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## APPENDIX A - METHODOLOGY AND SURVEY INSTRUMENTS

### INTRODUCTION

It is impractical to ask everyone in the city to complete a questionnaire. However, a representative sample of residents was selected to participate in the survey. Following a standard set of methods designed to select the survey sample will allow inferences about the total population based on the responses of those included in the sample. Following is the explanation of the procedures used in this survey.

### SELECTION PROCESS

Survey participants were selected using a stratified random sampling methodology. This methodology was selected because, in general, stratified sampling produces samples that are more representative of the population; random selection ensures that each member of the population has an equal chance of being selected.

To generate the stratified sample, the Des Moines population was divided into four sub-populations using Ward number as the stratifying element. After dividing the population into the four strata, a simple random sample was drawn from each sub-population. Unlike the methodology of selecting a single city-wide simple random

sample, the methodology used controls the relative size of each stratum rather than letting random processes control it, thus allowing for a more representative sample.

### SAMPLE FRAME

The Polk County Assessor's data were used as the basis of the sample frame. The Assessor's data base was selected because it is fairly complete, comparatively accurate, and relatively clean, with the names and addresses of property owners in the City of Des Moines in relationship to other lists. The Assessor's dataset also had less duplication of names and properties than, for example, a business billing system may have. Further, as the Assessor's data base is updated frequently, it provided the best chance of obtaining the correct name and address of potential survey respondents. Regarding the latter, it is important to be able to address a survey to a person who lives at a residence, as there is a far greater likelihood that the person will open a letter addressed to him or her by name rather than to "Occupant" or "Resident."

The Polk County Assessor's data base was provided in a digital geographic

information systems (GIS) format in September 2001. The data were pulled subsequently into the Arc/Info GIS environment for data editing and spatial patterning analysis. Once in the GIS format, the City's Ward boundaries were acquired from the Department of Community Development and used as an overlay to the Assessor's spatial data as a means for assigning, or coding, the correct Ward number to each parcel/property.

The edited Assessor's data were reviewed to delete unwanted listings, principally commercial businesses, property owners who lived outside the City of Des Moines, and owners with multiple properties (i.e., a single owner of multiple apartment complexes). The result of the editing was the identification of property owners who lived at their resident addresses. The list was reflective principally of homeowners and did not represent the population who rented their home or apartment. To help address this problem, the multiple properties listed in the Assessor's data identifying only one owner were crosschecked with the July, 2001 utilities billing addresses. As a supplement to both the utilities billing list, the November, 2001, Qwest telephone book for Des Moines was used to cross-check for name and address accuracy. Although this did

boost the potential survey population a bit, it was obvious that no small proportion of the utilities bills were paid for by a commercial entity. As a result, the responses of the returned surveys largely represent homeowners.

The editing and checking of the addresses as described above resulted in a population of approximately 57,000 Des Moines properties and addresses divided among the four Wards. As this was a stratified random sample selection procedure, just over 1,500 names were selected from each Ward, or sub-population. Random sampling was selected to generate the 1,500+ addresses from each Ward; the sampling process gives each member in the sample an equal chance of being selected. Once the sub-populations were identified, over 40 percent of the addresses and names for each Ward were re-examined for quality assurance. This process resulted in a defined survey sample of 6,102 residents.

### **SURVEY DESIGN**

Over 200 questions were developed to address the 12 issue areas identified in the Des Moines Today and Tomorrow Strategic Plan. (Please refer to the Introduction). Three surveys were developed, each posing questions about four of the 12 issue areas and common

demographic items. There were color-coded to track the number of responses for each issue area. A copy of the surveys is included in this Appendix.

### **SURVEY MAILING**

A preliminary letter alerting residents of a forthcoming survey was mailed May 15, 2002. The first, and only, mailing of the surveys occurred the week following the pre-survey letter. Each of 6,102 mailed surveys contained a cover letter from the Mayor's office about the survey, instructions on how to complete the survey, and a return envelope.

Completed surveys started coming back in early June. The first mailing resulted in the return of 30 percent of the total number of surveys mailed by the end of July 2002. As the City was satisfied with the 30 percent return rate, no survey follow-up, such as mailing a reminder card, or resending the survey to non-response addresses, was done.

Overall 1,782 surveys were returned, for a return rate of 30 percent. Table AA-1 lists the return rate by survey color and Ward. Table AA-2 lists the Issues covered in each of the three surveys.

### **SURVEY ERROR**

Sampling error occurs when less than a full population is surveyed. Using random sampling, however, allows for the characteristics queried in a survey to be estimated, with precision of, for example,  $\pm 3$  percentage points of the population's characteristics.

For this survey, the precision of the sample was selected to be  $\pm 3$  percentage points. This means that, for the Des Moines sampling frame of over 55,000 residents/addresses, 1,068 completed, returned surveys are required to yield results that are within  $\pm 3$  percentage points of the population with 95% confidence. As 1,782 complete surveys were returned to the City of Des Moines, the results are well within the  $\pm 3$  percentage point margin of error.

Although 1,782 usable surveys were returned, the number of usable surveys for each of the three sets of issue areas or for each of the four Wards was far less; on average 594.0 surveys were returned per issue area set (see Table A-2), and 445.5 were returned per Ward. Even so, this did not greatly affect the margin of error, which was between  $\pm 4$  to 5 percentage points.