MARKET RESEARCH FOR METRORAIL FEEDER BUS SERVICE IN CENTREVILLE, FAIRFAX COUNTY, VIRGINIA

JUNE 1986

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FINAL REPORT

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PREPARED FOR
NORTHERN VIRGINIA TRANSPORTATION COMMISSION

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1. INTRODUCTION

A new Metrobus route from Centreville to the Vienna Metro Station is scheduled to open in June, 1986. The Northern Virginia Transportation Commission, in cooperation with the Fairfax County Department of Transportation, sponsored a study in early 1986 conducted by Robert Hitlin Research Associates, Inc., and SG Associates, Inc. ("RHRA/SG") to estimate the potential patronage on this new route.

The study employed both traditional household survey techniques and several innovative procedures to arrive at the ridership estimates. The survey technique used a "dual frame" sampling approach. The first part of the approach used a self-administered questionnaire delivered to almost every household in Centreville that provided an opportunity for several workers in each household to respond. The second part of the methodology included a follow-up telephone survey of 200 non-respondents to the initial household survey to check for potential response bias.

Transit market research often produces patronage estimates that turn out to be higher than actual ridership on proposed new services. This tendency to overestimate usage is probably a result of respondents who would like to have the service available as a backup to their usual mode of travel, but who rarely use the proposed service themselves. To compensate for this tendency to overstate usage, survey responses were run through a series of criteria or "screens" to insure that only the most likely riders of the proposed service were actually included in the estimates.

DATA COLLECTION PROCEDURES

Household Survey

A focus group session was held with residents of Centreville to pre-test the wording of the questionnaire and procedures for distribution and collection. The focus group participants were randomly selected from the community and included some transit users.

The self-administered questionnaire was placed in a clear plastic "hanger bag" and attached to the front doors of 3950 households in the Centreville area (out of approximately 4200 dwelling units). Respondents were asked to place the completed questionnaire in the same plastic bag on their door for collection two days later. Each questionnaire had space for up to three workers employed outside the home to respond on the same questionnaire. Completed forms were collected from 1024 households (25.9%), representing 1733 workers employed outside the home.

Telephone Survey

Addresses of households that did not return the household survey became the universe used to draw the sample for the follow-up telephone survey. A person who responded to one survey was excluded from the universe of the other survey and thus the two groups were entirely independent of each other. Since the telephone survey was used to check for potential response bias in the door-to-door survey it was particulary important that the two samples not overlap.

The telephone survey was conducted within 5 days of the completion of the self-administered survey. Respondents to the telephone survey were asked about their own commuting habits and not about any other workers in their household. Two-hundred and fifteen (215) telephone interviews were completed and used as the sample of non-responding households.

The small scale telephone survey was conducted as a check on potential bias in the responses to the self-administered survey. If potential transit users had a much greater propensity than non-transit users to return the questionnaire, the possibility of over-estimating patronage when generalizing to the entire Centreville area existed. However, the characteristics and transit usage patterns of the respondents to the telephone survey were very similar to those of the self-administered survey. Therefore, for reasons of smaller potential sampling error, the final patronage estimates were derived solely from the larger sample in the self-administered survey.

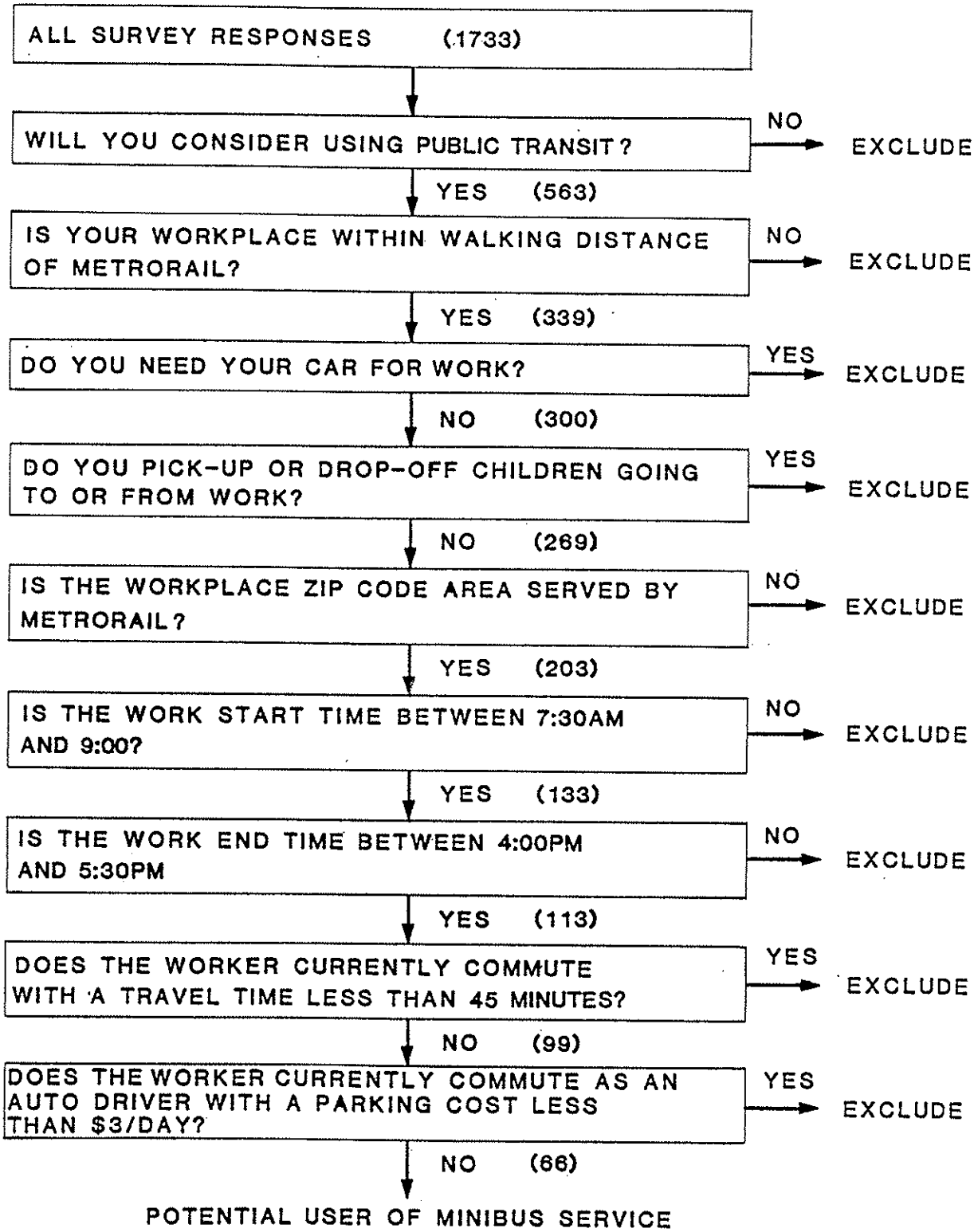
3. DATA ANALYSIS PROCEDURES

A total of 1733 workers responded to the household survey. Of these, 563 indicated an interest in using public transit when the new Orange line Metrorail stations open. These survey responses were run through a series of "screens" or filters that were designed to eliminate respondents who would be unlikely to actually use the new service. Several questions were included to distinguish between people who would like to have the service available but would probably not use it from those who would most likely use it. The questions that were used as filters are illustrated in Figure 1.

The screening process was successful in combing out many people who probably would not use the service despite their expression of interest to do so. The impact of this approach on the survey responses is illustrated in Table 1. Only respondents who passed all of the screens were included in the final estimates of potential riders.

FIGURE 1

TECHNIQUE FOR SCREENING SURVEY RESPONSES



NOTE: THE ORDER IN WHICH THE SCREENS WERE APPLIED AFFECTS THE NUMBER REMOVED AT EACH STAGE. THE ORDER DOES NOT AFFECT THE RESULT.

TABLE 1

IMPACT OF THE SCREENING PROCESS

	HOUSEHOLD SURVEY
TOTAL WORKERS RESPONDING	1733
WORKERS EXPRESSING INTEREST IN PUBLIC TRANSIT	563
WORKERS PASSING ALL SCREENS	66

The table illustrates the effect of this methodology compared to conventional ridership estimating techniques that rely on an expression of interest for patronage forecasting (i.e., 563 versus 66). For this reason we are confident that the final estimates are a realistic estimate of the number of Centreville residents who will use the new bus route.

Estimates were also adjusted for expected frequency of use. Even regular transit users will not commute to work every day. Vacations, sick leave, out-of-town travel and other factors reduce time at work. Surveys of travel reveal that 15-20% of workers do not report to their usual work place on an average day.

4. RIDERSHIP ESTIMATES

The estimates of potential ridership include all respondents who indicated a willingness to use public transit and who passed the screening process. Despite the fact that not all of these respondents indicated that they would use Metrobus to get to Metrorail, any respondent who passed all of the screens was included as a potential Metrobus user. It may be possible, for example, that some respondents intending to park/ride may discover that parking is not available when and where they want it. For this reason the patronage estimates should be viewed as upper limits.

Extrapolation of the likely ridership is based upon the return rates in each of the 7 areas of Centreville. Table 2 indicates the return rate of each area, the expansion factor associated with it, the potential ridership, and the potential sampling error associated with each estimate.

TABLE 2

RIDERSHIP ESTIMATES BY AREA (1)

Area	Return Rate (Household)	Expansion Factor	Number Passing Screen and Expecting to Use Bus Service	Expanded Estimate	Potential Sampling Error (2)
London Towne	17.2%	5.8	5	29	+/- 1.30% (25 people)
Newgate	19.6%	5.1	4	20	+/- 1.70% (20 people)
Country Club	32.7%	3.1	19	59	+/- 1.77% (26 people)
Kimanna	22.6%	4.4	1	4	+/- 1.58% (9 people)
Xanadu Estates	25.0%	4.0	3	12	+/- 2.69% (13 people)
Ratcliffes	29.7%	3.4	2	7	+/- 3.46% (11 people)
Patent	27.8%	3.6	6	22	+/- 1.96% (17 people)

Based on the current routing plan that will offer service to the London Towne and Newgate communities, we estimate a market of about 49 persons who may use the new service as walk-on riders.

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1 The current routing plan offers service to the the London Towne and Newgate areas only. The other 5 areas were included in the survey as candidates for possible future service.

2 In some cases the potential sampling error is larger than the estimate of ridership. However, this is not an error. It results from the fact that potential ridership is so rare in the community. For example, in London Towne with a potential ridership of only 1.5% of the respondents, a potential sampling error (at the 95% confidence level) of 1.3% is extremely large. However, if ridership were much higher the confidence interval would be a smaller proportion of the estimate.

Instead of using these results to estimate ridership, another way of looking at them is to estimate non-ridership. In that case the estimate for London Towne would be 98.5% +/- 1.3%. In this case the confidence interval is only a small fraction of the estimate.

We also estimate that 5% of the potential riders from other neighborhoods included in the market research will also use the service (park/ride, or by being dropped off), for a total of 54 potential riders.

On a typical workday about 80% of workers report to their principal place of work. Typical daily ridership is therefore, estimated to be 54 persons times 80%= 43 persons, yielding 86 daily rides (assuming equal morning and evening use).

5. DEMAND FOR EARLIER AND LATER BUSES

The ridership estimate is based on a one and one half hour range of work starting and ending times (7:30 - 9:00 A.M., 4:00 - 5:30 P.M.). A 3 hour range of starting and ending times (6:30 - 9:30 A.M., 3:30 - 6:30 P.M.) was also analyzed to gauge the impact of running earlier or later buses on the route.

Using the narrower time frame as a screen does have a major impact on the potential ridership. We estimate that offering service for a 3 hour morning and evening period would increase ridership by about 50% over the above estimates. However, this involves only 22 additional people.