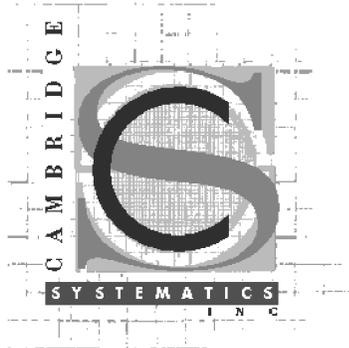

Appendix I

*Twin Cities Ramp Metering Effectiveness Study –
“Before” and “After” Qualitative Research with
Travelers*



Qualitative Research with Travelers

technical report

prepared for

Minnesota Department of Transportation

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December 2000

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Qualitative Research with Travelers

Overview

The following conclusions represent a synthesis of the results emanating from qualitative research conducted among freeway travelers within the Twin Cities region. These results should only be used for gaining an initial understanding of travelers' attitudes toward the recent ramp meter shutdowns due to the limited nature of the qualitative research.

The main purpose of this qualitative research was to gather information from freeway travelers both "before" and then several weeks "after" ramp meters were shutdown. Additionally, the research was conducted to address a number of specific issues for each to the two evaluation periods:

"Before" Shutdown Evaluation

- *What are travelers' general attitudes and perceptions toward the use of ramp meters; and,*
- *Which ramp meter performance measures and issues should be included in a more quantifiable and representative survey to capture travelers' perceptions?*

"After" Shutdown Evaluation

- *What are travelers' general attitudes and perceptions toward the ramp meter shutdown experiment; and,*
- *What changes, if any, would travelers like to see done to the way ramp meters are operated as a consequence of the shutdown?*

On September 12 ("before") and November 14, 2000 ("after"), two focus group sessions were held in Bloomington, MN for each of the two evaluation periods. These sessions were held among individuals who traveled on one or more of the following routes: I-94 east- or westbound in Minneapolis or St. Paul, I-494 between I-94 and I-394, and I-35E north- or southbound in St. Paul and areas north of the city. These routes constituted the experimental corridors for the ramp meter shutdown. In order to qualify for participation, individuals had to travel these routes during weekday hours from either 6AM - 9AM or 3PM - 6PM. Additionally, separate groups were conducted based on the frequency of travel as follows:

1. **Light Ramp Users** - make a total of 1-5 trips per week on average; and,
2. **Heavy Ramp Users** - make a total of 6 or more trips per week on average.

Also, an effort was made to insure that about a third of the participants in the Heavy Ramp Users group traveled these routes for commercial/work reasons. Further, each of the two groups (Heavy and Light Ramp Users) contained an equal mixture of participants who resided in either an urban or suburban area, and who used roadways that had a “convenient” or “non-convenient” alternate route as defined by travelers. Finally, there was an equal mixture of both male and female travelers between 18 and 65 years of age in each session. Despite efforts to recruit participants who traveled on the designated test routes from throughout the region, the location of the focus group facility in Bloomington introduced a slight bias toward participants with urban and inner suburban work locations and residences. These areas, relative to outer suburbs, were more likely to benefit from the ramp meter shutdown. This experience is reflected in the comments of the participants.

The findings discussed below reflect the combined results of both types of freeway travelers (Light and Heavy Ramp Users) unless otherwise noted.

Chapter 1: “With Meters”

Key Findings

General Ramp Meter Perceptions

For the most part, the mention of ramp metering in the Twin Cities region was initially met with considerable negative reaction. However, participants were quick to point out that a distinction should be made between their experiences waiting at ramp meters and traveling on the region’s freeway systems. Specifically, while many of the participants in both groups expressed the opinion that traveling on freeways has gotten worse over the years, it was never as bad as what they typically experienced waiting in line at ramp meters. This general feeling about traffic getting worse over the past 3 to 5 years was considered a result of population growth in suburban areas around the Twin Cities, while most of the jobs were still concentrated in urban areas. Thus, population sprawl in the suburbs contributed greatly to the increase in traffic congestion in the region’s freeway systems, as well as causing problems and back-ups at ramp meter entrances.

It was also interesting to note that whenever ramp meters were mentioned, albeit in a mostly negative tone, participants appeared resigned to the fact that metering has become a way of life for travel in the region. As such, they have become so accustomed to waiting in lines at meters that they did not even think about the impact that ramp meters may have on their quality of life. In an effort to rationalize their existence, a few participants went on to say that compared to other major cities or regions in the US, traffic on freeways flowed much better in the Twin Cities area as a result of ramp metering. This feeling was especially true for several participants in the Heavy Ramp User group compared to those in the Light Ramp User group. Also on the positive side, ramp metering was perceived as making travel more predictable in terms of the time it took to get to their destination once on a freeway. This was not true for the wait times and amount of back-up occurring on the ramps themselves which was considered to be the most unpredictable portion of any given trip.

As a consequence of their becoming accustomed to ramp metering, travelers were very adept in terms of planning which specific routes to take during peak morning and afternoon travel periods. Pre-trip planning information was often used in making a decision to use one roadway versus another, where travelers were quite knowledgeable about the region’s freeways and the use of local roads to get to their destinations. Advanced traveler information was readily available through commonly used sources such as the radio and in some cases the TV while at home in the morning. This information covered problems and major delays occurring in all major corridors as a result of normal rush hour congestion, accidents and bad weather driving conditions.

In addition to being very knowledgeable about specific roadways, participants were very familiar with the areas “best” and “worst” ramp meters during peak travel periods. A number of participants were so knowledgeable that they were able to cite the best and worse times of day to use a particular meter. This translated into a very common practice of knowing which alternative ramp meters to use based on time of day and destination.

In fact, a number of participants mentioned that they “shop around” for the best ramp meter to use if their primary meter entrance is backed-up for any length of time. This practice could be quite time consuming in and of itself, but participants were willing to spend time looking for an alternative meter just to avoid sitting around waiting in line. Thus, factors pertaining to the actual location of a ramp meter, and time of day used, had a specific impact on the decision to use one roadway or another.

Awareness of Ramp Meter Benefits

Overall, most participants in both groups were unable to remember when ramp meters were first installed and the rationale behind their installation. Except for one or two older participants in the Light Ramp User group, they had never known what it was like driving in the region without them. In fact, when asked when ramp meters were first installed, only one person was able to correctly identify the date to the mid-to-late 1960’s. However, participants were generally aware of the growth in ramp meter installations that typically followed construction of new freeways and other roadways connecting other points to the Twin Cities. But again, they could not remember when such growth actually occurred.

As such, there was a significant lack of justification for ramp metering since it occurred long ago and was not perceived as helping to increase the “quality of commuting life”. Further, since ramp metering was mostly viewed in the negative, specific benefits were not at the top of peoples’ minds. When participants in the two groups were able to cite specific benefits associated with ramp metering, the majority of comments given pertained to “reducing congestion” and “safety” issues. Specifically, it was mentioned that metering served to help traffic flow on the freeways, which in turn, allowed motorists to maintain adequate speeds and distances between vehicles. Also, meters decrease the potential for accidents since they provide a means to ease the merging of ramp traffic entering the freeway.

However, when specific benefits were provided on an aided basis (i.e., provided by the moderator), most participants agreed that the meters were indeed very beneficial to travelers. The benefits that resulted in the most positive reactions related to:

- Aids in merging traffic onto a freeway in a safe and orderly manner;
- Serves to increase speeds and the flow of traffic once on the freeway;
- Helps to conserve gas and expenses;
- Improves air quality and the environment; and,
- Reduces roadway stress and anxiety once on the freeway.

Interestingly enough, there was considerable debate over the merits of the last three benefits cited above. When it came to helping to conserve gas and thereby reduce air pollution, participants mentioned that travelers’ driving habits had as much an impact on actual consumption as ramp metering did on these same benefits. Also, road rage was mentioned as not being restricted to Los Angeles or other highly congested cities since it has found its way most recently to the Twin Cities. However, participants again made a clear distinction between the potential for reducing road rage on the freeways but not always on the ramps since wait times could be very frustrating for most travelers.

Finally, after discussing these specific benefits, many participants wondered why they were never told of them before. In fact, one participant stated that up to this point most of the group had only negative comments to say about metering and now, it appeared that metering had some positive benefits associated with it. As a result of this information, they felt a little better and perhaps less negative about ramp metering in general.

Ramp Meter Performance Measures

In the aggregate, none of the participants in either group mentioned having problems with the actual operation of ramp meters since they were perceived as being well-maintained and fully operational most of the time. The few problems that were mentioned pertained to a light being out for a brief period of time, which caused some confusion for travelers.

However, when it came to their experiences with wait times at certain ramp meters, participants thought the time spent waiting had no association with the amount of traffic on the freeway itself. For most part, there appeared to be no degree of consistency between the wait times experienced from one meter to the next, where several participants claimed that wait times were even inconsistent between adjacent ramps that were in proximity to one another. Also, it appeared to not even matter how heavy the traffic on the roadway was flowing since the wait time at one specific meter was always 30 seconds regardless of traffic. Furthermore, very few participants believed that there was “someone” who was responsible for controlling the wait time at a meter, and that it was simply turned off and on for set intervals much like a timer on a lamp in their homes. A few participants, however, mentioned that they thought they saw “cameras” in the proximity of ramp meters; but again, the idea of a “control center” was completely foreign to most of them.

When asked how they went about keeping track of waiting times at ramp meters, besides looking at their watch, travelers had some very interesting ways of measuring time. These included: counting cars ahead in line and noting the wait time interval, and the number of songs played on the radio, to name a few. For others, they simply waited in line for their turn to move with no need to keep track of the time. Additionally, in an attempt to ascertain the tolerance levels of travelers in terms of the amount of time they were willing to spend waiting in line before making a decision to use another ramp meter, participants were in agreement on this time interval. Overall, waiting times of 2-5 minutes were very acceptable to most participants. Whereas, wait times of 5-8 minutes were still tolerable and anything over 10 minutes was considered to be quite frustrating. Of course, the notion of waiting 10-20 minutes at some ramp meters was cause for seeking an alternate ramp to use if available on a particular route.

In addition to problems with wait times, back-ups on many of the more heavily traveled ramps meters was also cause for concern and was viewed as yet another source of frustration. Under such conditions, travelers had to be very clever in the strategies used to circumvent such problems. It was often difficult for travelers to get out of line or even attempt to take another route since there were very few alternatives available to them in most instances. As such, most travelers would like to have either longer ramps or some advanced notification of wait times before entering a ramp. This latter idea was very appealing to participants since it provided them with information that could be used to

make a decision about using a particular ramp meter just as long as an electronic message sign was located in a sufficient distance before the entrance. (It should be noted that the Mn/DOT Orion program experimented with just such signs and that this program was also evaluated by Cambridge Systematics. The study found wide receptivity to the signs. Unfortunately, technical problems in estimating average wait times have prevented advancement of this concept.)

Lastly, the use of by-pass lanes (or commonly referred to as “sane lanes”) as a means to avoid ramp meters altogether was not considered to be very useful by the majority of participants. This perception speaks to the fact that most commuters prefer the convenience of traveling alone for most of their trips, even though they are well aware of the many benefits associated with ridesharing. As such, participants often perceive the by-pass lanes to be underutilized for certain ramps, and would rather see them opened to all travelers instead of using them for their intended purpose.

Attitudes toward Ramp Meter Shutdowns

Even though several reports were written in the local media about the impending ramp meter experiment, only a few individuals in each group claimed to have heard anything about a temporary shutdown of the region’s ramp meters. Most of what was heard about this event came from articles in the newspaper or by word-of-mouth. However, there were several conflicting recollections about the exact nature of the event suggesting that the media was either somewhat vague in its reporting (which was not the case after reviewing a couple of these articles) or most likely, it just didn’t stick in the minds of most of them for a variety of reasons. These recollections ranged from shutting down ramp meters in specific corridors for a day or two to shutting down all meters for a few weeks. Among those participants who remembered hearing or reading something about the shutdown, the media’s description of it was felt to be more factual in content rather than opinioned and biased.

Participants were also asked what concerns, if any, they would have about such a shutdown of the region’s ramp meters. The most common reaction was that it would wreak havoc on travel in the region. The greatest cause for concern centered on those agencies or vehicles that needed to travel for emergency or safety purposes, such as ambulances and fire trucks. Surprisingly, however, most participants stated that except for leaving a little earlier in the morning, they would not change their travel routes or stay at home during the first few days of the experiment should it actually occur. They were convinced that to make an accurate judgement about the value of ramp meters, they should not do anything differently even if it meant taking on the extra burden of increased travel times for their normal commute during this period. Instead, most participants indicated that they would continue with their usual routines and wait to see what happens before making plans to use alternate routes. Also, when asked whether they would be more likely to rideshare or take public transportation, stated that they would be highly unlikely to do so. Perhaps not surprisingly, participants mentioned that public transit was not an option under this circumstance since it is not available to most travelers across the region.

Information Needs for Ramp Meter Shutdowns

In an effort to understand how information about the impending shutdown should be conveyed to the general public, participants were asked what they would like to know about it and the best way to inform them. For the most part, participants did not feel the need to have any specific types of information other than knowing when it would occur, what routes would be affected, and the duration of the experiment. This reaction to such a major event was rather surprising to say the least, but perhaps not out of character given their previous comments indicating that they wanted to treat this event as a real “experiment” where they should not do anything different. In fact, a couple of participants in each group suggested that they should be given as little information and advance notice as possible. However, once they began to realize the possible implications that this “experiment” could have on their own travel, participants generally agreed that they would like to be notified anywhere from 10 to 14 days in advance of the event in order to make adjustments to their schedules (e.g., don’t make any early morning meetings the first few days). Also, all media (newspaper, radio, and TV) should be used to convey information about the shutdown.

With regard to what information they would like to have available from Mn/DOT to be able to judge the impact of such a shutdown, participants were very clear about their needs. Interestingly, information pertaining to traditional traffic performance measures would be viewed as carrying more weight than either direct feedback from the general public or statements made by politicians and Mn/DOT officials. As such, they would like to have traffic performance data such as:

- Travel time between O-D pairs by time of day; and,
- Accident occurrences before and during the experiment.

Also, participants did feel the need to have input to the evaluation process where they would like to be surveyed and asked about their actual travel experiences during this experimental period. Participants were quite savvy about accepted research practices since a couple of them suggested that could be conducted by mail or over the telephone to be as representative as possible. Similarly, they recommended that the survey be conducted by a third-party source that had no stake in the outcome. This way, they would be assured that the evaluation would be completely unbiased and at the same time carry more credibility compared to what they might receive from a survey conducted by Mn/DOT or another government agency.

Implications

Based on the summary of findings from this initial qualitative exploratory research among travelers in the Twin Cities region, there are several overall implications that can be deduced from the “before” group sessions. These implications, however, do not focus on what needs to be asked during the “after” focus group sessions that will be conducted. Rather, they address the need to improve existing ramp meters should the decision be made to continue their operation in the region. Specifically, these include:

- Develop programs (media and outreach) that can be used to educate the general public on the benefits and rationale of ramp metering;
- Post average waiting times on an electronic display located well before the entrance to a ramp to allow travelers to make decisions about using alternate routes; and,
- Provide a degree of consistency between waiting times for adjacent ramp meters where wait times are adjusted for the amount of actual congestion on a roadway.

Chapter 2: “Without Meters”

Key Findings

General Reactions toward Ramp Meter Shutdowns

Based on the negative attitudes of travelers towards ramp meters when they were fully operational, it was not surprising that reactions were quite positive about the recent shutdown experiment. Overall, participants’ experiences traveling on freeways in the Twin Cities region were favorable since most felt that their commutes were now faster end-to-end compared to when meters were operational. Also, very few travelers noticed the occurrence of substantially more accidents as a result of the shutdown, meaning that travel on the region’s freeways did not appear to be any less safe than before. Further, once on the freeways, they did not experience any more back-ups than was typically the case before the shutdown. For the most part, the same bottlenecks existed as before with perhaps a little more wait time to go through them, but no new ones were created. Meanwhile, a few participants in the Light User group mentioned that they had experienced more congestion on certain sections of the freeway compared to travel on the same freeways when the ramp meters were operational. Overall, this situation was very surprising to some of the travelers who believed that there would be severe problems traveling in the region after the shutdown occurred.

In terms of their experiences on the ramps themselves, travelers’ levels of frustration had completely vanished. Wait times at even moderately congested ramps disappeared and became a non-issue. Several travelers went on to mention that instead of using alternate routes and back roads just to avoid the meters, they were now more likely to use a direct route which meant using a once congested ramp to get onto the freeway. Thus, short trips, which were previously diverted away from freeways by ramp meters, were now re-attracted to the freeways. When asked whether they would feel better about having to wait at a congested ramp meter to get on a freeway, or not having to wait at a meter but experiencing more congestion on the freeway, most of them chose the latter condition. Similar to what was heard in the “before” groups, travelers would rather be moving, albeit even at slower speeds, than enduring long waits at meters. Also, some travelers appeared not to mind the perceived increase in congestion since being in “control” and having the “freedom” to make decisions about which routes to use made the situation tolerable. Thus, travel on the freeways was viewed as being even more predictable since they did not have to anticipate the length of the wait at meters. This belief was perhaps based on perceptions of the immense variability in wait times that occurred at some meters when they were operational. Further, since they now believed that travel times to their destinations were slightly faster, this perception along with not having to wait at meters made them think that travel times had become more predictable.

As an interesting aside to this discussion, heavy travelers were first to mention that an unsuspected phenomenon was taking place concerning travel behavior in the region. Specifically, there was now a need for travelers to relearn how to merge into ongoing freeway traffic. Some travelers were still coming to a complete stop at the end of the ramp instead of trying to cautiously merge into traffic by adjusting their speeds and distances.

According to many participants in both groups, travelers had become so used to stopping at the end of the ramp that this habit was difficult to break, especially for older motorists in the region. In fact, radio and news broadcasters were constantly telling their audiences to “merge”, merge, merge” whenever possible since this would be the best way to get onto a freeway now that the meters were closed. As such, travelers would need to learn a whole new set of freeway travel behaviors if the decision was made to permanently shut down the ramp meters at the conclusion of the experiment. For these frequent travelers, they perceived that many drivers in the region were not inherently too timid about merging onto freeways.

Impact of Ramp Meter Shutdowns on Travel Behaviors

Consistent with travelers’ statements about what they would do during the first few days of the shutdown experiment, very few of them mentioned that they had actually modified their travel behaviors or routes taken to get to a particular destination. Except for a few travelers who were now more willing to use the freeways instead of taking alternate routes, they continued to use the same ramp entrances and routes as before. This was the case during the first few days of the experiment and continued up to the point when the group sessions were conducted. Interestingly enough, however, these consistencies in travel behaviors were not so much a result of a conscious decision to try to give the experiment a fair evaluation, rather, old habits were mentioned as being hard to break. In other words, unlike the altruistic sentiments expressed in the “before” groups, travelers did not feel a need to do anything different unless absolutely needed, which did not end up being the case as a result of the shutdown.

Again, similar to what was heard in the earlier portions of the discussions, travelers were quite pleased about the fact that there was essentially no more congestion on the freeways than they had experienced before the shutdowns. Also, no new bottlenecks were created aside from the ones that existed before the experiment, which everyone in both traveler groups already knew about. Therefore, it appeared that their tolerance levels for such congestion even at bottlenecks had risen dramatically since the single most common source of their frustrations (ramp meters) had been removed. Now, travelers wanted to see Mn/DOT spend public funds on improving the freeway system in the Twin Cities region rather than on maintaining ramp meters which they believed was just a “band aide” to a more pervasive and growing infrastructure capacity problem.

Finally, it should also be noted that since wait times and congestion on most ramp meters had actually disappeared, there was no need to discuss whether back-ups into intersections were still a problem after the shutdowns. And as such, it became a non-issue for the rest of the topic areas addressed in both traveler groups. However, even though wait times and back-ups were substantially reduced or non-existent, there was still a feeling that it would be necessary for some specific ramp meters to remain operational. This sentiment was based on the awareness that certain areas of the freeway system are still heavily congested and in need of metering to help alleviate such congestion. Therefore, in these cases metering made a lot of sense.

Media Coverage of Ramp Meter Shutdowns

As previously discussed, travelers' prior expectations for what would happen after ramp meters were shutdown, did not materialize after it actually occurred. Prior to the shutdown, the expectation was that travel in the area would be difficult during the initial period of the experiment and then taper off gradually to where it would become tolerable again. Instead, the exact opposite occurred where even on Day 2 of the experiment travel in the region appeared to improve. Perhaps participants' reactions in the "before" groups were mainly a fear of the unknown since metering has been a way of life in the Twin Cities for a long time. Also, the media's portrayal of what would happen leading up to the experiment was more alarmist-based rather than reality-based. In spite of this, most travelers adopted a "wait and see" attitude before deciding to make substantial changes in their travel behaviors.

Consistent with this observation, travelers were very vocal about the way various media sources depicted the shutdown experiment both before and during its occurrence. In their view, the media made a big deal over nothing and tended to exaggerate the situation making it more newsworthy than what it should have been. There were accounts of accidents occurring all over the roadways and incidents taking place on ramps that most travelers did not experience. Therefore, travelers tended to discount these stories and placed more importance on what they saw rather than what they heard.

In terms of the specific information disseminated by Mn/DOT and the media to inform travelers about the shutdown experiment prior to it happening, all travelers mentioned that they were given sufficient information and in a timely manner. When asked about the lead-time given for when the shutdown actually would occur, travelers indicated that they knew about it anywhere from 3-4 weeks in advance. Also, they recollected receiving information about the actual shutdown date about one week in advance which was more than ample time for them to make alternate plans if warranted. Thus, it appeared that Mn/DOT did a more than acceptable job of informing the public about the experiment since participants in both groups mentioned that they did not require anything else about the shutdown other than what they had been told. Also, the various dissemination sources (TV, radio and newspapers) used were more than adequate in making sure the general public knew of the specific details of the shutdown.

Evaluation of Ramp Meter Shutdown Experiment

Similar to what was heard in the "before" group sessions, participants in the "after" groups were very clear about the types of information they would like to have available from Mn/DOT to be able to judge the impact of the shutdown experiment. Again, information pertaining to traditional traffic performance measures would be viewed as carrying more weight than either direct feedback from the general public or statements made by politicians and Mn/DOT officials. As such, they would like to have traffic performance data such as:

- Travel time between O-D pairs by time of day; and,
- Accident occurrences before and during the experiment.

However, unlike the previous sessions, they had very mixed feeling about what sources should be used to make these evaluations and who should be responsible for sharing the outcome. In the “before” sessions, it was felt that a third-party source would more unbiased and carry more credibility with the general public than would be the case if the evaluation was done solely by Mn/DOT. Whereas, in the “after” groups, this belief was not as clear-cut. This may have been in part due to several participants in the Light Ramp User group mentioning that they had read something about MN/DOT spending a large sum of money to have an external consult (sic, Cambridge Systematics) perform the evaluation. As such, these participants thought that the funds could be better spend improving the freeway system in the region. However, many others were not as skeptical as these participants and realized that an unbiased source should perform the evaluation.

Also, when it came to informing the public about the outcome of the shutdown experiment, participants in the “before groups” were unanimous in their feelings that the information should come directly from Mn/DOT officials. Specifically, they mentioned that the best way to inform the public about the outcome and the future status of the experiment would be through a series of short announcements conducted with the media (primarily TV and newspapers). They wanted to be able to hear the criteria that MN/DOT would be using to make their decisions about the status of metering so that they could form their own opinions about the reliability and credibility of such performance measures.

Preferences for Alternative Ramp Meter Solutions

Prior to asking travelers what they would like to see done to improve ramp metering in the Twin Cities region, a vote was taken where they had to choose between three different outcomes based on their experiences with the recent shutdowns. The options included:

- A) Re-open the ramp meters the way they were before;
- B) Keep the ramp meters permanently closed; or,
- C) Keep ramp meters but change the way they operate.

Interestingly, no one in either of the two groups chose Option A, which meant re-opening the meters the way they were before. However, travelers were equally split between Options B and C based on the general feeling that although they would like to have a source of frustration disappear, they believed that ramp metering does help to alleviate traffic congestion for certain areas of the region’s freeway system. Also, travelers were asked whether Mn/DOT should turn the meters back on while deciding to proceed in one direction or another, or whether they would like to have the experiment continue for an indefinite period where new ways of operating meters could be tried. Perhaps not unexpectedly, travelers were again unanimous in their feeling that they would not like to see the meters re-opened as before and that it is important for Mn/DOT to try as many solutions as possible to improve traffic flow on the freeways.

In keeping with this attitude, travelers were given a series of potential ramp meter solutions to evaluate, which included:

- *Keeping some meters open and others closed based on the degree of congestion;*
- *Adjusting wait times at meters so that queues are shorter;*
- *Installing “smart” meters that adjust wait times to actual traffic congestion and queue lengths;*
- *Providing signage/displays at ramp meter entrances that post average wait times; and,*
- *Shortening the hours of ramp metering during peak morning/afternoon travel.*

Across both groups, travelers were very much in favor of either keeping some meters open and closing others, or, installing “smart” meters to adjust waiting times to reflect a variety of traffic conditions. These two solutions were cited most often, followed by two others that included displaying wait times at ramp meter entrances and shortening the hours of ramp meter operations (especially turning them off earlier at night rather than turning them off later in the morning). Again, these solutions were in keeping with many of the opinions discussed during the sessions and provided acceptable courses of actions for Mn/DOT to take if the decision is made to continue the experiment.

Implications

Based on the summary of findings from this qualitative exploratory research among travelers in the Twin Cities region, there are several overall implications that can be deduced from the “after” group sessions. These implications center on the publics’ wish to have Mn/DOT continue to evaluate acceptable ramp metering solutions rather than merely turning them back on or keeping them permanently off. Specifically, these recommendations reflect the need to make changes in both travelers’ driving behaviors and habits and the actual operations of the ramp meters themselves as follows:

- Develop driver education programs that can be used to “train” travelers about appropriate ramp merging behaviors and freeway etiquette;
- Monitor ramp meters one at a time to evaluate whether it should be opened or permanently closed based on traffic conditions and the alleviation of congestion; and,
- Install “smart” meters on those ramps that have been found to require metering so that wait times reflect actual traffic conditions on the ramp at the time.

Appendix A: “Before” & “After” Topic Guides

MINNESOTA DEPARTMENT OF TRANSPORTATION
RAMP METER STUDY - QUALITATIVE RESEARCH
"BEFORE" GROUP SESSION TOPIC GUIDE

I. INTRODUCTION (10 Minutes)

1. Moderator Introduction: State name, title and company.
 - Explain what discussion groups are all about.
 - Inform Participants: A study is being conducted in the Twin Cities area among people like yourselves who travel freeway routes with ramp meters. The information you provide tonight will be used by the Minnesota Department of Transportation and other government agencies to gain a better understanding of travelers' attitudes towards the installation of ramp meters in the region's freeway system.
2. Specific Purpose of Discussion: To learn what you think about ramp meters in general, the types of benefits ramp meters may or may not provide, and how the existence of ramp meters effect your decision to use specific routes, modes of transportation, and times of travel.
3. Explain To Participants:
 - Ground rules (no right or wrong answers and informal open discussion)
 - Observers (one-way mirror)
 - Audio and video taping
 - Two-way confidentiality
4. Participant's Introduction: State name, occupation, residence/community (urban or suburban location), and describe a typical trip on and the freeway during peak travel periods in terms of:
 - sections of freeway routes traveled on (I-94/-394/-494/-694/-35E/-35W/TH 77);
 - amount of time (percentage of travel) spent on such routes during peak weekday periods (6-9 AM and 3-6 PM); and,
 - primary reasons for traveling on these routes.
5. Stress to Participants: We are not here to talk about future expansions of the freeway system, or any roadway construction problems that you encounter.

II GENERAL PERCEPTIONS OF RAMP METERS (25 Minutes)

1. With this said, overall, what can you say about traveling on roadways with ramp meters in the Twin Cities region (I-94/-394/-494/-694/-35E/-35W/TH 77)? (*Probe for: general impressions and experiences*)
 - Has traveling on these roadways gotten better or worse over the last few years? (*Probe for: reasons why or why not and specific examples*)
 - What do you think is primarily responsible for making this experience better/worse? (*Probe for: specific conditions and demographic changes*)
 - Have you become accustomed to ramp meters as a way of traveling in the region, and how so?

2. Also, I'd like to know your feelings about the installation and operations of ramp meters in the region's roadways? (*Probe for: positive or negative reactions*)
 - To the best of your knowledge, what were some of the reasons for installing ramp meters in the first place – and, were these good reasons for doing so?
 - Do you think they make travel more predictable and reliable? (*Probe for: reasons why or why not*)

3. Based on your own experiences, what are some of the primary benefits to travelers in having ramp meters installed on certain roadways? And, what are some of their primary drawbacks? (*Probe for: general benefits obtained*)

4. In addition to these benefits and drawbacks, do you think ramp meters have an effect on ... ?
 - Travel times and speeds
 - Safety and accident reduction
 - Gas consumption & expenses
 - Air quality & environment
 - Roadway stress and anxiety
 - Person- and vehicle-trips made/mileage

For safety and accident reduction mentions, probe for: ramp itself, ramp traffic merging onto freeways, and freeway traffic itself.

5. What do you think about when making plans to travel on roadways that have ramp meters? (*Probe for: pre-trip planning decisions*)
 - Is the presence of ramp meters a factor in your decision to use one roadway versus another, one time of day versus another, or another mode if both could get you to the same destination?
 - Does it make a difference whether your travel is for commuting or work-related reasons versus pleasure reasons in terms of your choice of roadway types to use (*Probe for: freeway vs. arterial*)?

6. Is information available to you from any source about existing ramp meter back-ups or problems prior to your departure? And, is this information provided well in advance to allow you to make a decision about using a specific roadway? (*Probe for:* impact on departure and arrival times)

III. Evaluation of Ramp Meter Performance - MOE's (25 Minutes)

1. Now, I'd like to focus our discussion on the overall operations of ramp meters in particular?
 - Have any of you encountered problems or incidents with ramp meters operating properly, and what were they?
 - Do you think they are adequately maintained most of the time?
 - What happens to traffic on the ramp and the next few miles of freeways/roadway when a meter has broken down or doesn't function properly?
 - Are these problems serious enough to make you want to try an alternate route? (*Probe for:* reasons why or why not)
2. Next, I'd like to know about your experiences with actual ramp meter wait times on routes such as (I-94/-394/-494/-694/-35E/-35W/TH 77)?
 - In general, what can you say about the average wait times on these ramps?
 - Are most of the ramps properly metered in terms of the amount of time you are required to wait?
 - Do you ever think about how long you have been waiting - do you keep track of the time and how do you measure it if you do?
3. Also, thinking about getting onto a specific ramp meter entrance, are most of the ramps long enough to accommodate all of the vehicles waiting in line? (*Probe for:* general experiences and adequacy of ramp itself)
 - Does traffic ever back up onto streets and intersections - and, how frequently does this occur in your estimation?
 - What do you do when ramps are backed up - do you get out of line or avoid it entirely and take an alternate route or another ramp?
 - How convenient is it for you to avoid back-ups and take an alternate route or another ramp?
 - Do you wish there could be some sort of notification at the ramp when problems occur - and, what would you like to know?

4. Are “by-pass lanes” (HOV’s) an adequate solution to ramp meter back-up?
(Probe for: reasons why or why not)
 - Do you think there are enough of them, and are they located where they are needed most?
 - Do you think they are used appropriately and serve a purpose?
5. In your opinion, what would you like to see done to improve waiting times and lines on some of the busiest ramp meters? (Probe for: specific recommendations and why it would improve time/lines)
6. And, is there anything that you would like to see done to improve ramp meters in general? Give me three things that you would like to see done.

IV. Expectations for Ramp Meter Shutdowns (20 Minutes)

1. Up this point, we have been talking a great deal about your experiences with ramp meters and travel in the Twin Cities region, so I’m wondering whether any of you have heard about possible ramp meter shutdowns by MnDOT.
 - First, how many of you have ever heard or read anything about this shutdown? (Probe for: show of hands)
 - And, where did you hear or read about this shutdown?
2. In your opinion, has the information been generally positive or negative?
(Probe for: general media reactions)
 - Has this information been presented in a fair and unbiased manner?
 - Have you been given sufficient information by MnDOT and the media to let you know what to expect once the shutdown happens?
3. What do think about shutting down the ramp meters on a temporary basis as an experiment to see would happen to freeway travel in the Twin Cities Region? (Probe for: overall public reactions to such news)
4. Overall, what concerns or problems do you foresee with shutting down ramp meters? And, how do you think most travelers will react? (Probe for: specific expectations)
5. How do you think such a shutdown will affect your own travel habits on such routes as (I-94/-394/-494/-694/-35E/-35W/TH 77)?

- Would any of you avoid leaving home to go to work or another destination when the ramp meters are shutdown?
- Would you make fewer trips during the period that the meters are shut down? How convenient would that be for you?
- Would you plan on taking alternate routes, and how convenient would these routes be in such a situation?
- Would you plan on leaving earlier or later, and how convenient would that be for you?
- Would you consider car pooling during this period and do you think this strategy would be effective?
- And, how many of you would consider taking public transportation to your destination?
- What other travel strategies would you consider, if any?

V. Information Needs for Ramp Meter Shutdowns (10 Minutes)

1. If an announcement were made that all ramp meters were being temporarily shut down a week from today, what would you want to know about the shutdown? (*Probe for: specific information needed*)
 - How far in advance would you want to know about the shutdowns to allow you to make appropriate travel decisions? (*Probe for: 2 days, 4 days, a week, or more*)
 - Would you like to know about possible alternate routes to take or other travel options, if available in your area?
 - From what sources would you like to be able to obtain this type of information? (*Probe for: specific sources/media and why useful*)
 - And, what else would you like to know about it?
2. Assuming that the ramp meters are going to be shut down for a limited period of time, what information would you like to have from MnDOT to be able to judge the impact of such a shutdown for yourself?

If not mentioned, probe for:

- | | |
|----------------------------------|--------------------------------------|
| -- Travel times and speeds | -- Air quality & environment |
| -- Safety and accident reduction | -- Person- and vehicle-trips made |
| -- Gas consumption & expenses | -- Person- and vehicle-trips mileage |

For safety and accident reduction mentions, probe for: ramp itself, ramp traffic merging onto freeways, and freeway traffic itself.

3. Do you think you would be in a position to judge the impact of such a shutdown based on your own travel experiences during this period? And, why so?
4. Finally, what would be the best way to inform the general public about the outcome of a temporary ramp meter shutdown prior to MnDOT making any permanent decisions about it? (*Probe for: specific sources/media and why useful*)

VI. CONCLUSION (5 MINUTES)

1. Ask participants: is there anything else that you would like to discuss before we conclude?
2. Thank participants for their valuable input and attendance at the session.

MINNESOTA DEPARTMENT OF TRANSPORTATION
RAMP METER STUDY - QUALITATIVE RESEARCH
“AFTER” GROUP SESSION TOPIC GUIDE

I. INTRODUCTION (10 Minutes)

1. Moderator Introduction: State name, title and company.
 - Explain what discussion groups are all about.
 - Inform Participants: A study is being conducted in the Twin Cities area among people like yourselves who travel freeway routes with ramp meters. The information you provide tonight will be used by the Minnesota Department of Transportation and other government agencies to help decide whether ramp meters should be kept closed, reopened or somehow modified going forward in the future.
2. Specific Purpose of Discussion: To gauge your overall reactions toward the recent closing of ramp meters, the specific advantages or disadvantages that are gained by keeping ramp meters either opened or closed, how the closure of ramp meters has effected your decision to use specific routes and different modes of travel, and finally, what impacts have ramp meter closures had on both travel times and your “quality of life”.
3. Explain To Participants:
 - Ground rules (no right or wrong answers and informal open discussion)
 - Observers (one-way mirror)
 - Audio and video taping
 - Two-way confidentiality
4. Participant’s Introduction: State name, occupation, residence/community (urban or suburban location), and describe a typical trip on the freeway during peak travel periods both before and after the shutdown in terms of:
 - sections of freeway routes traveled on (I-94/-394/-494/-694/-35E/-35W/TH 77 - “before” and “after”);
 - use of specific ramp meter entrances (“before” and “after”)
 - changes in percentage of travel time spent on such routes during peak weekday periods from “before” to “after”(6-9 AM and 3-6 PM); and,
 - primary reasons for traveling on these routes.

II GENERAL PERCEPTIONS OF RAMP METER CLOSURES (20 Minutes)

1. To begin, what can you say about traveling on roadways in the Twin Cities region now that ramp meters have been shutdown (I-94/-394/-494/-694/-35E/-35W/TH 77)? (*Probe for: general impressions and experiences*)
 - Has the shutdown been a favorable or unfavorable experience overall? (*Probe for: reasons why for each experience*)
 - Has traveling on roadways gotten better or worse compared to when they were open? (*Probe for: reasons why or why not and specific examples*)
 - What do you think is primarily responsible for making this experience better/worse? (*Probe for: specific conditions*)

2. Do you think the recent closure of ramp meters has made travel on these roadways more predictable or less predictable than before? (*Probe for: reasons why or why not*)
 - Thinking only about the time you now spend entering a ramp and merging into traffic, is your travel time more or less predictable than before? (*Probe for: reasons why or why not*)
 - And, how about once you are on the roadway itself, is your travel time more or less predictable than before? (*Probe for: reasons why or why not*)

3. Based on your own experiences, what are some of the primary benefits to travelers in having ramp meters closed? And, what are some of their primary drawbacks? (*Probe for: general benefits and drawbacks*)

4. In addition to these benefits and drawbacks, how do you think ramp meter shutdowns have affected ... ?

-- Travel times and speeds	-- Air quality & environment
-- Safety and accident reduction	-- Roadway stress and anxiety
-- Gas consumption & expenses	-- Person- and vehicle-trips made/mileage

For safety and accident rates or occurrences mentions, probe for: ramp itself, ramp traffic merging onto freeways, and freeway traffic itself.

III. Impact of Ramp Meter Closures on Travel Behaviors (30 Minutes)

1. Now, I'd like to focus our discussion on how the recent shutdown of ramp meters in the Twin Cities region has affected the way you now travel to your particular destinations. Thinking only about the first day or two of this event, how many of you ...?
 - Stayed at home or worked from your home rather than go to your normal destination? (*Probe for: take show of hands*)
 - Made plans to do something different, like leaving earlier or later in the day? (*Probe for: take show of hands*)
 - Tried a different route, maybe one that you would liked to have taken before the shutdown or one than you now thought would be faster or easier? (*Probe for: take show of hands*)
 - Decided to rideshare or car pool without someone else? (*Probe for: take show of hands*)
 - Took a bus/express bus or some form of public/private transit? (*Probe for: take show of hands*)
2. For those of you who did nothing different, why didn't you change your plans? (*Probe for: general reasons for their inertia*)
3. Did any of you feel that by doing something different, you would not be giving the "experiment" a fair chance to be evaluated? (*Probe for: how many felt this way and reasons why*)
4. Next, is traffic on the freeways you use more or less congested than it was before the shutdown? (*Probe for: general impressions*)
 - Are there bottlenecks along certain routes that were not there before, and where along these routes does this now occur?
 - Where do you see the most problems occurring, if any, now that the ramps have been closed?
5. Also, I'd like to know about your experiences with actually getting onto ramps at routes such as (I-94/-394/-494/-694/-35E/-35W/TH 77) at this time?
 - In general, what can you say now about entering a ramp and merging onto traffic – is it much easier, more difficult or about the same?
 - Is traffic at certain ramps still backed up onto streets and intersections – and, how frequently does this now occur of at all?

6. Thinking about the use of alternate routes to get to your particular destination, I'd like to know whether your decision to use such routes has been affected as a result of the ramp meter shutdown? (*Probe for: general impressions*)
 - Are you now more likely or less likely to use to use such routes compared to before the meters were shutdown?
 - How convenient is it for you to use an alternative route now, and are you using certain routes that you would never used before the shutdown?
 - If you used a particular alternate route prior to the shutdown, how would you compare your experiences on such routes after the shutdown?

IV. Expectations and Media Coverage of Ramp Meter Shutdowns (20 Minutes)

1. Up this point, we have been talking a great deal about your experiences with ramp meter shutdowns and their impact on travel in the Twin Cities region.
 - First, prior to the shutdown, did your expectations for what would happen to travel in the region come true in terms of what actually occurred? (*Probe for: degree of consistency between expectations and reality*)
 - And, were any of you surprised by what actually occurred – and if so, how and why were you surprised?
2. In terms of the information you were provided prior to the shutdown, how much of an advanced notice were you given by Mn/DOT and the media about the shutdown “experiment”? (*Probe for: perceptions of time*)
 - Was the time from when you were first officially notified about the shutdown to when it actually took place acceptable to you? (*Probe for: why or why not, and how long of a time should a notice have been given*)
 - Were you given sufficient details about the shutdown to allow you to make alternative travel plans, if desired?
 - What other information about the shutdown would you have liked to know now that you have actually experienced it? (*Probe for: specific types of information needed*)
 - What other media sources, if any, should have been used to provide such information to you? (*Probe for: adequacy of availability and access to media sources*)
3. Has the media coverage of the shutdown “experiment” affected your opinion about ramp meters in general, and if yes, how so? (*Probe for: general feelings*)

4. In your opinion, has the media's depiction of the shutdown "experiment" been generally positive or negative? (*Probe for: general media reactions*)
 - What has been the general consensus of the media overall?
 - Has their reporting of the shutdowns been presented in a fair and unbiased manner?
5. And, have your own attitudes toward the installation of ramp meters in the Twin Cities region changes as a result of the "experiment" and how so if yes? (*Probe for: general reactions*)
 - Do you think most people's opinions have changed as a result of the "experiment", and are they more positive, negative or neutral than before?
 - Do you think you have been given adequate time to be able to evaluate the outcome of this "experiment"?
6. Also, what information would you like to have from Mn/DOT to be able to judge the impact of such a shutdown for yourself?

If not mentioned, probe for:

- | | |
|----------------------------------|--------------------------------------|
| -- Travel times and speeds | -- Air quality & environment |
| -- Safety and accident reduction | -- Person- and vehicle-trips made |
| -- Gas consumption & expenses | -- Person- and vehicle-trips mileage |

For safety and accident rates or occurrences mentions, probe for: ramp itself, ramp traffic merging onto freeways, and freeway traffic itself.

7. Finally, what would be the best way to inform the general public about the outcome of the temporary ramp meter shutdown prior to Mn/DOT making any permanent decisions about it? (*Probe for: specific sources/media and why useful*)

V. Travelers Preferences for Alternative Ramp Meter Solutions (15 Minutes)

1. Thinking about all of the issues we have talked about tonight, and your own experiences with the shutdown of ramp meters, it is now time to take a vote. This time, you have three choices and they are (take show of hands for each):
 - A.) Re-open the ramp meters the way they were before;
 - B.) Keep the ramp meters permanently closed; or,
 - C.) Keep ramp meters but change the way it is done (operate).

2. For those of you who would like to do something different, what would you like to see Mn/DOT do with them. Please give me three things that you would like to see done?

If not mentioned probe for:

- Keep some meters open and close others based on the degree of congestion.
 - Adjust waiting times on the meters so that you don't have to wait more than some specific length of time, say 5 or 10 minutes.
 - Install "smart" meters that adjust waiting times to reflect actual freeway congestion and the length of the queue on the ramp.
 - Provide signage/LCD displays at certain meters to let travelers know what the average waiting time will be.
 - Other recommendations.
3. And finally, if you had the chance to say something to Mn/DOT about this entire ramp meter shutdown "experiment", what would you now like to say to them?

VI. CONCLUSION (5 MINUTES)

1. Ask participants: is there anything else that you would like to discuss before we conclude?
2. Thank participants for their valuable input and attendance at the session.

Appendix B: Recruitment Screener

MINNESOTA DEPARTMENT OF TRANSPORTATION
- RAMP METER STUDY -
FOCUS GROUP SCREENER

Interview Date ____ / ____ /00

Interviewer Name: _____

Agree to Invitation: ()

Respondent Name: _____

Not Agree to Invitation: ()

Address: _____

Term: () at Q. _____

City, State, Zip: _____

Respondent Phone # () _____

Status

Heavy Ramp Users -1 ()

Light Ramp Users -2

Market

Twin Cities, MN -1 ()

Group Assignment

Minneapolis, MN – 9/12/00 (Tuesday)

Group 1: Heavy Ramp Users - 6:00 p.m.

Group 2: Light Ramp Users - 8:00 p.m.

INTRODUCTION

Hello, my name is _____. I'm calling for Cambridge Systematics, an independent consulting and marketing research company. We're conducting a study about travel habits in the Twin Cities region on behalf of the Minnesota Department of Transportation and would like to ask you a few questions.

Interviewer: Make sure that an even mixture of travelers with different ages and sexes are recruited for each group. If necessary, alternate between asking for either a female or male over 18 years of age during the initial HH introduction below.

Household Introduction

May I speak to someone in this household over 18 years of age that travels outside the home and uses one or more of the following routes: : **(a) I-94 East or West bound in Minneapolis or St. Paul, (b) I-494 between I-94 and I-394, and (c) 35E North or South bound in St. Paul and areas north of the city** during weekday hours between 6 – 9 AM or 3 – 6 PM.

Business Introduction

May I speak to someone at this location that regularly uses one or more of the following routes: **(a) I-94 East or West bound in Minneapolis or St. Paul, (b) I-494 between I-94 and I-394, and (c) 35E North or South bound in St. Paul and areas north of the city** during weekday hours between 6 – 9 AM or 3 – 6 PM for commercial driving purposes such as hauling freight, making deliveries or transporting passengers.

- Q1 Would this person be you or someone else (in your household/at this location)?
- (Continue)** ----- Person -1 ()
- (Ask to speak to person or arrange callback)** ----- Someone Else -2
- (Discontinue, and record as "none HH")** ---- No Person in HH/Business Location -3

- Q2 And, which of these specific routes do you regularly use? **(Read list if necessary. Record all that apply below.)**
- I-94 East or West bound in Minneapolis or St. Paul -1 ()
- I-494 between I-94 and I-394 -2
- 35E North or South in St. Paul and areas north of the city -3
- (Discontinue, and record as "no routes")** ----- Don't Know/Not Sure -4
- (Discontinue, and record as "no routes")** ---- Don't Use Any of These Routes -5

- Q3 Do you mostly travel this/these route(s) ... ? **(Read list. Record one response)**
- Weekdays from 6:00 AM to 9:00 AM -1 ()
- Weekdays from 3:00 PM to 6:00 PM -2
- (Discontinue, and record as "wrong hours")** ----- Weekdays after 6:00 PM -3
- (Discontinue, and record as "wrong hours")** --- Or, weekends and holidays -4
- (Do not read. Discontinue, and record as "wrong hours")** ----- Don't know/Not sure -5

Q4 In an **average week**, about how many times do you use this/these route(s) **during weekday hours** for any travel reasons? Please assume that if you travel round trip, each leg counts as a single trip in your estimate. **(Record number of trips below.)**

Number of Trips per Week: _____ ()

If the total trips is "6 or more", then qualifies for Group 1 – Heavy Ramp Users (check quotas).
If the total trips is "1-5", then qualifies for Group 2 – Light Ramp Users (check quotas).
If respondent does not qualify for either group (0 trips), discontinue and record as "no trips".

Q5A And, what is your primary reason for using this/these route(s)? **(Record all that apply below.)**

- Commuter to work/business -1 ()
- Hauling freight/goods/materials -2
- Making deliveries -3
- Transporting passengers -4
- Traveling to airport -5
- Visiting clients/other businesses -6
- Visiting friends/relatives/others -7
- School/education -8
- Shopping -9
- Entertainment (restaurants/movies/music/clubs/special events) -10
- Sporting events -11
- Appointments (medical/dental/business) -12
- Other purpose **(Specify):** _____ -13

Q5B Are you aware of alternate routes that you could use if this/these route(s) became congested or was closed for any reason?

- (Continue)** ----- Yes -1 ()
- (Skip to Q6)** ----- No -2
- (Skip to 6)** ----- Don't know/Not sure -3

Q5C How convenient is it for you to take this/these alternate route(s)?

- Extremely convenient -1 ()
- Very convenient -2
- Somewhat convenient -3
- Not very convenient -4
- Not at all convenient -5

Q6 And, what is your age, please? **(Read list if necessary.)**

- (Discontinue, and record as "wrong age")** ----- Under 18 -1 ()
- 18-29 -2
- 30-39 -3
- 40-49 -4
- 50-65 -5
- 66 and over -6
- (Discontinue, and record as "wrong age")** ----- Refused -7

Q7 Do you, or any member of your household and friends work for ...? *(Read list. Check all that apply.)*

	<u>Yes</u>	<u>No</u>	<u>Not Sure</u>
• An Advertising Agency or Public Relations Firm	-1	-2	-3 ()
• A Newspaper, Radio or Television Broadcasting Company	-1	-2	-3 ()
• A Marketing or Opinion Research Company or Department	-1	-2	-3 ()
• A Local, State or Federal Government Agency	-1	-2	-3 ()

If “Yes/Not Sure” (codes “1” or “3”) to any of the above in Q7, then discontinue and record as “competitive industry”.

Q8 Within the **past 6 months** have you participated in a marketing research study where you were asked to attend a round table discussion?

(Discontinue, and record as “past participant”) ----- Yes -1 ()
(Continue) ----- No -2

Q9 ***(Do not read)*** Record respondent sex:

Female -1 ()
Male -2

***** STOP AND ASSIGN RESPONDENT TO GROUP BEFORE CONTINUING *****
***** IF QUOTAS FILLED THEN THANK AND DISCONTINUE INTERVIEW. *****

GROUP ASSIGNMENT GRID

Heavy Ramp User: Travel on designated routes (Q2 – codes 1-6) during weekday peak hours (Q3 – codes 1-3) at least 6 or more trips per week (Q4)

Light Ramp User: Travel on designated routes (Q2 – codes 1-6) during weekday peak hours (Q3 – codes 1-3) at 1-5 trips per week (Q4)

Interviewer: *If respondent does not qualify for either “Heavy or Light Ramp Meter User” groups, then thank and discontinue interview.*

Important: Please make sure that group sessions contain:

- **Heavy Ramp Meter Users Only** - at least 3-4 participants who travel the designated routes during peak hours for business/commercial-related purposes (Q5 – codes 2-6)
- An equal mixture of participants who reside/located either inside (urban) or outside (suburban) the Twin Cities area – 50/50% split.
- A mixture of participants who use roadways with “convenient alternate routes” or “non-convenient alternate routes” – 40/60%. Where,
 - A “convenient route” is: “Yes” to Q5B and Q5C codes 1-2;
 - A “non-convenient route” is: “No” to Q5B, or, Q5B is “yes” and Q5C codes 3-5
- An equal mixture of females/males representing each of the six different age categories.

INVITATION

We are contacting people like yourself to ask you to participate in an informal, round table discussion. The discussion will focus on your opinions about traveling within the greater Twin Cities region. As a token of our appreciation, you will be given (\$____) for your participation. Refreshments will be served during the discussion and no attempt will be made to sell you anything. This discussion is being conducted for research purposes only.

Q10 The discussion will last approximately 1 1/2 hours, and will be held on (date) and (time) at our facility. Will you be able to attend?

(Continue) ----- Yes -1 ()
 (Discontinue, and record as "not agree") ----- No -2

Prior to attending the discussion, I'd like to ask you a few more brief questions.

Q11 Do you use your own vehicle or a company vehicle for **most of your weekday** trips on the route(s) you previously mentioned?

Use Own Vehicle -1 ()
 Use Company Vehicle -2
 Don't Know/Refused -3

Q12 What is your primary occupation? **(Record exact verbatim below.)**

Primary Occupation: _____ ()

Q13 Also, what is your total annual household income before taxes? Would it be ... **(Read ranges below.)**

Under \$15,000 -1 ()
 \$15,000 to under \$25,000 -2
 \$25,000 to under \$40,000 -3
 \$40,000 to under \$75,000 -4
 \$75,000 to under 100,000 -5
 \$100,000 to under \$150,000 -6
 \$150,000 and over -7
(Do not read) ----- DK/Ref. -8

Give verbal directions to focus group facility and continue with:

Thank you very much for your cooperation. We will look forward to seeing you on (date) at (time). We have invited only a limited number of people, and we are counting on your attendance. We will call you a day or two prior to the group discussion to confirm your attendance. We will also be sending you a letter containing directions to our facility. Finally, may I please verify your:

Name: _____

Street Address: _____

City: _____ State: _____ Zip: _____

Telephone Number: _____

If you have any questions, please call us at (phone number).