However, he said it could be unfair to the owner of a vehicle that is stolen.

Radar Detectors

Only two people in Group 4 (which was the only group asked) felt that Maryland should enact a radar detector ban like Virginia's. They happened to be the two women at the low end of the aggressiveness scale. None of the group members would admit to having a radar detector but one man said he used to have one. He does not use it any more because it is more trouble than it is worth. He said he was driving down the highway at 70 thinking he was safe because he had the detector on when he was caught by VASCAR. No one in the group had an objection to law enforcement using drone radar to slow down people who have detectors.

Incident and Traffic Management Issues

This topic was discussed fully in Groups 2 and 4 as well as in one group of commercial drivers.

Moving Disabled Vehicles

Seven of the 11 people in Group 2 were not aware that the law requires cars involved in minor collisions to be moved off the roadway. All but one thought it was a good idea. Interestingly, it was the most aggressive driver in the group who said, "If it was not my fault, I would insist that the cars be left just as they were, so I could prove it to the police and insurance company." She did see the point, though, that it would be safer and reduce traffic congestion.

All members of Group 4 agreed that it is best to get cars out of the travel lanes after a crash if at all possible. Most were aware that this is the law. Group 4 was very negative, however, to the law making unoccupied cars on the shoulder subject to immediate towing. Everyone in the group was so set against this that the moderator had to play devil's advocate to get any kind of discussion going. They acknowledged that vehicles on the shoulder disrupt the flow of traffic but blame rubberneckers, not the unfortunate motorist whose car broke down. They think motorists should be given 24 hours to get the car off the Beltway before authorities can have it towed.

All of the North American Van Lines drivers knew that the law requires vehicles involved in crashes to be moved out of the travel lanes immediately if it is possible. Several said they had seen the signs to that effect. All think it is a good law. Although this topic was not covered specifically among the drivers at Skippy's trucking, some of those drivers said that one of the

things they do not like about the Beltway is that a fender bender can shut down the whole west side of the Beltway. It is reasonable to assume that they would be in favor of this law.

Pedestrian Problems

Although several members of Group 2 had seen pedestrians along the Beltway at one time or another, only one had ever seen a situation that he considered dangerous. In that case, a pedestrian ran from the median to the shoulder. However, all agreed that the problem of pedestrians does not compare in magnitude to the other safety hazards they had listed.

Only one Group 4 participant ever saw a situation where there were pedestrians on the Beltway. In this case, there were two people walking next to the median, close to the fast lane. The man who saw it thought it was very dangerous and could not imagine what the people were doing there. None of the North American drivers have ever encountered a dangerous pedestrian situation on the Beltway.

Motorist Assistance

Three members of Group 2 were aware of the motorist assistance patrols on the Beltway. One had a satisfactory experience with them. He said he once ran out of gas and had barely coasted to the shoulder when the assistance vehicle pulled up behind him. The rest could not recall ever seeing motorist assistance patrols and concluded that if they had never seen one, there could not be enough of them.

Most of the people in Group 4 had some awareness that there are motorist assistance patrols on the Beltway. A few said they see them often in Virginia. They would be very pleased with the service if help arrived within a half an hour. They would not be upset if it took an hour.

One of the moving van drivers spontaneously mentioned the motorist assistance patrols earlier in the discussion. He said he sees them often on the Virginia side of the Beltway. One of the drivers said that Maryland has them too but he does not think they have as many.

Reporting Non-Emergency Incidents

Five members of Group 2 have car phones. None knew that crashes or dangerous situations could be reported to the authorities by dialing #77. One, in fact, called 911 when she had a minor collision. When the group was asked if they had ever seen the call #77 signs on the side of the road, a couple said, "Oh yeah, I just did not think about them."

Of the seven people in Group 4 who had cell phones, about three knew how to use them to notify law enforcement of crashes or bad drivers. One woman had trouble thinking of what to dial although she says she sees it on a roadside sign every day. One cell phone user thought 611 should be called. None in the group have ever dialed #77 to notify law enforcement.

Before this topic was ever mentioned by the moderator, the North American Van Lines terminal manager noted that the Virginia State Police do a great job of responding to cellular phone reports on dangerous drivers. One rush hour, he personally dialed #77 to report a driver who cut him off. The Virginia State Police pulled the guy over before he was three miles down the road.

Advanced Traffic Management Systems

When the potential high-tech traffic management solutions were explained to Group 2, they seemed passive about it. The only part of the system they have noticed so far is the congestion advisories on the overhead variable message signs. However, one panelist noted that there is always congestion so the sign is always the same. She said that the sign occasionally says to tune in Traffic Advisory Radio but she always has trouble tuning it in. She is afraid she might have a crash while trying to find it on her radio dial. None in the group noticed any reduction in congestion over the past couple of years, except the relief they experience when each construction project is completed.

Work Zone Safety Issues

Motorists in Groups 2, 3 and 4 discussed this topic in depth. It also was discussed in one of the truck driver groups.

Construction As a Cause of Crashes

None of the people in Group 2 thought that construction itself was a major direct cause of Beltway crashes. They did say that construction is a big contributor to congestion and congestion is a major cause of crashes. They said that it would certainly help to reduce congestion if construction were not done in the day time, and particularly not during rush hours. One man noted that night time construction has its own hazards. He remarked about a particular situation, encountered over a long period of time, where the construction lights were blinding.

Unlike Group 2, Group 3 felt that construction is a major cause of Beltway crashes even though this group had not come up with it in their list of Beltway crash causes. To deal with the problem, the group felt more construction should be done at night. Other than that, their only suggestion was that more advance warning should be given. Group 3 indicated that construction delays are very annoying but attempts to probe the group's limits of patience were unsuccessful.

Most of the people in Group 4 did not rank construction as one of the major causes of Beltway crashes. Although construction was mentioned as a crash cause in all of the truck driver sessions, it was not discussed much. The only comment of note was that one driver said narrowed lanes in construction zones sometimes pose a problem for large trucks.

Adequacy of Warning Signs

It was the general consensus of Groups 2, 3, and 4 that construction warning signs are adequate, and they know about construction far enough in advance to take evasive action. One participant complained that there were too many "false alarm" signs left in place when there is no construction. Above all, motorists want the messages to be accurate. Another person remarked that occasionally traffic will back up long before the warning signs.

Law Enforcement Presence in Construction Zones

Group 2 felt that law enforcement presence at construction sites is an unnecessary waste of resources. They would rather see law enforcement on patrol. Conversely, most members of Group 3 were in favor of having law enforcement in major construction zones. They said that the flashing blue lights call attention to the construction sites, slow traffic down, and are especially needed at night. There were a few in the group who thought that law enforcement presence usually is not necessary.

Speeding in Work Zones

Almost all Group 2 and 3 participants said they slow down in construction zones, but admitted they do not slow down to the posted construction zone speeds. Some remarked that traffic does not allow them to go that slow, others said the posted speeds are often unnecessarily low. Some say it is like the speed limit -- no matter what speed is posted, people will go 10 miles an hour faster. They do slow down more when they see a law enforcement car in a construction zone. There were mixed opinions in the group as to whether the speeds currently posted in construction zones are realistic. Some of the group members have empathy for construction workers and think it is a dangerous job.

It was very difficult to get Group 4 to warm up to the topic of construction at all until the issue of speed in work zones was raised. All of them claimed to slow down in work zones, although none claimed to slow down to the posted speed. One of the participants who travels the Beltway mainly in rush hours said it is rare to get up to the posted speed limit. Another participant (the most aggressive woman driver) said that she thinks the posted speeds are reasonable because traffic only poses a danger to workers when they are separated from traffic just by cones. She thinks that the posted speeds could be safely higher where workers are protected by barriers. When asked whether double fines in work zones have any impact, one of the most aggressive males said it has no effect. Another said it got his attention.

Operation and Design Issues

Details of this topic were discussed by motorists in Groups 1, 3 and 4. The topic also was covered in one of the commercial driver groups.

Maintenance and Repair

Two of the three groups are satisfied with how well the Beltway is maintained and specifically mentioned improvements within the last three years. In Group 1, however, initial reaction to the question, "Do you think the Beltway is kept in good repair?" was "no." Several people in Group 1 said it is much better than it was in the past. One person remarked that during heavy construction last year the road was terrible but is much better now. Another person disliked the uneven lanes during re-paving. Another individual complained specifically about undulations in the pavement between the Van Dorn exit and the Wilson Bridge. Others complained about potholes and bumps.

People in Group 3 generally think the Beltway is well maintained. One person remarked that it is amazing that it can be as well maintained as it is, considering the amount of traffic on it. Another said that he frequently drives visitors from other countries around the Beltway and they often remark about what a good road it is. Group 4 also felt the Beltway is in pretty good repair. One participant said the expansion joints are a bit rough on some bridges but otherwise it is good.

The Roadway drivers say they think that the Beltway is very well maintained and the road conditions are better now than they were three years ago. The road has been widened in many places and changes have been made in ramp design to make them safer. The Dulles airport pick up driver appreciated the fact that a new right exit has been opened to I-66 since he complained about the left exit three years ago. However, the dump truck drivers said the whole Beltway is rough, with a lot of bumps and potholes. They focused on one particular section that "bounces the rear wheels up off the ground" between Van Dorn and Telegraph Road. This same section was mentioned by the Roadway drivers at the terminal on Van Dorn. They said a driver lost his trailer there when it bounced off the fifth wheel.

Differences Between States

When Group 1 was asked if they noticed any differences in the roadway when they passed from Maryland to Virginia, and vice versa, the initial responses were in regard to the condition of the road. The first remark was that the road was noticeably rougher on the northbound side in Virginia from I-66 up to the bridge. Someone else said they felt that Virginia did a better job of warning about construction ahead. Another person remarked that Maryland could do a better job of lane marking. He would like to see raised reflective lane markers like they have in California, particularly in Maryland where the road is curvy near the Mormon Temple. It was noted that the raised markers might also be a deterrent to excessive lane changing because the bumps, felt while changing lanes, are annoying.

One of the members of Group 1 mentioned that he liked the on-ramps better in Virginia. He liked the fact that traffic merging onto the Beltway was completely segregated from Beltway traffic until the entering traffic gets up to speed. On the subject of design, the woman who

previously pointed out the problem of needing to cross multiple lanes in too short a space to get from the Clara Barton Parkway to I-270 re-argued her case. Others supported her and pointed out that it is just as bad getting from I-270 to the Parkway. It was also claimed that the problem is the result of a recent extensive re-design of the I-270 interchange which was supposed to make the interchange safer.

When members of Group 3 were asked what differences they noticed between the Maryland and Virginia portions of the Beltway, the first thing mentioned was the sharp curves in Maryland. Next, the signs that list the next three exits in Virginia. One woman said that she has not noticed similar signs in Maryland and wished they had them because they are very helpful. When prompted, someone said that Virginia had longer and better ramps than Maryland. Someone also responded that the merge lanes were better in Virginia than Maryland and the on-ramps are longer allowing greater opportunity to safely merge into traffic.

Some in Group 4 said that, overall, they thought the Beltway in Virginia was better designed. One man said what he liked was that the ramps and merge lanes are better so that merging is less of a problem. A woman added that, overall, the Virginia section seems less curvy and more spacious. She continued that Virginia also was more uniform in width than Maryland with fewer lane drops to think about. No members of the group indicated a preference on signs or lane markings. Several said that they did not notice much difference.

Lane Markings

Other than having trouble seeing lane markings in bad weather, as previously mentioned, Group 3 thought both states did a good job with them. They said they have always been good and have not noticed any recent changes.

Creating More Lanes

While all groups favored adding additional travel lanes, all were equally adamant against narrowing existing lanes and opposed HOV lanes. They supported using the shoulder during rush hours. Group 1 acknowledged that while these measures would move more traffic, they seem less safe. One woman noted that longer acceleration lanes would help more with the congestion problem than additional travel lanes. In general, they said that HOV lanes do not stimulate enough car pooling to fill a lane. One member of the group car pooled in the past and another is considering it but none currently do. Car pooling had nothing to do with being able to use HOV lanes, but rather the economic advantages of commuting to the same place at the same time with a friend. One of the participants praised Virginia for changing lanes that were previously HOV-3 to HOV-2. His reasoning was that getting one friend to car pool is much easier than finding two. He thinks that the HOV lanes are better utilized since the change went into effect.

Group 3 also thought narrowing lanes to create more traffic lanes was laughable. They were a little less derisive about using the shoulder as a travel lane but the idea was not warmly

endorsed. The group was generally in favor of building additional lanes where possible but strongly rejected the concept of making them HOV lanes. Several members of the group gave impassioned responses regarding HOV, believing that they are a waste of taxpayer money and a contributor to congestion.

Group 4 also was negative toward the idea of creating extra travel lanes by narrowing existing ones. They also rejected the concept of using breakdown lanes as travel lanes during rush hours because it makes them nervous. If new lanes are built, this group, like the others, did not want them to be HOV lanes. Their reasoning was that most Beltway use is suburb to suburb and there are not enough people going to the same place to make car pooling feasible for most Beltway users.

Rush Hour Tolls

Group 3 (the only group asked) strongly rejected the concept of rush hour tolls as a method of reducing traffic congestion. One participant pointed out the toll booth backups that occur on the toll road near Dulles Airport as an example of why the toll strategy would be counterproductive.

Mass Transit Solutions

One member of the first group said he takes the Metro to work all the time. It saves, he said, wear and tear on both the car and the driver. Another man said he takes the Metro when the weather is bad. Although the Metro stops are very convenient both to where he lives and where he works, he prefers to drive when weather permits because he believes it is less expensive. Most of the people in the group did not take mass transit because there is no service to the places they need to go. A few others cannot take mass transit because of the need to use their cars as part of their work.

None of the members of Group 3 take public transportation to work. A couple tried it. One stopped doing it because it was too expensive. Another said he needs to get from place to place during his working day and to try to do so using public transportation is exhausting. A third says he used to take the Metro when he lived close to a Metro station. Now, it would take twice as much time to take the Metro as it takes to drive.

Mass transit was not an option for most of the people in Group 4. With one exception, those who can take mass transit do so. The one woman who could use the Metro and does not said it is too expensive. If it were as cheap as driving, she would do it.

Additional Highways

Group 3 supported the idea of building additional roadways to take the traffic pressure off of the Beltway. One participant favored an I-95 bypass to take the North/South through

traffic off the Beltway. Another participant suggested that a new East/West route across Montgomery County is greatly needed. Group 4 also seemed to be in agreement that more roads should be built to take pressure off the Beltway but did not make any specific suggestions.

Truck Related Issues

Truck related issues came up in all of the motorist focus groups but the specific issues listed under this topic were covered systematically among motorists only in Group 4. All of the commercial driver groups discussed the longer list of issues under this topic.

Motorists' Perceptions of Danger

The subject of trucks as a danger on the Beltway came up early in every group. Group 1 participants engaged in a long digression about them while discussing potential solutions to aggressive driving. The woman with the highest aggression score picked up on the group's interest in trucks and remarked that what made them dangerous was that they have huge blind spots. One of the men in the group related a story about a truck driver who forced the truck into his lane. He had been driving in the same spot, about in the middle of the trailer, for a long time. He felt that the trucker must have known he was there and this was just aggressive driving on the part of the trucker. Another participant observed that tailgating is especially dangerous when the vehicle doing it is a truck because trucks are extremely difficult to slow down and require greater following distances than cars.

The moderator asked Group 1 if truck drivers were more aggressive than drivers of passenger vehicles. Those who gave any indication of how they felt were shaking their heads to indicate "no." The man that had pointed out the danger of truckers tailgating cars sprang to the truck drivers' defense. He said truck drivers actions that might seem aggressive to people who do not know about trucks were things truckers need to do to get where they need to go. For example, he said, "How many times has a trucker been seen signaling that he needs to change lanes for a mile and no one will fall back to give him a gap to get in? It gets to a point that he just needs to force his way in."

When the moderator introduced the topic of trucks on the Beltway to Group 4, the first person to respond said, "Don't get me started." She continued that trucks frighten her and she reads about horrible crashes caused by trucks all the time. Four of the five women in the group said they did not like being near trucks on the highway, one saying that she always fears that they have not seen her in their mirrors.

Motorists in several groups also mentioned that debris falling or blowing from trucks was a hazard. Several mentioned that they needed to replace windshields as a result of pebbles hitting them when they were following a truck. Others complained that trucks blocked their vision of the road ahead. A woman in Group 3 said that trucks slow down traffic and they do not stay in the right hand lane while going slow. One of the men added that trucks stay out of the left lane

but unless drivers are comfortable going over 70 in that lane, they are pretty much stuck behind the trucks. Another man in Group 3 added that sometimes truckers are aggressive and related an experience of a trucker who got angry at him when he passed. The trucker retaliated by trying to run him off the road. Poor brakes were also mentioned.

A member of Group 3 remarked that he felt a lot of truck drivers were not really qualified to drive that type of vehicle. He clarified his remark by saying that he was referring mostly to straight trucks that do not require a Commercial Drivers License.

Motorists' Precautions Around Trucks

One of the men in Group 4 said that he is very aware that truck drivers cannot always see a car in their mirrors. He tries to avoid being alongside trucks for long periods of time and will either speed up or drop back if he thinks there is a danger that the truck does not know he is there. The most aggressive of the women drivers in the group said she makes a conscious effort to avoid being in the blind spots. Her understanding of where they are was correct as she demonstrated by drawing a diagram on an easel pad.

The woman who originally complained about trucks in Group 4 confessed that she sometimes speeded up to get around trucks and get away from them. When questioned about whether she returned to her normal speed when she got around a truck, she claimed that she maintained her increased speed for quite a distance because she did not want to be right in front of them either. She evidently is not the kind of driver truckers complain about -- those who speed up to get around and then get in their way.

The moderator told Group 1 that truckers complain that cars that have been following actually speed up to close the gap when trucks signal a lane change. When the group was asked if speeding up so a truck cannot change lanes is a form of aggressive driving, most group members indicated it was. However, one woman tried to justify the behavior by saying that she did not like to be behind trucks because she could not see around them.

Motorists' Awareness of Truck Safety Campaigns

In Group 4, the only group asked, none of the members of the group was aware of the "NoZone" public information campaign to educate people about truck blind spots. However, several of the group members were vaguely aware of the "Share the Road" slogan.

Motorists' Views on Truck Restrictions

A few members of Group 4 said they felt trucks should be restricted to the two right lanes on the Beltway. Another volunteered that trucks should be kept off the Beltway altogether during rush hours. However, a couple of people said they felt this is too extreme, saying it probably would have a lot of economic impact. One of the women in the group said that the hazard of

trucks on the Beltway might not be as great as people think. She said that she personally has seen a lot of crashes on the Beltway but never one involving a truck except on TV. One of the Group 4 members said it would be a good idea to restrict trucks to speeds under 65. He was actually a bit shocked to learn that the national speed limit for trucks is 55. When he recovered, he said that it should be enforced.

Truckers' Awareness of the "NoZone" and "Share the Road" Campaigns

The Roadway Express drivers knew all about "NoZone" because one of the focus group participants and his truck were filmed for the video that appears on TV. (It was transformed into a computer animation as it appears on TV). The driver said he has only seen it once, at about midnight, on an obscure TV station. The Roadway drivers think the message is good, but unfortunately, the public does not have an opportunity to see it.

None of the dump truck drivers were familiar with "NoZone," although some were vaguely aware of the "Share the Road" campaign. They were more familiar with the signs the truckers put on their rigs that say "If you cannot see me in my mirrors, I cannot see you."

One of the North American participants said that he had seen "NoZone" on a sign somewhere, but the rest of the drivers did not know what the word meant and had never seen it anywhere. When the moderator explained what "NoZone" was about, even the driver who thought he had seen it on a sign backed off what he said. Several had heard about the "Share the Road" Campaign. Perhaps the reason they knew about it was because it had been discussed briefly in the 1994 focus group session.

Commercial Drivers' Comments on Truck Restrictions

The commercial drivers in all groups were aware of the left lane restriction and HAZMAT restrictions on the Beltway. They do not like the left lane restriction, especially when there are slow vehicles, three abreast, in front of them. One driver said he thinks motorists do that on purpose because no one wants to be behind a truck. Some said they want to jump into the left lane occasionally but most think it is not worth the risk of getting caught.

One of the Roadway drivers said he did not understand the logic of lane restrictions for HAZMATS. He thinks they are at least as likely to crash in the two right lanes as in the left. One of the drivers observed that the right lane is the most dangerous lane a truck can run in. His point was that there is a lot of merging going on in that lane with cars exiting and entering the Beltway.

The general reaction of truck drivers to motorists suggestions that trucks be banned from the Beltway or banned altogether was that it simply cannot be done. The Roadway driver who spends most of his workday on the Beltway thinks it would be great if he could work at night when there is no traffic. The problem with that is that customers are closed at night. One driver

claims that the economy of the DC area would simply come to a standstill. The economic impact of adding hours to delivery times is just beyond the understanding of most motorists. They have no idea about what it costs to keep a truck running every hour it is on the road or what percent of the price they pay for things they need is the cost of transporting the product.

The dump truck drivers complained that they are misunderstood by the general public. People have no idea what truck drivers can and cannot see. They also have no appreciation for the length of time it takes to get a truck up to speed or slow it down. They believe that dump trucks get a bad rap about cargo flying off the trucks. These drivers said they always use their tarps but a certain quantity of flying stones is unavoidable. Some stones kick up from the road but the motorist thinks they come from the truck. Some come off the tailgate when hauling asphalt -- state rules prohibit the use of fuel oil as a solvent to remove stuck material because it degrades the next load of material.

Truck Drivers Views on Vehicle Inspection

The Skippy's Trucking drivers said that the current level of inspections their equipment gets is appropriate. Every truck is inspected by the driver daily and the state requires an annual inspection of every vehicle. These drivers said that the threat of random state inspections at the terminal is real enough to the company that it does a good job of self inspection and keeps the trucks well maintained. Their mechanics go over each truck each weekend to make sure everything is up to code. They said their company gets fewer random inspections than companies with a bad safety record and that is a powerful incentive to run a clean operation. From a driver's point of view, they like frequent inspections because their job is easier and safer if they are driving well maintained equipment. Between inspections at weigh stations or highway pull-offs and on-premises inspections, they prefer the on-premises inspections. One reason is that it does not disrupt their work. These drivers are paid by the ton, and stopping for inspections takes money out of the driver's pocket as well as their employer's. Another is that there is no way to evade inspections done at the terminal but is relatively easy to avoid a weigh station. They say they do it all the time. Word gets out very quickly among truckers and it "does not take a genius to figure out a way to find another route."

The North American trucks are inspected every six months, per company policy. This is in addition to the annual state inspection. Just about all of the drivers in the group had been pulled off for inspections at weigh stations. Although they get a sticker that is supposed to save them from being pulled off again for a while, Maryland and Virginia do not honor each other's stickers. Drivers say they sometimes get pulled off by one state shortly after they have been inspected by the other state. Like the dump truck drivers, they hate to get pulled off the road. When asked how they felt about the frequency of inspections, one of the owner operators in the group said it is too frequent and it is really a pain getting stopped in each state when he is on a road trip. The terminal manager said that on-the-road inspections have not been a big problem for the company since they rarely have a violation that puts them out of service.

Truck Driver Opinions on Roll Over Prevention Devices

The Skippy's drivers were aware of the truck rollover warning devices that have been installed on some Beltway ramps over the past several years. They think there are still some ramps that do not have them where they would be of benefit. Since they were local drivers, they generally knew which ramps were a problem. They do not think the devices help them personally but could save the lives of some interstate truckers who might be surprised by the tight radius of some ramps in the dead of night. One driver said it is funny to watch the reactions of four wheelers when a truck behind them trips the weight actuated warnings. They get on the brakes in a hurry because they probably have been on the ramps many times without seeing the signs light up. Only one North American driver had noticed any of the truck rollover warning devices that have been installed on some of the ramps. He said there is one at Van Dorn.

Public Information and Education Issues

Specific issues listed under this topic were probed systematically only among Group 3 motorists and in one group of commercial drivers. References are made to some of these issues in other groups where they came up in general discussion.

Getting Traffic Information

Group 3 participants were asked how they obtained information on traffic conditions on the Beltway. Several responded that they listen to traffic reports on the radio and also on TV news. One said he occasionally uses his cell phone to get traffic information.

Variable Overhead Signs

When prompted, most of the members of Group 3 said they look at the variable overhead signs on the Beltway for information on hazards and road congestion ahead. Most participants indicated that the signs are helpful but there are not enough of them. The group did not think that the signs cause a safety problem.

However, one participant remarked that the signs are hard to read at Beltway speeds because there is not enough time to read a sufficient amount of information to be really helpful. One said he did not know of any such signs. (Evidently there are none on the Beltway section he travels.) A participant in another group thinks they are dangerous because they are distracting. One of the women in the group said the information is sometimes in error. She said the sign she passed on the way to the group indicated that two lanes ahead were closed, but by the time she got there, they were open. In a couple of other groups, people remarked that they do not even look at the signs anymore because they always tell about the same congestion day after day.

Traffic Information by Phone

Two of the Group 3 members occasionally used their cellular phones to get traffic information (seven group members had cell phones). Both said that the source they called was AAA. They do not totally trust the information they get, remarking that all sources are somewhat unreliable because traffic conditions change so quickly.

Traffic Advisory Radio

A few of the Group 3 participants acknowledged that they have tried tuning to Traffic Advisory Radio when directed to do so by signs on or around the Beltway. None had satisfactory experiences with it. One said he could not find it. Another said it was too weak to be easily heard. A third said that the problem is that the broadcasts are on AM radio and he suggested that FM would be better. The person who remarked that the broadcast was hard to hear said he does not bother to tune in anymore because it only takes one or two unsatisfactory experiences to realize that it is a waste of time.

Use of Alternate Routes

Most of the Group 3 participants said they take alternative routes when they know about congestion in advance. However, one member remarked that there are no reasonable alternatives to cross the Potomac. They acknowledged that it would be helpful if information on alternative routings were given on the variable overhead signs and Traffic Advisory Radio, subject to the limitations in these media. The discussion shifted, momentarily, to in-car navigation systems which one of the group had mentioned as a hopeful solution to the problem of finding alternative routes. Another group member said he worried about that as just one more distraction to drivers.

Familiarity with Highway Safety Messages

When asked what highway safety messages they had seen or heard in the past few years, the group responded that they were aware of campaigns against drunk driving and messages promoting seat belt use. (Asked how many wear seat belts every time they drive, only three members of Group 3 did not raise their hands.) Another participant added that she had seen some messages promoting use of child restraints. When prompted, most members of Group 3 remembered having seen or heard the theme "Drive to Survive." Every member of the group claimed to remember "Buckle Up, It's the Law." None had heard the theme "Sharing the Road with Trucks." None were familiar with the term "NoZone."

Use of Variable Overhead Signs for Safety Messages

All of the members of Group 3 supported using the overhead message signs to communicate safety reminders but one man remarked that he did not think it would do much good.

Perceived Adequacy of Licensing Tests

Members of Group 3 did not believe that new drivers are adequately prepared to drive on the Beltway. One member remarked that one of the problems in the DC area is the problem of language. If multilingual driver tests are given, how can we be sure that drivers can read the road signs? Someone else said she thought that drivers who move in from other states and other countries should be re-tested before getting a DC, Virginia or Maryland license. The group was in general agreement that all drivers should be given a road test in order to renew their licenses.

Some of the commercial drivers also thought that licensing requirements are insufficient. Roadway Express drivers' suggestions are shown in detail in the section on solutions. The Skippy's Trucking drivers disagreed with the policy of giving drivers license exams in foreign languages because they felt that the drivers would not be able to read road signs. North American drivers complained that drivers of large recreational vehicles were a safety hazard because they are not required to have a CDL, even though the vehicles are the size of a large truck.

Perceptions About Driver Training

When probed, Group 3 initially thought it would be a good idea to include experience driving on the Beltway as part of driver education programs. On consideration, however, a few members of the group expressed the reservation that having a lot of trainees out on the Beltway might add to the problem. The general consensus in the group, though, was that requirements for experience behind the wheel are insufficient. One woman added that the instructor her son had was incompetent.

Truck drivers also had a few thoughts about driver training. One Roadway driver advocated that all driver training should include the "Smith System" (see section on solutions). Commercial drivers from several companies suggested that motorists should be required to have additional training to renew their licenses.

APPENDIX A

Beltway Users Discussion Guide

Beltway Users Discussion Guide

Introduction: [2 Minutes]

1. Identify PRG, NHTSA and Capital Beltway Safety Team.
2. State purpose of the session:

The subject of our discussion will be the Capital Beltway. In particular, we want to know what you perceive to be the major problems with using the Beltway--especially the problems which relate to your safety, to get your suggestions as to how some of these problems might be solved, and to discuss your reaction to some issues which have been defined by the Capital Beltway Safety team.

3. Make respondents aware of recordings and observers behind the glass.
4. Assure participants of confidentiality.
5. State Ground Rules:

Feel free to state your point of view.
Speak up.
One at a time.
Role of moderator.

Self Introductions: [10 minutes]

Ask each participant to state name, occupation, place of residence, location of work, how they get to and from work, how often they drive and/or car pool on the Beltway and indicate the section of the Beltway they use most.

Perceived Problems: [30 minutes]

1. What are your reasons for driving on the Beltway? Why use it instead of other roads? What do you like about it? What else?
2. What do you dislike about it? What else? (*Probe thoroughly.*)
3. How safe do you feel while driving on the Beltway? How does it compare to other interstates you drive? Does it seem to be getting safer, or less safe than it was, say five years ago?

4. How many of you have been in crashes on the Beltway? How many have had near misses? (*Probe: What happened? If a crash, was a police report filed? Any Injuries and damages? What caused it?*)
5. What do you think are the major causes of Beltway crashes? Why do you think so? Any others? (*List on Flip Chart. Probe thoroughly.*)
6. What locations on the Beltway do you consider to be particularly hazardous or susceptible to accidents? Why? (*Add new items to list.*)
7. What kinds of roadway design, marking, signage and roadway maintenance situations do you feel make the Beltway less safe than it could be? (*Add new items to list.*)
8. What times of day do you think crashes are more likely to occur? Why? Do you feel that the causes of crashes different at different times of day? In what way? (*Add new items to list.*)
9. What driving behaviors do you feel are major causes of crashes on the Beltway? Which ones do you think are a bigger problem on the Beltway than other roads? Why? (*Add new items to list.*)
10. Do you think that certain types of drivers or types of vehicles pose greater safety risks on the Beltway than others? Which ones? Why?
11. (*If not mentioned in 9 or 10*) How important a safety hazard do you feel that so called "Aggressive Driving" is? What driving behaviors do you associate with aggressive driving? (*Probe Speeding, Tailgating, Frequent/Abrupt lane changing, and erratic maneuvers if not mentioned.*) Which of these behaviors do you feel are most threatening?
12. Are you aware of any differences between the Maryland and Virginia portions of the Beltway that you believe may cause confusion or create hazards? What? Why?
13. Before we move on, what other safety problems can you think of on the Beltway?
14. We are going to spend some time talking about what can be done to solve some of the highway safety problems you have identified. I'd like each of you to pick out two or three items from the list that you think are most important. (*Work around table. Tally next to items identified.*)

Suggested Solutions: [20 minutes]

Now, I'd like to get your ideas about what could be done to help solve the problems you have identified as being important. For the time being, I don't want you to worry about whether or not your ideas are practical. We are looking for creativity here, and I want everyone to feel that is safe to venture ideas that at first may seem "off the wall" If somebody ventures an idea that you disagree with or think is impractical, I don't want to hear you tear it down. I do want to hear your comments which build on an idea or improve it.

(Start with the problem most participants identified as being important and work through the list. Stay with an item only as long as ideas are flowing. Address as many items as time allows.)

Safety Team Issues: [30 minutes]

At the beginning of the session, I mentioned the Capital Beltway Safety Team. The Team is composed of DC, Maryland Virginia and Federal officials with responsibility for highway safety. The Team's mission is to develop an integrated, regionally coordinated approach to improving safety on the Capital Beltway and they are charged with developing new strategies to improve the safety and functionality of the Beltway. Members of the Safety Team have asked us to get some specific feedback from Beltway users to help them accomplish their mission.

(Ask about as many areas as time permits, rotating order to ensure that all areas are covered in an equal number of groups.)

Enforcement Issues:

1. In general, how do you feel about law enforcement presence on the Beltway, How many of you feel that there is too little? How many feel that there is too much? How many feel it is about right?
2. Do you think a safety problem is created when a law enforcement vehicle is stopped along the Beltway? Do you feel that the safety benefits of law enforcement traffic stops on the Beltway justify any increased hazard they create? Does it seem to be better or worse if the law enforcement vehicles flashing lights are on?
3. How many of you would support increased funding for Beltway law enforcement? What would be the best way to pay for it? Which do you feel would be fairest, tolls, gas taxes, increased auto registration fees or increased fines?
4. What kinds of violations would you like law enforcement officers to make higher priorities, that is, what kinds of arrests would have the greatest impact on making the Beltway safer? Why? *(Ask other participants.)* What do you think?

5. What do you think the fines and points for traffic violations currently are? To what extent do you think they affect driver behavior on the road? Why? (*Ask other participants.*) Should penalties be higher on the Beltway than on other roads? (*Count noses.*) Why?
6. How many of you feel that the posted speed limit on the Beltway is too high? How many feel it is too low? How many feel it is about right?
7. How strictly do you feel that the posted speeds are being enforced? How much tolerance should officers allow before pulling speeders over?
8. How many of you feel that Maryland should enact a radar detector ban, similar to the bans in Virginia and DC? Why? Why not? If a radar detector ban is not passed in Maryland, how many of you would be in favor of using "drone radar" which generates false alarms on radar detectors?
9. How would you feel about using video cameras (an automated system which takes pictures of cars that are speeding, tailgating and making abrupt lane changes on the Beltway) to issue tickets to the registered owners of the vehicles? Any other views? How many are for and against?
10. Do you feel that slow moving vehicles are as much of a hazard on the Beltway as those driving too fast? How many of you feel that Maryland should have a law similar to Virginia's which requires that slow vehicles, moving 10 MPH below the speed limit, must keep in the right hand lane?
11. What does the term "primary seat belt law" mean to you? Among Maryland, Virginia and the Capital District, what is your understanding of where not wearing a seat belt is a stopping violation? How many feel it should be a stopping violation everywhere?
12. Have you noticed any recent changes in the level of law enforcement activity on the Beltway? How long ago? Do you know the names of any such programs?
13. How many of you have heard about a law enforcement activity called "Smooth Operator". What do you think are the purposes of the program? What do you think the short term and-long term effects of the program will be?

Incident and Traffic Management:

1. How many of you think it is illegal to move vehicles involved in accidents from the travel lane before law enforcement arrive? How many are aware that the law requires you to move them if practicable? Do you think is a good policy? Why?

2. Have you ever encountered a situation where there were pedestrians on the Beltway? Was it a safety problem? Where and When?
3. What is your reaction to making disabled or abandoned vehicles on shoulders subject to immediate towing? Why? How many of you favor changing laws and procedures to authorize this?
4. How many are aware of motorist assistance patrols on the Beltway? Has anyone in the group had a personal experience with them? *(If yes)* How long did it take them to respond? What would you do if help did not arrive in 15 minutes? What if it was a half hour or an hour?
5. How many of you have a car phone? Does anyone know what number to dial to report a non-emergency accident? (*77 in Virginia, #77 in Maryland)
6. Highway planners are working on longer term high tech solutions to managing traffic on the Beltway, involving traffic sensors, TV cameras, computers, data links, control centers, etc. The objective would be to manage the flow of traffic by doing such things as changing speed limits and use of lanes on the Beltway and major access and egress roads, as well as possibly controlling traffic signals. How much will this help? What problems, if any, do you think these kinds of systems might create for motorists? Parts of the system are already functioning. What changes have you noticed? Do you think it is helping?

Trucks:

1. How do you feel about trucks on the Beltway? What are the dangers associated with trucks? What kinds of trucks pose the greatest danger?
2. What kinds of precautions do you take to avoid collisions with trucks?
3. How many of you have heard about a public information campaign called "NoZone?" What is your perception of the objectives of the program? How effective do you feel it has been?
4. How many of you have heard of an educational campaign called "Share the Road?" What do you think that means? How effective has it been?
5. Should trucks be subject to special restrictions on the Beltway? What existing restrictions are you aware of? What kind of additional restrictions would do most to improve safety? *(Probe: lane prohibition, lower speed limits, cargo restrictions, increased inspections, banning slow trucks (e.g. dump trucks), rush hour bans.)*

Work Zone Safety:

1. *(If not previously discussed)* How important is construction and maintenance work on the Beltway as a cause of crashes? Why? What could be done to make construction and maintenance less of a problem?
2. How annoying are construction delays? How many minutes of construction delay does it take to change you attitude from mere annoyance to anger? Is your threshold of tolerance different at different times of the day?
3. What are your feelings about the present adequacy of warning signs, barriers, pavement marking, flagging, etc. at work Zones? Do you usually know about major construction well in advance of coming to it? How do you find out about it? What improvements would you suggest?
4. What do you think of a proposal to require law enforcement presence at all major Beltway construction sites?
5. At present, how realistic are the speed advisories at work zones? How many of you slow down some? How many of you slow down to the posted speeds? Would your behavior be different if law enforcement were present? If posted speeds were higher, would you slow down less? How many know that speeding fines are higher in a work zone? Now that you know, will you still speed?

Operation and Design Enhancements:

1. Do you feel the Beltway is kept in good repair? What particular maintenance problems, if any have you noticed?
2. What differences do you notice in highway features (including signs and markings as well as the roadway and ramps) when you pass from Maryland to Virginia or vice versa? *(For each item mentioned)*, Which do you feel is better and why?
3. Do you ever encounter problems seeing lane markings and other pavement markings on the Capital Beltway? Under what conditions? Do you feel this is more or less of a problem than it was a few years ago?
4. It has been suggested that congestion leads to accidents, and one way to help relieve congestion might be to narrow the existing lanes to create one more lane? What do you think of this idea? What would you think about converting the right shoulder, or breakdown lane into a travel lane?

5. How do you feel about high occupancy vehicle lanes? How many people should be required in a vehicle to be lawful in an HOV lane? Why? Would you support construction of an HOV lane on the Beltway?
6. It has been suggested that a lot of Beltway congestion could be relieved by enhancing traffic management on arterial streets connecting with the Beltway, creating what highway planners call "Super Arterials". This might involve limiting access to surface streets and changing signals on them to give priority to rush hour traffic entering or exiting the Beltway. What locations do you know of where this would be a major benefit? What kinds of disruption in local traffic would you envision?
7. Another suggestion to reduce congestion is tolls on rush hour traffic. What effects do you think this would have? How high a toll would it take to reduce or change the timing of your Beltway use? What do you think toll collection would do to the flow of traffic? How many of you are for and against this?
8. How many of you car pool, at least occasionally, to commute to and from work? How often do you do it? What are the advantages? What are your reasons for not car pooling?
9. How many of you use mass transit, at least occasionally to get to and from work? How often? What are the advantages? What are reasons for not using mass transit? What kind of service would need to be available to get you to switch from driving to using mass transit?
10. It has also been suggested that additional highways are the only or best way to substantially reduce Beltway congestion. How many of you favor building new major highways for that purpose? In what particular corridors or locations do you believe they would be most beneficial?

Education and Public Information:

1. How do you go about getting traffic information about the Beltway, that is, what are your sources of information? What sources are most helpful? What kinds of information would you like?
2. How satisfied are you with information from electronic signs on the roadway? Should there be more of them? Where? Do any of the signs themselves cause safety problems? (*get explanations*). Which type is better, overhead signs or ground mounted signs? Why?
3. How many of you have ever called the VDOT or AAA traffic information numbers? How often? How helpful is the information?

4. In your travels, how many of you have been exposed to TARS (Traffic Advisory Radio System), where you can tune in a special station dedicated to highway condition messages on your car radio? How often do you tune in to those on the Beltway? How helpful is the information?
5. If you find out about traffic problems in advance, do you try to take alternative routes? Would it be helpful if alternatives were suggested to you? Should electronic signs be used for this purpose?
6. Other than in this room, what highway safety messages or slogans can you remember being exposed to in the past year or so? (*Unaided Recall.*)
7. How many of you remember hearing or seeing the following safety campaign slogans or themes: (*Aided Recall.*) "Drive to Survive"? "Buckle Up, it's the Law"? "Sharing the Road with Trucks"? Other messages remembered by participants?
8. What kinds of media do you feel would be most effective in reaching you with these kinds of messages? Do you feel it is appropriate to use variable message boards on the Beltway for these kinds of messages when not being used for urgent warnings?
9. How many of you feel that the Driver's License Tests in your state assure that drivers have the knowledge and capabilities needed to drive safely on the Beltway? What changes would you suggest? How many feel that drivers should be re-tested? Under what circumstances? To what extent do you feel that Beltway drivers are self-selecting, that is, drivers who are not capable of handling the Beltway tend to stay off it?
10. What, in your view, should driver training programs teach students about driving on the Beltway? How do you feel it should be taught? What should new drivers be taught about trucks? Do you think that knowledge about trucks should be included in licensing tests?

APPENDIX B

Beltway Truck Driver Discussion Guide

Beltway Truck Driver Discussion Guide

Introduction: [2 Minutes]

1. Identify PRG, NHTSA and Capital Beltway Safety Team.
2. State purpose of the session:

The subject of our discussion will be the Capital Beltway. In particular, we want to know what you perceive to be the major problems with using the Beltway--especially the problems which relate to your safety, to get your suggestions as to how some of these problems might be solved, and to discuss your reaction to some issues which have been defined by the Capital Beltway Safety team.

3. Make respondents aware of recordings.
4. Assure participants of confidentiality.
5. State Ground Rules:

Feel free to state your point of view.
Speak up.
One at a time.
Role of moderator.

Self Introductions: [10 minutes]

Ask each participant to state name, place of residence, and destinations on a typical working day. Ask them how they use the Beltway on a typical working day, what times they are on the Beltway and what sections they travel. (A large outline map of the Beltway might be used so subjects could mark the area they use on the map).

Perceived Problems: [30 minutes]

1. What are your reasons for driving on the Beltway? Why use it instead of other roads? What do you like about it? What else?
2. What do you dislike about it? What else? (*Probe thoroughly.*)
3. How safe do you feel while driving on the Beltway? How does it compare to other interstates you drive? Does it seem to be getting safer, or less safe than it was, say five years ago?

4. How many of you have been in crashes on the Beltway in either a truck or your personal vehicle? How many have had near misses? (*Probe: What happened? Was a police report filed? Any injuries and damages? What caused it?*)
5. In general, what do you think are the major causes of Beltway crashes? Why do you think so? Any others? (*List on Flip Chart. Probe thoroughly.*) How about Beltway crashes which specifically involve trucks? Lets make a list of the causes of truck crashes.
6. What locations on the Beltway do you consider to be particularly hazardous or susceptible to accidents? Why? (*Add new items to list.*)
7. What kinds of roadway design, marking, signage and roadway maintenance situations do you feel make the Beltway less safe than it could be? (*Add new items to list.*)
8. What times of day do you think crashes are more likely to occur? Why? Do you feel that the causes of crashes different at different times of day? In what way? (*Add new items to list.*)
9. What driving behaviors do you feel are major causes of crashes on the Beltway? Which ones do you think are a bigger problem on the Beltway than other roads? Why? (*Add new items to list.*)
10. Do you think that certain types of drivers or types of vehicles pose greater safety risks on the Beltway than others? Which ones? Why?
11. (*If not mentioned in 9 or 10*) How important a safety hazard do you feel that so called "Aggressive Driving" is? What driving behaviors do you associate with aggressive driving? (*Probe Speeding, Tailgating, Frequent/Abrupt lane changing, and erratic maneuvers if not mentioned.*) Which of these behaviors do you feel are most threatening?
12. Are you aware of any differences between the Maryland and Virginia portions of the Beltway that you believe may cause confusion or create hazards? What? Why?
13. Before we move on, what other safety problems can you think of on the Beltway?
14. We are going to spend some time talking about what can be done to solve some of the highway safety problems you have identified. I'd like each of you to pick out two or three items from the list that you think are most important. (*Work around table. Tally next to items identified.*)

Suggested Solutions: [20 minutes]

Now, I'd like to get your ideas about what could be done to help solve the problems you have identified as being important. For the time being, I don't want you to worry about whether or not your ideas are practical. We are looking for creativity here, and I want everyone to feel that is safe to venture ideas that at first may seem "off the wall" If somebody ventures an idea that you disagree with or think is impractical, I don't want to hear you unless you have a way to build on the idea or improve it.

(Start with the problem most participants identified as being important and work through the list. Stay with an item only as long as ideas are flowing. Address as many items as time allows.)

Safety Team Issues: [30 minutes]

At the beginning of the session, I mentioned the Capital Beltway Safety Team. The Team is an outgrowth of the "Washington Area Safety Initiative", formulated by 120 representatives of federal state and local agencies concerned with highway safety, as well as representatives of private industry (including trucking associations), public interest groups and ordinary citizens. The Team's mission is to develop an integrated, regionally coordinated approach to improving safety on the Capital Beltway and they are charged with developing strategies to implement the "Safety Initiative's" 53 recommendations. Members of the Safety Team have asked us to get some specific feedback from Beltway users to help them accomplish their mission.

(Ask about as many areas as time permits, starting with the section on truck related issues. Rotate order of other topics to ensure that all are covered in an equal number of groups.)

Truck-related Issues:

1. How many of you have heard about a public information campaign called "NoZone?" What is your perception of the objectives of the program? How effective do you feel it has been?
2. How many of you have heard of an educational campaign called "Share the Road?" What do you think that means? How effective has it been?
3. What truck restrictions are you aware of that apply specifically to the Beltway?
4. Do you think it is reasonable and fair to place special restrictions on trucks driving the Beltway? Why/Why not? Of the existing truck restrictions, which ones do you object to? Why? Anybody disagree? *(Probe: left lane prohibition, speed limits, cargo restrictions if not mentioned.)*

5. When we talk with the general public about reducing congestion, somebody usually suggests banning trucks from the Beltway, especially during rush hours. What would your reaction be to banning trucks during rush hours? Why?
6. Another thing that comes up in focus groups with non-truck drivers is that vehicles such as garbage trucks, dump trucks, and school buses cause special safety problems on the Beltway because they have problems merging into and keeping up with the flow of traffic. Do you feel this is justified? Do you think of a ban on three axle vehicles on the Beltway would be a reasonable approach to solve the problem? Can you think of any alternative approaches?
7. Several of the Capital Beltway Safety Team's recommendations relate to increased commercial vehicle safety inspections. From your perspective, how often do you feel it is reasonable? How can increased inspection best be accomplished? *(Probe increased use of portable weigh/inspection stations, more pull-off areas on Beltway, increased inspections on feeder highways, in terminal/on-premises inspections, insurance discounts for 25/50K preventive maintenance inspections, targeting risky carriers.)*
8. What is your understanding of proposed changes in Federal Undercarriage Regulations? (devices that prevent cars from driving under tailgates) *(Ask tractor trailer drivers)* How often do you pull trailers that don't meet the new regulations? What would be your opinion about immediately banning all trailers that don't meet the new standard, rather than "grand fathering" existing trailers?
9. Within the past several years, roll-over warning devices have been placed on some of the ramps leading to and from the Beltway. Do you feel they are effective? Are there any locations that you feel should have these devices but still don't have them? What locations?

Enforcement Issues:

1. In general, how do you feel about law enforcement presence on the Beltway, How many of you feel that there is too little? How many feel that there is too much? How many feel it is about right?
2. Do you think a safety problem is created when a law enforcement vehicle is stopped along the Beltway? Do you feel that the safety benefits of law enforcement traffic stops on the Beltway justify any increased hazard they create? Does it seem to be better or worse if the law enforcement vehicles flashing lights are on?

3. How many of you would support increased funding for Beltway law enforcement? What would be the best way to pay for it? Which do you feel would be fairest, tolls, gas taxes, increased auto registration fees or increased fines?
4. What kinds of violations would you like law enforcement officers to make higher priorities, that is, what kinds of arrests would have the greatest impact on making the Beltway safer? Why? (*Ask other participants.*) What do you think?
5. What do you think the fines and points for traffic violations currently are? To what extent do you think they affect driver behavior on the road? Why? (*Ask other participants.*) Should penalties be higher on the Beltway than on other roads? (Count noses.) Why?
6. How many of you feel that the posted speed limit on the Beltway is too high? How many feel it is too low? How many feel it is about right?
7. How strictly do you feel that the posted speeds are being enforced? How much tolerance should officers allow before pulling speeders over?
8. How many of you feel that Maryland should enact a radar detector ban, similar to the bans in Virginia and DC? Why? Why not? If a radar detector ban is not passed in Maryland, how many of you would be in favor of using "drone radar" which generates false alarms on radar detectors? What do you think of federal regulations which prohibit detectors in trucks?
9. How would you feel about using video cameras (an automated system which takes pictures of cars that are speeding, tailgating and making abrupt lane changes on the Beltway) to issue tickets to the registered owners of the vehicles? Any other views? How many are for and against?
10. Do you feel that slow moving vehicles are as much of a hazard on the Beltway as those driving too fast? How many of you feel that Maryland should have a law similar to Virginia's which requires that slow vehicles, moving 10 MPH below the speed limit, must keep in the right hand lane?
11. What does the term "primary seat belt law" mean to you? Among Maryland, Virginia and the Capital District, what is your understanding of where not wearing a seat belt is a stopping violation? How many feel it should be a stopping violation everywhere?
12. Have you noticed any recent changes in the level of law enforcement activity on the Beltway? How long ago? Do you know the names of any such programs?

13. How many of you have heard about a law enforcement activity called "Smooth Operator". What do you think are the purposes of the program? What do you think the short term and long term effects of the program will be?

Incident and Traffic Management:

1. How many of you think it is illegal to move vehicles involved in accidents from the travel lane before law enforcement arrive? How many are aware that the law requires you to move them if practicable? Do you think is a good policy? Why?
2. Have you ever encountered a situation where there were pedestrians on the Beltway? Was it a safety problem? Where and When?
3. What is your reaction to making disabled or abandoned vehicles on shoulders subject to immediate towing? Why? How many of you favor changing laws and procedures to authorize this?
4. How many are aware of motorist assistance patrols on the Beltway? Has anyone in the group had a personal experience with them? *(If yes)* How long did it take them to respond? What would you do if help did not arrive in 15 minutes? What if it was a half hour or an hour?
5. How many of you have a car phone? Does anyone know what number to dial to report an non-emergency accident? (*77 in Virginia, #77 in Maryland)
6. Highway planners are working on longer term high tech solutions to managing traffic on the Beltway, involving traffic sensors, TV cameras, computers, data links, control centers, etc. The objective would be to manage the flow of traffic by doing such things as changing speed limits and use of lanes on the Beltway and major access and egress roads, as well as possibly controlling traffic signals. How much will this help? What problems, if any, do you think these kinds of systems might create for motorists? Parts of the system are already functioning. What changes have you noticed? Do you think it is helping?

Work Zone Safety:

1. *(If not previously discussed)* How important is construction and maintenance work on the Beltway as a cause of crashes? Why? What could be done to make construction and maintenance less of a problem?

2. How annoying are construction delays? How many minutes of construction delay does it take to change you attitude from mere annoyance to anger? Is your threshold of tolerance different at different times of the day?
3. What are your feelings about the present adequacy of warning signs, barriers, pavement marking, flagging, etc. at work zones? Do you usually know about major construction well in advance of coming to it? How do you find out about it? What improvements would you suggest?
4. What do you think of a proposal to require law enforcement presence at all major Beltway construction sites?
5. At present, how realistic are the speed advisories at work zones? How many of you slow down some? How many of you slow down to the posted speeds? Would your behavior be different if law enforcement were present? If posted speeds were higher, would you slow down less? How many know that speeding fines are higher in a work zone? Now that you know, will you still speed?

Operation and Design Enhancements:

1. Do you feel the Beltway is kept in good repair? What particular problems, if any have you noticed?
2. What differences do you notice in highway features (including signs and markings as well as the roadway and ramps) when you pass from Maryland to Virginia or vice versa? (*For each item mentioned*), Which do you feel is better and why?
3. Do you ever encounter problems seeing lane markings and other pavement markings on the Capital Beltway? Under what conditions? Do you feel this is more or less of a problem than it was a few years ago?
4. It has been suggested that congestion leads to accidents, and one way to help relieve congestion might be to narrow the existing lanes to create one more lane? What do you think of this idea? What would you think about converting the right shoulder, or breakdown lane into a travel lane?
5. How do you feel about high occupancy vehicle lanes? How many people should be required in a vehicle to be lawful in an HOV lane? Would you support construction of an HOV lane on the Beltway?
6. It has been suggested that a lot of Beltway congestion could be relieved by enhancing traffic management on arterial streets connecting with the Beltway, creating what highway

planners call "Super Arterials". This might involve limiting access to surface streets and changing signals on them to give priority to rush hour traffic entering or exiting the Beltway. What locations do you know of where this would be a major benefit? What kinds of disruption in local traffic would you envision?

7. Another suggestion to reduce congestion is tolls on rush hour traffic. What effects do you think this would have? How high a toll would it take to reduce or change the timing of your Beltway use? What do you think toll collection would do to the flow of traffic? How many of you are for and against this?
8. How many of you car pool, at least occasionally, to commute to and from work? How often do you do it? What are the advantages? What are your reasons for not car pooling?
9. How many of you use mass transit, at least occasionally to get to and from work? How often? What are the advantages? What are reasons for not using mass transit? What kind of service would need to be available to get you to switch from driving to using mass transit?
10. It has also been suggested that additional highways are the only or best way to substantially reduce Beltway congestion. How many of you favor building new major highways for that purpose? In what particular corridors or locations do you believe they would be most beneficial?

Education and Public Information:

1. How do you go about getting traffic information about the Beltway, that is, what are your sources of information? What sources are most helpful? What kinds of information would you like?
2. How satisfied are you with information from electronic signs on the roadway? Should there be more of them? Where? Do any of the signs themselves cause safety problems? (*get explanations.*) Which type is better, overhead signs or ground mounted signs? Why?
3. How many of you have ever called the VDOT or AAA traffic information numbers? How often? How helpful is the information?
4. In your travels, how many of you have been exposed to TARS (Traffic Advisory Radio System), where you can tune in a special station dedicated to highway condition messages on your car radio? How often do you tune in to those on the Beltway? How helpful is the information?

5. If you find out about traffic problems in advance, do you try to take alternative routes? Would it be helpful if alternatives were suggested to you? Should electronic signs be used for this purpose?
6. Other than in this room, what highway safety messages or slogans can you remember being exposed to in the past year or so? (*Unaided Recall.*)
7. How many of you remember hearing or seeing the following safety campaign slogans or themes: (*Aided Recall.*) "Drive to Survive"? "Buckle Up, it's the Law"? "Sharing the Road with Trucks"? Other messages remembered by participants?
8. What kinds of media do you feel would be most effective in reaching you with these kinds of messages? Do you feel it is appropriate to use variable message boards on the Beltway for these kinds of messages when not being used for urgent warnings?
9. How many of you feel that the Driver's License Tests in your state assure that drivers have the knowledge and capabilities needed to drive safely on the Beltway? What changes would you suggest? How many feel that drivers should be re-tested? Under what circumstances? To what extent do you feel that Beltway drivers are self-selecting, that is, drivers who are not capable of handling the Beltway tend to stay off it?
10. What, in your view, should driver training programs teach students about driving on the Beltway? How do you feel it should be taught? What should new drivers be taught about trucks? Do you think that knowledge about trucks should be included in licensing tests?
11. How many of you have a CDL? How many of you have studied for one? What is your opinion of the requirements? What requirements, if any, do you feel are unfair or unnecessary? What, if anything, should be added?

April 1998
NTS-31