DESIGN OF NASS: SUPPLEMENTAL INFORMATION FOR PLANNING THE NATIONAL ACCIDENT SAMPLING SYSTEM

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16. Abstract

This report is an addenda to the design of a National Accident Sampling System (NASS), originally prepared by HSRI for the Office of Statistics and Analysis of the National Highway Traffic Safety Administration.

Revisions to the NASS design have been made with regard to both the primary sampling units and the sample allocation. The first of these is done to provide OSA with greater flexibility in decision making with regard to NASS implementation by providing a larger number of options as to the basic PSU size to be used in the system. The second task provides a restructuring of the cost estimates for various PSU configurations together with the effect of the structures on the accuracy of estimation of national rates and trends forming the major product of the Continuous Sampling Subsystem of NASS.

This document, taken together with the original design report dated July, 1975, should provide OSA with a significantly broader base in its deliberations for implementing a specific NASS design.

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1. INTRODUCTION

This report is an addenda to the design of a National Accident Sampling System (NASS), originally prepared by HSRI for the Office of Statistics and Analysis of the National Highway Traffic Safety Administration.

Revisions to the NASS design have been made with regard to both the primary sampling units and the sample allocation. The first of these is done to provide OSA with greater flexibility in decision making with regard to NASS implementation by providing a larger number of options as to the basic PSU size to be used in the system. The second task provides a restructuring of the cost estimates for various PSU configurations together with the effect of the structures on the accuracy of estimation of national rates and trends forming the major product of the Continuous Sampling Subsystem of NASS.

This document, taken together with the original design report dated July, 1975, should provide OSA with a significantly broader base in its deliberations for implementing a specific NASS design.

2. REVISED SAMPLE ALLOCATION FOR NASS

This section of the report is concerned with delineating different allocations of the workload within each of the PSUs, considering the costs of the various data collection team compositions and the case load production which can be expected to result from each of these. This later method of analysis, suggested by OSA, allows a better exploration of the interaction between the accident production of varying minimum sized PSUs and the within-PSU sampling fractions assigned to achieve the desired case mix.

Three different cost estimates were combined to provide the basis for analysis, and these were considered in conjunction with varying case output for differing team sizes, and with the rates of homogeneity and the standard errors of estimate on key accident variables. The trade-offs among operating costs for a particular size PSU, the case output of each team, and the accuracy of the estimates provided on key variables can be evaluated with a view toward the optimization of the number of PSUs.

2.1 Revised Costs of PSU Teams

The two major variables considered in this portion of the cost revision of PSU teams are the number of full-time employees at each team site and the corporate affiliation of the teams.

The three different corporate affiliations of the teams considered in this analysis are 1) a university or similar institution, 2) a non-profit research corporation, and 3) a self-contained, profit-making corporation. The major differences in the costs of the three types of operations is in the way in which the direct labor charges are burdened. Variations will, of course, occur between different contractors within a single category, but our numbers can be used as reasonable examples of each type. Table 2.1.1 expresses the various components of the burdening process in percentages of the direct labor costs. The final row of figures is the multiplier to be used for each organizational type in calculating the total personnel costs after estimating manpower requirements. Note that this formulation requires an estimation of total labor costs including fringe benefits, overhead and fee, not annual salary.

Using these burdening factors, together with the cost estimates provided by HSRI in the NASS report, we can calculate operating costs for teams of various sizes for the three different organizational structures. The only additional assumptions needed have to do with the increased office and transportation expenditures required as team size is augmented. Table 2.1.2 presents these data, in terms of operating costs based on 1974 dollars.

NHTSA had asked both Calspan Corporation and Southwest Research Institute to compile cost figures of a similar nature. We have reviewed both documents and find them very reasonable in their assumptions and their methods.

TABLE 2.1.1. BURDEN FACTORS FOR VARIOUS CORPORATE STRUCTURE

	University	Non-Profit	Profit
Retirement	.10	.08	.08
Insurance, etc.	.15	.12	.12
Vacation	.10	.06	.06
Overhead	.70	1.00	1.00
Fee	0	.06	.12
Burden Factor	2.295	2.671	2.822

TABLE 2.1.2. FIELD TEAM COST ESTIMATES - ESTIMATES FROM: HSRI

	TEAM SIZE			
	4	5	6	7
Personnel Costs				
Team Chief ($15,583)	15,583	15,583	15,583	15,583
Field Investigator ($11,000)	22,000(2)	33,000(3)	44,000(4)	55,000(5)
Sec/Interviewer ($8,250)	8,250	8,250	8,250	8,250
Total Salary	45,833	56,833	67,833	78,833
x 2.295 Univ.	105,187	130,431	155,677	180,922
x 2.671 Non-Profit	122,400	151,801	181,182	210,563
x 2.822 Profit	129,341	160,383	191,425	222,467
Direct Costs				
Office (@ $4.5/ft^2)	2,700(600)	3,150(700)	4,050(900)	4,950(1100)
Vehicles (@ $2400 each)	7,200(3)	9,600(4)	12,000(5)	14,400(6)
Telephone	900	1,200	1,500	1,800
Computer Terminal	1,300	1,300	1,300	1,300
Office Equip. (@ $250/person)	1,000	1,250	1,500	1,750
Supplies (@ $150/person)	600	750	900	1,050
Total Direct	13,700	17,250	21,250	25,250
Grand Total				
Univ	118,887	147,681	176,927	206,172
Non-P	136,120	169,051	202,432	235,813
Profit	143,041	177,633	212,675	247,717

Because their formats differ somewhat from the one we used, the pertinent numbers have been extracted and put in similar tables for comparative purposes (Table 2.1.3 and 2.1.4). The scope of the SwRI report was particularly large, taking into account regional differences in the country, and the figures we used for salary levels were those from the south.

We note some differences in the three estimates, many of them considerable. It seems, however, that the major discrepancies appear in the area of direct costs rather than in any of the personnel categories.

It is possible to project the NASS operating costs to 1980 and these figures appear in Table 2.1.5. The projection was done using an annual inflation factor of seven percent, and was calculated for two different levels of operation, as explained in the footnote on the table.

TABLE 2.1.3. FIELD TEAM COST ESTIMATES - ESTIMATES FROM: CALSPAN

	TEAM SIZE			
	4	5	6	7
Personnel Costs				
Team Chief (\$17,900)	17,900	17,900	17,900	17,900
Field Investigator (\$13,700)	24,400(2)	41,100(3)	54,800(4)	68,500(5)
Sec/Interviewer (\$10,500)	10,500	10,500	10,500	10,500
Total Salary	55,800	69,500	83,200	96,900
x 2.295 Univ.	128,061	159,502	190,944	222,386
x 2.671 Non-P	149,042	185,634	222,227	258,820
x 2.822 Profit	157,468	196,129	234,790	273,452
Direct Costs				
Office (@ \$6.5/ft^2)	2,900	3,600	4,200	4,900
Vehicles (@ \$____each)	4,000	6,100	6,100	8,200
Telephone	600	600	600	900
Computer Terminal	1,500	1,500	1,500	1,500
Office Equip (@ \$____/person)	6,500	6,900	7,900	8,500
Supplies (@ \$____/person)	800	1,000	1,200	1,400
Extra*	7,200	8,200	11,100	16,500
Total Direct	23,500	27,900	32,600	41,900
Grand Total				
Univ.	151,561	187,402	223,594	264,286
Non-P	172,542	213,534	254,827	300,720
Profit	180,968	224,029	267,390	315,352

*Purchased services + Field Equip.

TABLE 2.1.4. FIELD TEAM COST ESTIMATES - ESTIMATES FROM: SwRI

	TEAM SIZE			
	4	5	6	7
Personnel Costs				
Team Chief ($15,100)	15,100	15,100	15,100	15,100
Field Investigator ($12,000)	24,000	36,000	48,000	60,000
Sec/Interviewer ($6,260)	6,260	6,260	6,260	6,260
Total Salary	45,360	57,360	69,360	81,360
x 2.295 Univ.	104,101	131,641	159,181	186,721
x 2.671 Non-P	121,157	153,209	185,261	217,313
x 2.822 Profit	128,006	161,870	195,734	229,598
Direct Costs				
Office (@ $6/ft^2)	3,600(600)	4,200(700)	4,800(800)	5,400(900)
Vehicles (@ $2410 each)	7,230(3)	9,640(4)	12,050(5)	14,460(6)
Computer Terminal	2,100	2,100	2,100	2,100
All Other	15,638	15,881	16,125	16,368
Total Direct	28,568	31,821	35,075	38,328
Grand Total				
Univ.	132,669	163,462	194,256	225,049
Non-P	149,725	185,030	220,336	255,641
Profit	156,574	193,691	230,809	267,926

TABLE 2.1.5. ESTIMATED TOTAL NASS OPERATING COSTS ($ x 10^3)

	1975 $ Est (HSRI)		1980 $ @ 7% Annual Increase	
	Low[1]	Mid[2]	Low	Mid
PSU	120	166	168	232
35 PSU	4200	5810	5891	8149
Zone Center	209	223	293	312
6 Zone Centers	1254	1338	1759	1877
Data Central	270	306	379	429
Total	5724	7454	8028	10455

[1] Low = 4-man, Univ Op Team, 6 U Zone

[2] Mid = 5 1/2-man, N-P Op Team, 6 N-P Zone

2.2 Redefinition of the Cost Function

The next step in the redefinition of the NASS cost function, after the team size and team affiliation variables have been considered, is to estimate the team output. This output is measured in terms of the number of cases produced per year of operation, and it is a function of two further variables: 1) the depth of investigation conducted by the team, and 2) the characteristics of the geographical area within which the team must work.

Two different data forms were used as a basis for the estimates of the depth of investigation variable: 1) our CSS form provided in the NASS design report and 2) the NCSS form which was developed at NHTSA and intended for the NCSS program. A variation of the two, or a hybrid, consisting of 1/3 HSRI CSS content and 2/3's NCSS content, is used as a third basis of cost estimates.

To provide a basis for comparison between the HSRI CSS form and the NHTSA NCSS form, a tabulation of key data elements in each form was made. This is given in Table 2.2.1. The right hand column, "Case Unit Points", is an estimate of time in minutes to acquire the necessary information in each data element category. It's a measure of data complexity and detail, as well as the difficulty in acquiring the data. It also includes interpreting and recording of the data.

As the totals show, time estimated to do a HSRI CSS case is a little over nine (9) hours, while time for a NHTSA NCSS case is a little over 11 hours. Both include site visits, as the data requirements indicated. In the HSRI CSS form however, site visits were proposed only for accidents where one, or more, vehicles in the crash left the roadway. With the NHTSA NCSS form, site visits are required for grade measurements and determining roadway

	HSRI CSS	Unit Points	NCSS	Unit Points
Accident General (Office)	Administrative, Classification, Selection Criteria + Police Info.	30	Administrative, Classification Selection Criteria + Police Info.	30
	Report Completion & Coordination	45	Report Completion & Coordination	45
	Report Review & Check	30	Report Review & Check	30
Vehicle Examination (Field)	Travel (Avg.)	90	Travel (Avg.)	90
	VIN-OD-Vehicle Description	15	VIN-OD-Vehicle Descriptive	15
	Internal - damage contacts - structural integrity - shear cap separation - seat type - seat damage - head restraint perfomrance	30	Internal - occupant contacts - seat type - head restraint type, adjust & measurements	30
	Exterior - VDI-crush-collision event - tires; type & condition - doors; condition/perform. - hood; condition/perform. - windshield; condition/perf. - door beam; assess - fire & fuel system-assess - speed estimation	45	Exterior - VDI-crush-collision event	30
	Damage Description - Graphic	6	Vehicle Dynamics Quantified - impact position -rotation & direction - rest position - roll resis't estimates	60
Accident Site Examination (Field)	Travel (Avg.)	90	Travel (Avg.)	90
	Roadway & Roadside Assessment - grade - curvature - radius - barriers - drop-offs-shoulder - maintenance - obstacles	45	Roadway - coefficient friction - grade measurement	15
Human Data (Office and/or Field)	General Occupant Data - physical description - ejection assessment - driver training - vehicle & route familiarity familiarity - trip origin, destination & purpose - driver violations	15	General Occupant Data - physical description - ejection assessment	10
	AIS & Treatment + Injury Sources/ Contacts	45	AIS & Treatment + Injury Sources/ Contacts	45
			Injury Surgical Procedure	15
			Hospitalization Duration	15
			Outpatient Medical Visits	15
			Incapacitation Assessment - work - activity restrictions	15
	Time (Avg.) - Contact and/or Arrange Interview with Subject(s)	60	Time (Avg.) - Contact and/or Arrange Interview with Subject(s)	120
	Total	546	Total	670

coefficient of friction. These are indicated for all accidents. Thus, the comparisons must be tempered with these differences.

Adjusting the total time (9.1 hours) of an HSRI investigation including a site visit, in relation to the expected percentage of accidents involving one car leaving the roadway*, gives a total of 441 1/2 minutes, or a little under 7 1/2 hours per case. This makes an average NHTSA NCSS case nearly four (4) hours greater to complete than an HSRI CSS case.

In addition to the differences in the frequency of site visits, a major cause of this disparity is in the NCSS medical data requirements which involve following up with an injured occupant to determine detailed medical treatment, duration of hospitalization, out-patient treatment and an assessment of degree of incapacitation over time. If this follow-up requirement were not necessary, the NHTSA NCSS form would still require about two (2) hours greater effort, on an average case, than the HSRI form. This two (2) hour difference is mainly the difference between the two in site examination requirements.

Estimates of the yearly number of cases which can be completed for various size field investigation teams are given in Figure 2.2.1. The figure shows the estimated case output for three different size PSUs with different amounts of necessary travel and for four different levels of investigative effort. Also, it assumes that each investigation team consists of full time, fully trained, experienced personnel with productivity of 1,540 hours per year. (This productivity figure has been adjusted for vacations, holidays, illness and administrative - "housekeeping" chores.)

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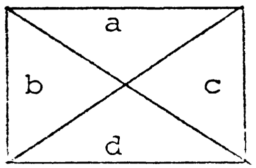
*Based on State of Michigan 1974 total accident experience; 22 1/4 percent of all accidents were off-road accidents.

KEY:



a = number of cases per year produced by 4-man team
b = by 5-man team
c = by 6-man team
d = by 7-man team

Depth of Investigations		PSU TYPE		
		Large SMSA 500 mi.^{2}	Dense Non-SMSA 2000 mi.^{2}	Sparse Non-SMSA 20,000 mi.^{2}
	HSRI CSS Form	730 940 1150 1360	680 860 1080 1280	630 810 990 1170
	NHTSA NCSS Form	480 620 760 900	460 590 720 850	420 550 670 790
	NCSS Form No Trajectory No Site-Exams	640 820 1000 1190	620 790 970 1140	590 760 920 1090
	Composite CSS-NCSS Form No Site-Exams	630 810 990 1180	610 780 960 1130	580 750 910 1080

FIGURE 2.2.1. NASS CASE ESTIMATES

Each team will have a team manager, and it is estimated that only 50 percent of his time could be utilized in case field work. The remainder of the team manager's time will be used for administrative activities, liaison with local public officials and the overseeing of all case investigation activities. Thus, a four (4) man-team could provide 5,390 hours of total investigative work, a five (5) man-team 6,930 hours, a six (6) man-team 8,470 and a seven (7) man-team 10,010 hours. The per case cost estimates in Table 2.2.2 are based on these hourly totals.

The results of this are in complete agreement with our intuition as to how the cost per case should vary with the four variables under consideration. The more sparsely populated the area the greater would be the cost per case. Cost also increases as investigations become greater in depth and as the team becomes more expensive in its corporate affiliations. As the team size becomes larger the cost per case is reduced, probably due to the efficiency produced by a smaller ratio of management to field personnel, but this efficiency seems to stop at about a six-man team. From these data, it would appear that a six person level of effort is optimum from a cost effectiveness point of view for field operations.

The data in the table above is based on only one of the three estimates of cost, the one from Calspan Corporation which is the highest. These figures then may be considered to be on the high side of an average representing what the experience might be for a nationwide scale of operations. The extreme case costs from Calspan are $194 and $431, and the comparable figures for the same conditions representing the HSRI and SwRI estimates are presented in Table 2.2.3.

TABLE 2.2.2. INVESTIGATION COST IN DOLLARS PER CASE

Level of Investigation	Team Affiliation	Large SMSA 500 mi.^{2}				Dense Non-SMSA 2000 mi.^{2}				Sparse Non-SMSA 20,000 mi.^{2}			
		TEAM SIZE											
		4	5	6	7	4	5	6	7	4	5	6	7
CSS	U	208	199	194	194	223	218	207	206	241	231	226	226
	N-P	236	227	222	221	254	248	235	235	274	264	257	257
	P	250	238	233	232	266	260	248	246	287	277	270	270
NCSS	U	316	302	294	294	330	318	311	311	361	341	334	335
	N-P	359	344	335	334	375	362	354	354	411	388	380	381
	P	377	361	352	350	393	380	371	371	431	407	399	399
1/3 CSS + 2/3 NCSS	U	241	231	226	224	248	240	233	234	261	250	246	245
	N-P	274	263	257	255	283	274	265	266	297	285	280	278
	P	287	277	270	267	297	287	279	279	312	299	294	292

TABLE 2.2.3. COMPARISON OF ESTIMATES FOR EXTREME CASES - DOLLARS PER CASE

Conditions	Estimates From Calspan	 SwRI	 HSRI
CSS/University Large SMSA/7	194	165	151
NCSS/Profit Corporation Dense Non-SMSA/7	431	373	341

2.3 Stratified Sampling Within PSUs

Consideration should be given to utilizing stratified random sampling at each of the clusters where the accidents are investigated. To be of the greatest use, such stratification should be based on one or more variables which are present in the sampling frame. It is desirable to have relatively few strata - around ten or fewer. The variable or variables used for stratification should be as highly related to the most important dependent variables as possible. Since the main interest currently centers on key crashworthiness parameters of the vehicle in protecting the occupants, model year is one candidate variable for stratification. Another desirable variable is a variable highly related to crash severity or injury producing potential of the crash. The data available for stratification are expected to be those available on the police report of the accident. These will include data on the model year of the vehicle and typically some data on the injury producing potential of the crash. The data on the latter may be the police injury code (KABC), the disposition of the most seriously injured occupant (taken for treatment or not), or some vehicle damage variable such as the TAD scale.

Previous data show that even among towaway accidents, the bulk of the accidents result in minor injuries, with the more serious injuries becoming considerably more rare. This same sort of severity distribution is also apparent when one looks at a measure of crash severity such as inches of crush or Collision Deformation Code. If no stratification is used, most of the data observed will be at the lower end of the crash severity spectrum, while if interest is mainly in crashworthiness, additional data at higher crash severities would be desirable. Similarly, interest is probably higher for the newer models of vehicles. This would be the case if innovative design changes are to be evaluated for improvements in crashworthiness. On the other hand, changes in design have occurred in various models in the past, so comparing the pre- and post-change cars in the population is also of interest. This, together with the aim of describing the population, would imply that some sampling of older vehicles is desirable.

If one is interested in relating injury production to some crashworthiness parameters, it seems clear that stratification on some variable related to injury or crash severity will produce large gains in precision. In the RSES the police code "hospitalized" (i.e., injured occupant taken to hospital or not) was used as a stratification variable for accident severity. In terms of estimating the proportion of injuries of overall AIS 2 or more, this stratification resulted in reducing the sampling variance to about one-fourth that of simple random sampling. Although this may not be the best stratification variable for all questions, it is one which should be consistent over areas, and one which does result in large gains for variables related to crash severity.

Once the stratification variable has been selected, there remains the question of how the sample should be allotted to the different strata. A simple method often used is proportional to stratum size. This method is undesirable if either the cost of sampling varies considerably by stratum or if the variance within the strata varies considerably. Generally the goal of allocation is to make the optimum use of resources by minimizing variance for a fixed total sample size or - if sampling costs differ appreciably - for a fixed total cost. The stratification and allocation considerations used at the HSRI during the RSES and their results are used to exemplify these considerations.

When several variables are of interest, stratification can be optimum for only one of the variables. This results in a less than optimum design for the other variables, and could theoretically at least result in a variance larger than from simple random sampling for some of the other variables. As a consequence, any stratification when more than one dependent variable is of interest must be some sort of compromise. Fortunately the optima are usually rather flat so that mild departures from optimum allocation do not much affect the variances.

Several methods of allocation are suggested in Cochran (1963)* for the situation where several variables are of interest. These include:

a) Proportional allocation, in which the sample is allotted to the strata in proportion to the population proportion.
b) A compromise optimum in which the optimum allocation for each of several (up to six or so) variables is determined and the average of these is used as a compromise.
c) Allocation to minimize a linear combination of the variances of the individual variables.
d) Allocation to minimize a cost plus linear combination of variances.

Another aspect of stratification is that the maximum benefits are to be obtained only if the correct stratum weights are known, i.e., if

$$W_h = \frac{N_h}{N}$$

is known for each stratum in the population. Often, as was the case with the restraint system study and as will

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*Cochran, W.G. Sampling Techniques, 2nd ed., Cambridge: Harvard University Press, 1963.

be the case with the NASS, these weights may not be known exactly and may have to be estimated. In this case the estimates are biased by the term

$$\sum_{h=1}^{L} (w_h - W_h)\overline{Y}_n \quad \text{or} \quad \sum_{h=1}^{L} (w_h - W_h)P_h$$

if one is estimating a mean or proportion respectively. In this case one has to deal with the mean square error = Var + bias^2 rather than the variance alone. Notice that the bias due to lack of knowledge of correct stratum weights does not depend on the sample size. Thus for sufficiently large samples one would be better off using simple random samples than stratified random samples if the stratum weights are not known exactly.

In general, even a non-optimum allocation to the strata will result in a smaller variance than would simple random sampling. The exception occurs if the variable under investigation is not related to the stratification variable so that the variation within the strata becomes larger than the variables between strata. (For a continuous variable this means that the between strata mean square is less than the within strata mean square.) In terms of sampling for proportions, stratified sampling can result in a loss of precision relative to simple random sampling if the proportion being estimated does not vary much from stratum to stratum. The loss becomes larger if allocation is not optimum.

As an example of the effect of stratification on the variance estimates of proportions, consider the data collected by HSRI for 12 months of the restraint system evaluation study. In this study there were four strata defined from variables on the police report. The sampling frame was the set of police reported towaway accidents involving late model (1973-74) vehicles sold by American manufacturers. Cases were stratified by model year and by the police-reported variable "Injured taken to ____." This resulted in four strata:

1973 model, some occupants taken to hospital - 73H
1973 model, no occupant taken to hospital - $73\overline{H}$
1974 model, some occupants taken to hospital - 74H
1974 model, no occupant taken to hospital - $74\overline{H}$

The primary point of interest was to estimate the difference by model year of the proportion of occupants who received an injury of overall AIS severity 2 or greater. The allocation of the sample to the four strata was intended to minimize the variance of this difference in proportions. Thus the allocation was not optimum for estimating the proportion of injuries of AIS severity 2 or greater. The actual allocation of sample size, n_h, to the four strata and the population sizes N_h are given in Table 2.3.1.

A number of points should be noted. First, 100 percent sampling was used in strata 73H and 74H. This was due to the fact that optimum allocation called for more observations in these strata than the population contained. Secondly the N_h were not known exactly at the time of design. Consequently the n_h were determined on the basis of estimated values and are thus not quite optimum. The allocation represented by the line $n_h{}^*$ would have been the optimum allocation for estimating the population proportion of AIS (2+)'s with complete knowledge of the N_h.

Consider now a second variable of interest: the distribution of these occupants by sex. Table 2.3.2 gives the data observed in the study.

TABLE 2.3.1.

Strata	73H	$73\overline{H}$	74H	$74\overline{H}$
n_h	328	335	321	458
N_h	328	1021	321	896
n_h^*	328	403	321	390

TABLE 2.3.2.

Stratum	73H	$73\overline{H}$	74H	$74\overline{H}$
# AIS 0-1	241	331	240	451
# AIS 2+	87	4	81	7
# Male	172	205	176	276
# Female	156	130	145	182
$\hat{p}$ (I)	.265	.012	.252	.015
$\hat{p}$ (M)	.524	.612	.548	.603

Using these one estimates that the proportion of more than moderate injuries (AIS 2+) is

$$p(I) = \frac{328(.265) + 1021(.012) + 321(.252) + 896(.015)}{2566}$$

$$= .0754$$

Similarly the proportion of males is estimated to be

$$p(M) = .5896$$

The general formula is

$$p = \frac{\Sigma N_h p_h}{\Sigma N_h}$$

where p_h is the proportion observed in stratum h.

The variance from a stratified sample is estimated as:

$$\hat{V}(p_{st}) = \frac{1}{N^2} \Sigma \frac{N_h^2 (N_h - n_h)}{(N_h - 1)} \frac{p_h q_h}{(h_n - 1)}$$

Substitution from Tables 2.3.1 and 2.3.2 gives the estimate

$$\hat{V}(\hat{P}(I)) = .0000057$$

for the proportion injured, and

$$\hat{V}(\hat{P}(M)) = .0001061$$

for the proportion of males.

To see the effect of the stratification on the variance, consider what the variance estimates would have been using the same total sample size (1442) and a simple random sample. The variance is estimated by the formula

$$\hat{V}_{SRS} = \frac{(N-n)}{(n-1)} \frac{p\ q}{(N-1)}$$

where p (and q = 1-p) are the sample estimates of the proportion. These are assumed the same as from the stratified sample. Here,

$$\hat{V}_{SRS}\ (\hat{P}(I)) = .0000211$$

and

$$\hat{V}(\hat{p}(M)) = .0000735$$

Thus in the case of the proportion (moderately or more) injured, stratification has a relative precision of

$$\frac{V_{st}}{V_{SRS}} = .270$$

That is, the variance of the stratified estimate is only 27 percent of the variance had stratification not been used. However, in the case of the proportion of males

$$\frac{V_{st}}{V_{SRS}} = 1.444$$

That is, stratification has resulted in a 44 percent larger variance.

The gain from stratification for the proportion injured results from the fact that the stratum proportions are very different, ranging from .265 down to .012. Also, the allocation is not too far from optimum for this variable. On the other hand, the proportion of males varies very little--from .524 to .612. Consequently, little or no gain would be available from this stratification in any case and the allocation has resulted in a loss of precision.

Even though one has sacrified precision on estimating the proportion of males in the occupant population, this may not be viewed as serious, depending on the amount of interest in that variable. If the coefficients of variation are calculated for P(I) and P(M), one finds

C.U. (P(I)) = 3.2%

and

C.U. (P(M)) = 1.7%

so that in this sense, one still has more precise information on the proportion of males than on the proportion of moderately injured occupants.

It may appear that much of the advantage of stratification in the case of P(I) has come from the fact that the finite population correction factor has resulted in a contribution of zero to the variance for two of the strata. This may not be viewed as realistic. To investigate this point we assume a population large enough so that the finite population correction factor can be ignored. Assume that the four strata have the same frequencies in the population and that the sample proportions are the same. We first allocate n = 1442 optimally on the basis of estimating P(I) and compare the results with simple random sampling. Then we allocate the sample optimally for P(M) and compare the results.

Optimum allocation results from

$$n_h = \frac{n\ W_h\ \ p_n q_n}{W_h\ \ p_n q_h}$$

where the p_h are the stratum proportions of the variable in question. The allocation are given as n_h (for P(I)) and m_h (for P(M)) in Table 2.3.3.

For the first allocation one finds that the variance of P(I) (omitting the fpc) is

$$V_{st} = .0000255 \ ,$$

while that of a simple random sample would be

$$V_{SRS} = .0000472 \ ,$$

so that stratification reduces the variance to 54 percent of what it would have been. The variance is considerably larger than when sampling from a finite population of N = 2566, of course.

For P(M) one finds

$$V_{st} = .0002284 \ ,$$

while

$$V_{SRS} = .0001679$$

So that stratification has resulted in a 36 percent increase in variance.

TABLE 2.3.3.

Strata	73H	$73\overline{H}$	74H	$74\overline{H}$
W_h	.12	.41	.12	.35
P(I)	.265	.012	.252	.015
$P(M_h)$	.524	.612	.548	.603
n_h	406	334	379	323
m_h	176	587	176	503

Using the allocation for estimating the proportion of males, one has for P(I)

$$V_{st} = .0000381$$

compared to the optimum of .0000255 and SRS of .0000472.

For P(M)

$$V_{st} = .0001669$$

compared to the previous value of .0002284 and the value of .0001679 from SRS. It can be seen that even the best allocation does not result in much improvement over SRS for estimating the proportion of males. However, the stratification results in large gains when estimating the proportion of injured occupants. If the distribution by sex of the occupants were of primary interest, either simple random sampling should be used, or some other stratification variable should be sought.

On the other hand, stratification to reduce the variance by 50 percent or more may result in an increase of 30 to 40 percent for the variance of other variables not related to the variable of stratification. This may be worthwhile if most variables of major interest are related to the stratification.

It is of some interest to note that had our initial estimate of the W_h been used in estimating the population proportion of AIS 2+, the bias would have been

$$b = -.0053$$

so that the mean squared error would have been

$$\begin{aligned} MSE &= Var + b^2 \\ &= .0000057 + .0000282 \\ &= .0000339 \end{aligned}$$

giving a coefficient of precision of

$$\frac{.0058}{.0682} \times 100 = 8.5\%$$

rather than the coefficient of variation of 3.2 percent obtained by using the correct weights.

As an example of stratification the NASS report considered seven classes of accidents (see p.53).

(1) Fatal
(2) Late Model, Hospitalized
(3) Late Model, Not Hospitalized
(4) Early Model, Hospitalized
(5) Early Model, Not Hospitalized
(6) Pedestrian and Bicyclist
(7) Motorcyclist

Of these classes 2 through 5 are restricted to towaway accidents. Classes 6 and 7 are subpopulations of interest in their own right. Few variables, if any, would be estimated for the total population across all seven classes. Fatalities are events of special interest, which is why a 100 percent sampling rate is suggested for them. Classes 2 through 5 comprise a stratification of a population for which estimates of various variables would be desired.

Assuming that the PSU has an expected total of about 2500 eligible accidents, about 2160 of which fall into classes 2 through 5, let the variable of interest be the proportion of AIS (2+) in the population. Then the optimum allocation results in the following sample rates and expected sample sizes: (assuming that p_h = .25 for classes 2 and 4 and p_h = .02 in classes 3 and 5).

Class	Sample Rate	Sample n
2	31.8%	54
3	9.2%	34
4	32.3%	167
5	10.5%	115

Practical considerations of implementing the sampling might suggest a sampling fraction of 1/3 in classes 2 and 4 and of 10 percent in classes 3 and 5. These would result in a variance of about 0.0001343 if one used the sampling rates of 50 percent, 20 percent, 20 percent, and 10 percent as suggested in the report. The latter non-optimal allocation results in a relative increase in the variance of 24 percent, which is not too serious. Since the proportion of AIS (2+) is only one variable of interest and allocation will only be optimum for one variable the sampling rates suggested originally may be preferable. This would be the case if differences among late model and early model vehicles are of particular interest, since then one would want a larger proportion of the newer vehicles.

One general conclusion is that the variance of any variable related to injury severity is likely to be substantially reduced by stratification on the hospitalized code, even if the actual allocation is not optimum. This results in some loss of efficiency relative to simple random samples for non-injury related variables such as sex, or perhaps age of occupant. These variables are of less interest, so that the stratification is recommended.

Fatalities are of special interest. The injury severity may still have variability. The energy of the impact or other crash parameters may be very variable. These facts, together with the interest in fatalities as a special sub-class suggest a 100 percent sampling rate be used for fatals. If, for example, one wishes to estimate the cumulative fatality curve as a function of some crash severity variable, such as equivalent barrier speed, nearly all of the cases would be necessary. With about 1200 fatalities, which is about the number to be expected in NASS* if all fatalities are sampled, then the cumulative fatality curve would have a simultaneous confidence band of ±3.9 percent (except at the extremes where it decreases to +3.9 percent at the lower end and -3.9 percent at the upper). If only half the fatalities were investigated the width would be ±5.6 percent.

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*Assuming the 35 total PSUs suggested in the 1975 NASS report.

2.4 Rates of Homogeneity for Key Crashworthiness Parameters

Unfortunately, none of the ten key crashworthiness parameters (KCP) specified in the RFQ were available in any of the statewide accident files maintained by HSRI. Therefore the same 14 variables used in the original NASS report were also used for estimating rates of homogeneity, sampling errors, and design effects with different methods of stratification of counties. Three of these 14 variables are at least appropriate surrogates for the KCP. These are single vehicle accident, fatal accident, and "A" injury accident. The changes in estimates for these three variables should be of particular interest in Tables 2.4.1, 2.4.2, and 2.4.3.

All of the data presented in these tables come from analysis of 7,490 towed vehicles in the 5% sample of all 1973 Michigan police-reported traffic accidents. The seven methods stratifying and clustering the 83 Michigan counties into Primary Sampling Units are discussed in more detail in Section 3. However, brief descriptions of the seven methods are given in the chart below.

Method	Minimum Size Criterion	Types of Strata	No. of Non-Empty Strata	No. of PSUs
A	50,000 people	Urbanicity, Gas Sales	9	43
B	85,000 people	Urbanicity, Gas Sales	7	34
C	86,000 people	Urbanicity, Interstate Highways	6	31
D	200,000 people	Urbanicity, Interstate Highways	6	21
E	$17,000,000 Gas Sales	Urbanicity, Interstate Highways	6	33
F	$34,000,000 Gas Sales	Urbanicity, Interstate Highways	6	21
G	100,000 people	Urbanicity, Gas Sales	7	33

TABLE 2.4.1. SAMPLING ERRORS FOR 14 VARIABLES IN MICHIGAN 5% SAMPLE OF TOWAWAY ACCIDENTS BY SEVEN DIFFERENT METHODS OF STRATIFICATION AND PSU CONSTRUCTION

		Method						
	%	A	B	C	D	E	F	G
Interstate Highway Accident	6.4	2.33	2.35	2.09	1.90	2.15	1.84	2.07
Single Vehicle Accident	47.3	5.71	5.60	5.15	5.56	5.09	5.56	4.61
Ped/Bicyclist Accident	0.5	.22	.22	.23	.20	.23	.20	.22
Fatal Accident	1.7	.58	.57	.61	.65	.60	.59	.59
Nighttime Accident	7.5	.59	.52	.55	.47	.56	.57	.58
Sunday Accident	14.0	1.21	1.11	1.00	1.04	1.00	1.06	1.05
"A" Injury Accident	12.6	1.45	1.49	1.22	1.16	1.26	1.16	1.05
NO Injuries Accident	45.0	2.80	2.73	3.05	2.87	3.09	2.83	3.47
1972-74 Model Vehicle	26.0	1.56	1.47	1.40	1.10	1.43	1.23	1.45
Senior Citizen Driver	6.1	1.46	1.45	1.29	1.14	1.32	1.14	1.34
Truck Vehicle Type	8.8	2.34	2.36	2.28	2.33	2.29	2.33	2.24
Female Driver	27.1	1.95	1.99	2.07	1.82	2.09	1.77	2.21
"C" Injury to a Vehicle Occupant	19.0	2.61	2.61	3.02	2.94	3.07	2.96	3.19
Motorcycle Vehicle Type	2.3	.25	.26	.29	.31	.29	.32	.30

Methods

A = 50,000 Population Minimum; 9 Density + Gas Sales Strata.
B = 85,000 population Minimum; 7 Density + Gas Sales Strata.
C = 100,000 Population Minimum; 6 Density + Interstate Strata.
D = 200,000 Population Minimum; 6 Density + Interstate Strata.
E = $17 Mil. Gas Sales Minimum; 6 Density + Interstate Strata.
F = $34 Mil. Gas Sales Minimum; 6 Density + Interstate Strata.

TABLE 2.4.2. DESIGN EFFECTS FOR 14 VARIABLES IN 1973 MICHIGAN 5% SAMPLE OF TOWAWAY ACCIDENTS BY SEVEN DIFFERENT METHODS OF STRATIFICATION AND PSU CONSTRUCTION

	Method						
	A	B	C	D	E	F	G
Interstate Highway Accident	10.7	10.9	8.8	9.2	9.1	8.6	8.4
Single Vehicle Accident	15.4	14.8	12.8	17.2	12.3	17.2	10.1
Ped/Bicyclist Accident	1.2	1.2	1.3	1.2	1.3	1.2	1.2
Fatal Accident	2.5	2.4	2.7	3.3	2.6	2.7	2.5
Nighttime Accident	0.6	0.5	0.5	0.4	0.5	0.6	0.6
Sunday Accident	1.4	1.2	1.0	1.2	1.0	1.3	1.1
"A" Injury Accident	2.3	2.4	1.6	1.7	1.7	1.7	1.2
No Injuries Accident	3.7	3.5	4.5	4.6	4.6	4.5	5.8
1972-74 Model Vehicle	2.4	2.1	1.9	1.4	2.0	1.7	2.0
Senior Citizen Driver	6.9	6.9	5.5	4.8	5.7	4.8	5.8
Truck Vehicle Type	12.8	13.0	12.3	13.6	12.2	13.6	11.7
Female Driver	3.6	3.8	4.1	3.6	4.2	3.4	4.6
"C" Injury to Vehicle Occ.	8.3	8.3	11.3	12.4	11.4	12.6	12.4
Motorcycle Vehicle Type	0.5	0.6	0.7	0.9	0.7	1.0	0.7
Average	5.16	5.11	4.93	5.39	4.95	5.35	4.89

Methods

A = 50,000 Population Minimum; 9 Density + Gas Sales Strata.
B = 85,000 Population Minimum; 7 Density + Gas Sales Strata.
C = 100,000 Population Minimum; 6 Density + Interstate Strata.
D = 200,000 Population Minimum; 6 Density + Interstate Strata.
E = $17 Mil. Gas Sales Minimum; 6 Density + Interstate Strata.
F = $34 Mil. Gas Sales Minimum; 6 Density + Interstate Strata.

TABLE 2.4.3. ROHs FOR 14 VARIABLES IN MICHIGAN 1973 5% SAMPLE OF TOWAWAY ACCIDENTS BY SIX DIFFERENT METHODS OF STRATIFICATION AND PSU CONSTRUCTION

	Method							
	%	A	B	C	D	E	F	G
Interstate Highway Accident	6.4	.0399	.0716	.0539	.0487	.0570	.0454	.0520
Single Vehicle Accident	47.3	.1323	.1003	.0813	.0967	.0794	.0966	.0638
Ped/Bicyclist Accident	0.5	.0021	.0015	.0022	.0014	.0022	.0012	.0016
Fatal Accident	1.7	.0134	.0101	.0116	.0137	.0111	.0102	.0106
Nighttime Accident	7.5	-.0037	-.0039	-.0033	-.0034	-.0033	-.0021	-.0030
Sunday Accident	14.0	.0040	.0015	.000015	.0012	-.00015	.0016	.0005
"A" Injury Accident	12.6	.0120	.0101	.0040	.0040	.0050	.0040	.0012
No Injuries Accident	45.0	.0252	.0185	.0244	.0216	.0250	.0208	.0334
1972-74 Model Vehicle	26.0	.0080	.0050	.0041	.0014	.0043	.0027	.0046
Senior Citizen Driver	6.1	.0342	.0270	.0197	.0147	.0210	.0147	.0214
Truck Vehicle Type	8.8	.0684	.0547	.0491	.0485	.0500	.0485	.0474
Female Driver	27.1	.0150	.0126	.0136	.0100	.0140	.0093	.0161
"C" Injury to a Vehicle Occupant	19.0	.0419	.0332	.0448	.0439	.0461	.0445	.0504
Motorcycle Vehicle Type	2.3	-.0027	-.0019	-.0013	-.0003	.0014	.00004	-.0011

Methods

A = 50,000 Population Minimum; 9 Density + Gas Sales Strata.
B = 85,000 population Minimum; 7 Density + Gas Sales Strata.
C = 100,000 Population Minimum; 6 Density + Interstate Strata.
D = 200,000 Population Minimum; 6 Density + Interstate Strata.
E = $17 Mil. Gas Sales Minimum; 6 Density + Interstate Strata.
F = $34 Mil. Gas Sales Minimum; 6 Density + Interstate Strata.

Another approach to analyzing the rates of homogeneity for key crashworthiness parameters involved a ridit comparison of data from three restraint study projects sponsored by NHTSA in 1974-75: Calspan's study in western New York, Southwest Research Institute's study in the San Antonio-Austin areas of Texas, and HSRI's study in Oakland and Washtenaw Counties, Michigan. The variable selected for comparison was the Abbreviated Injury Scale, and distributions on this scale were compared for just one category of accident severity, vehicles damaged at level three on the Vehicle Damage Index.

The results of six ridit comparisons are shown in Table 2.4.4. Only one of these six comparisons demonstrates a high degree of homogeneity in the AIS distributions, even though the analysis involves vehicles in just one VDI category. This is the comparison of the overall SwRI data with the overall Calspan data. However, when the two main components of the SwRI data, Bexar County (San Antonio) and Travis County (Austin), are compared their AIS distributions turn out to be quite dissimilar. Similarly, when the urban and rural components of the Calspan data are compared with each other the distributions are found to be quite dissimilar. The ridit comparisons of the overall HSRI data with the overall Calspan and SwRI data also demonstrate dissimilar distributions, as does the comparison of urban and rural data from Washtenaw County.

Thus it seems clear that fairly substantial heterogeneity in key variables of interest can be expected from different parts of the country and from areas of different population density. To take account of this expected heterogeneity it is recommended that at least 30 PSUs be included in the final NASS sample.

TABLE 2.4.4. RIDIT COMPARISON OF AIS DISTRIBUTIONS OF VDI CATEGORY 3 USING 1974-75 RESTRAINT STUDY DATA FROM CALSPAN, SwRI, AND HSRI

	N	Chance Equal	Chance Less	Chance Greater	Ridit	Odds Ratio	Significance Level	Standard Deviation
Michigan	680	.36	.29	.35	.53	1.13	.026	.027
Texas	932							
Michigan	680	.38	.28	.34	.53	1.12	.057	.031
New York	518							
New York	518	.36	.32	.32	.50	1.00	.939	.029
Texas	932							
Texas								
Bexar	502	.35	.28	.37	.54	1.19	.022	.037
Travis	359							
New York								
Urban	283	.37	.38	.25	.44	.78	.007	.047
Rural	234							
Washington								
Urban	92	.37	.39	.24	.43	.75	.029	.067
Rural	197							

2.5 Documentation of Formulas

The various sampling errors, design effects, and rohs discussed in Section 2.4 and in Section 3 were calculated by means of special programming using the Michigan Interactive Data Analysis System (MIDAS) computer program. The basic variance formula involved the calculation of three terms separately for each stratum and summing these to obtain the overall variance as follows:

$$\mathrm{Var}\left(\frac{y}{x}\right) = \frac{1}{x^2}[\overset{s}{\Sigma}\frac{(n)(\overset{n}{\Sigma}y^2)-(\overset{n}{\Sigma}y)^2}{n-1} + r^2\overset{s}{\Sigma}\frac{(n)(\overset{n}{\Sigma}x^2)-(\overset{n}{\Sigma}x)^2}{n-1}$$

$$- 2r\overset{s}{\Sigma}\frac{(n)(\overset{n}{\Sigma}y\cdot x)-(\overset{n}{\Sigma}y)(\overset{n}{\Sigma}x)}{n-1}$$

where:

r = the overall proportion on some characteristic.
y = the number of cases with this characteristic.
x = the total number of non-missing data cases.
n = the number of PSUs in a stratum
s = the number of strata.

The sampling error was calculated as two times the square root of the variance, thus utilizing a 95 percent level of confidence. The design effect was calculated as the ratio of the calculated variance to the variance which would be expected in a simple random sample design, that is:

$$\mathrm{Deff} = \frac{\mathrm{Var}\left(\frac{y}{x}\right)}{\frac{\left(\frac{y}{x}\right)\left(1-\frac{y}{x}\right)}{n-1}}$$

The rate of homogeneity (roh) is calculated as the ratio of Deff-1 to the average cluster size minus one. Thus:

$$\text{Roh} = \frac{\text{Deff}-1}{b-1}$$

where

b = the average number of non-missing data cases in a PSU,

that is:

$$b = \begin{array}{c} \underline{\;x\;} \\ S \\ \Sigma n \end{array}$$

3. REVISED PRIMARY SAMPLING UNITS FOR NASS

As mentioned in the Introduction, a major task of this revision of the NASS plan involved the development of the two new sets of potential Primary Sampling Units (PSUs) from which the final accident investigation sites could be chosen when NASS is implemented. In the original NASS plan the PSUs were constructed from whole counties (or towns in five New England states) in such a way that the minimum PSU population was 50,000 people. There is concern that a PSU of this minimum size would be likely to generate only a small number of severe accidents of the types of greatest interest to highway safety researchers, and that therefore the work of the accident investigation team in such a PSU would not be as efficient and productive as it would be in a larger PSU with a larger number of serious accidents. Accordingly, HSRI was asked to develop two new sets of potential PSUs for the contiguous United States, using two larger minimum size criteria. NHTSA also suggested the use of some different stratification criteria in the development of these plans and requested that the probabilities of selection for each stratum within each plan be determined for seven different numbers of total selected PSUs: 10, 15, 20, 25, 30, 35, and 40.

The following sections of this report will briefly describe the PSU construction and selection procedures used in the 1975 NASS design; the revised procedures suggested by NHTSA; the actual procedures carried out in constructing the revised sets of PSUs; and the probabilities of selection for each stratum for each of the seven total PSU sizes for each of the two basic plans. Appendices provide the lists of PSUs by stratum with cumulative populations within each stratum; lists of the county/town components of each potential PSU; and 14 sets of output from the Groves-Hess Controlled Selection Computer program showing the weighted possible patterns of PSU selection among the strata of each plan.

3.1 Summary of 1975 NASS PSU Formation and Selection Methods

A. Each county was classified into one of three density types:

1) Central county of an SMSA (OMB 1974 definitions), including any SMSA county containing a city over 50,000 in population in which the city's name is part of the SMSA name.

2) Suburban county of an SMSA (any SMSA county not fitting the first category).

3) Non-SMSA county of any size (the largest had 260,000 people).

B. Counties under 50,000 in population were grouped with other counties to form multi-county PSUs of a minimum 50,000 population. The criteria used for grouping were:

1) State boundaries were not to be crossed. This was for the practical reason that cooperation of state police authorities will be essential to the work of the accident investigation team in every PSU, and it seems desirable whenever possible to only have to obtain this cooperation from one set of state police authorities per selected PSU. This criterion was violated only in the case of three California counties on the eastern slopes of the Sierras being combined with other non-SMSA counties in Nevada.

2) Counties were combined with other counties of the same density types as much as possible. However, for 52 of the 744 multi-county PSUs this criterion proved impractical, mainly cases of small suburban SMSA counties which were grouped with central SMSA counties. In retrospect it seems that probably even more PSUs should have deviated from this criterion, for some rather awkwardly shaped PSUs were formed in order to comply with this criterion.

3) The multi-county PSU was to be as compact, coherent, and logistically accessible as possible. The ideal multi-county PSU was considered to include a central county with a small population center plus one or more adjacent counties whose residents tended to look to that center for their distribution needs, all of which were interconnected by adequate roads. The Rand McNally map of 494 Basic Trading Areas was somewhat useful in this grouping process.

C. Most counties over 50,000 in population were treated as single self-contained PSUs.

D. It was decided to recommend a total sample size of 35 PSUs. This permitted designating the three largest PSUs -- New York City, Los Angeles County, and Cook County -- as self-representing PSUs, and these three PSUs were selected for the NASS sample with certainty.

E. The remaining 1,238 non-self-representing PSUs were each assigned to one of 48 strata formed as follows:

1) Entire states were assigned to one of four major geographic regions (Northeast, Midwest, South, West). These were defined to make them as equal in population as possible, excluding the three self-representing PSUs from the state population totals in those three states.

2) Each of these four major strata were then divided into three density type substrata: central SMSA PSUs, suburban SMSA PSUs, and non-SMSA PSUs. PSUs containing counties of more than one density type were assigned to the substratum whose type was predominant in that PSU.

3) The PSUs in each of these 12 substrata were then further divided into four subsubstrata based on 1972 per capita retail gasoline service station sales. Quintile rankings were calculated using all 1,241 PSUs, and the same dividing points were applied in all substrata using the first, second, and third quintile points (thus combining the fourth and fifth quintiles).

F. The 1,238 PSUs were ranked within each subsubstratum in relation to number of counties in the PSU and total PSU population (i.e., first all single-county PSUs were ranked from largest to smallest, then all two-county PSUs were ranked from largest to smallest, etc.). Cumulative populations within each subsubstratum were then calculated for each PSU in order to permit a random number process to be utilized in the selection of PSUs in proportion to their population size.

G. It was decided that there should be exactly eight PSUs selected from each of the four major strata. The rationale for this was to ensure that the pairings of the selected PSUs for the calculation of sampling errors would not involve crossing any regional lines. It was expected to be rare for two PSUs to be selected from the same subsubstratum (thus providing a natural pairing), but it was considered desirable to keep these pairings within the boundaries of the four major strata, the regions.

H. The total population in each subsubstratum was multiplied by eight and then divided by the total regional population to determine the probability estimate for the number of PSUs to be selected from that subsubstratum. These probabilities for all 48 subsubstrata were placed in a matrix in the computer, and the Groves-Hess CONSEL (controlled selection) program was used to determine the actual numbers of PSUs to be selected randomly from each subsubstratum. This program produced a weighted list of possible patterns of PSU selection for each subsubstrata, and one of these patterns was chosen by means of a random number table and the cumulative pattern weights.

I. Within each regional stratum the four most natural pairings of the eight subsubstrata selections based on the chosen pattern were determined for use in future sampling error calculations.

3.2 NHTSA Suggestions for Revising the PSU Formation and Selection Methods

A. Each county should be classified into one of nine density strata:

1) County within a large SMSA and consisting primarily of dense central cities of that SMSA.
2) County within a large SMSA and consisting primarily of suburbs.
3) County within a large SMSA and blending dense central cities with suburbs.
4) Counties within a small SMSA.
5) Non-SMSA counties adjacent to a very large SMSA.
6) Non-SMSA counties containing a vital Interstate Highway.
7) Non-SMSA county with dense rural population.
8) Non-SMSA county with sparse rural population and flat terrain.
9) Non-SMSA county with sparse rural population and mountainous terrain.

B. Each county should also be classified into one of three climatic strata:

1) Dry.
2) Moist, with little snowfall.
3) Moist, with much snowfall.

C. Two sets of PSUs should be formed, one using $16,800,000 in 1972 retail gasoline service station sales as a minimum PSU size criterion, and the other using $33,600,000 as a minimum PSU size criterion. When counties need to be grouped together to meet these minimum size criteria, counties from the same strata types (A and B above) should be combined as much as possible.

D. Each PSU formed should be assigned to one of the 27 strata; the total strata gasoline sales figures should be calculated; the self-representing PSUs should be determined; and the numbers of non-self-representing PSUs to be selected from each stratum should be ascertained using the Groves-Hess CONSEL program for seven different total sample sizes: 10 PSUs, 15 PSUs, 20 PSUs, 25 PSUs, 30 PSUs, 35 PSUs, and 40 PSUs.

3.2.1. Comments on the Density Strata.

These are an elaboration on the three density types used in the original report, with the addition of two new criteria--"vital Interstate Highways" and flat versus mountainous terrain. However, not one of these nine types in the RFQ is defined clearly and this leads to problems in implementation. For example, Group 1 does not seem very distinct from Group 3. Almost all large SMSA central counties are a blending of central city and suburbs. The only exceptions are Boston, New York City, Philadelphia, Baltimore, Washington, St. Louis, and San Francisco. These exceptions do not seem sufficient to compose a distinct stratum.

Among the non-SMSA strata Groups 5 and 7 do not seem very useful. The OMB has already defined SMSAs rather broadly to include many rather exurban areas. For example, the Washington SMSA already includes Loudon and Prince William Counties in Virginia. Using Group 5 would involve separating Clark, Fauquier, and Stafford counties from other non-SMSA counties in Virginia, and this doesn't seem to be a useful distinction. In regard to Group 7 it might be useful to distinguish densely populated and sparsely populated non-SMSA counties on some arbitrary people-per-square-mile criterion. However, unless such counties happen to meet the minimum size criterion alone, then one faces the practical problem of finding another similar county to combine it with in forming PSUs within stratum types. Often there will be no similar Group 7 county adjacent, so it will have to be combined with adjacent sparsely populated counties and the strata distinctions will lose their meaning. There are only 42 non-SMSA counties with 1970 populations over 100,000, hardly a large enough group to form a distinct stratum if that definition were applied.

Groups 6, 8, and 9 face the problem that they are much more difficult to define objectively. The intent of Group 6 seems to be distinguish non-SMSA counties which have a lot of transient traffic from those which do not. But without obtaining traffic count data from each state highway department it is difficult to apply any objective criterion for making this distinction. And one wonders if only interstate highways should be taken into account. Interstate highways tend to generate a lot fewer accidents per mile driven than two-lane highways, and in Michigan the highest accident rates per capita are found in northern rural counties with two-lane highways going through them. But trying to bring in such aspects would complicate the definitional problem even more.

And for Groups 8 and 9 how is "mountainous" to be defined? Clearly there are some counties in the Cascades, Rockies, and Sierras which most people would define as mainly mountainous. But even here how would you classify Shasta County, California, which contains 10,000 foot Mt. Lassen, etc., but where most of the people live in the broad Sacramento Valley (flat). Also generally such really mountainous counties are so sparsely populated that it would be impossible to form viable PSUs within this stratum. On the other hand, if a broader definition is used it is hard to determine where mountainous turns into flat. Most of the Northeast, southern Ohio and Indiana, western Virginia and North Carolina, eastern Kentucky and Tennessee, parts of Georgia and Alabama, etc., are at least quite hilly. There is a good topographic land-form map available in The National Atlas (but the lines do not follow county boundaries of course), and it would be possible to try to implement this distinction between fairly hilly and not so hilly. However, it would greatly complicate the task of multi-county PSU formation.

3.2.2. Comments on the Climatic Strata. These three categories are rather more easy to define and to apply to each county. Using the definition of moist versus dry as more or less than 28 inches of precipitation each year and the definition of snowy as more than 16 inches of snow each year, the contiguous United States may be divided into three major regions plus one minor region (Dry West, Snowy North, Moist South, Moist Pacific Northwest). This definition of "moist" as more than 28 inches has the geographic advantage that it provides a fairly smooth north-south line with almost no pockets of deviation on either side. Of course there are places in the Rockies and Sierras which get more than this amount of precipitation, but they rarely embrace whole counties, let alone a string of counties which could form a viable PSU meeting the minimum size criterion.

It should be noted that these climatic divisions result in almost half the population being placed in the snowy stratum, with about 30 percent in the moist stratum, with about 19 percent in the dry stratum, and with 2.3 percent in a wet Pacific Northwest region which might be treated as a separate stratum from the Southeast wet stratum. Such a fourth stratum would have an 80 percent chance of having one PSU selected from it in a 35-PSU system.

While this climatic stratification system is fairly easy to define and apply to the individual counties (although of course the actual lines do not follow county boundaries exactly and must be moved slightly to apply to counties), it does create problems with the formation of multi-county PSUs. If one considers it important to avoid crossing state boundaries in the formation of PSUs, then these climatic stratification lines add additional constraints on the PSU formation process in the 21 states which are not wholly within one climatic stratum. In general there seems to be no particular advantage to using these broad climatic regions as compared to the major geographic regions used in the original report, and they do have a disadvantage to the PSU formation process in a number of states.

3.2.3 Comments on the Minimum Size Criterion. Although NHTSA suggests grouping counties into minimum size PSUs on the basis of 1972 retail gasoline sales, it is recommended that the Census Bureau 1974 estimated county populations be used instead. As shown in Table 3.2.1, county correlations calculated in five states tend to be higher between accidents and population than between accidents and gasoline sales. Also gas sales data are not published for a number of small counties and New England towns and would have to be estimated for these areas. Thus population rather than gasoline sales seems a more appropriate basis for grouping counties into PSUs.*

In accordance with the NHTSA request two national sets of minimum size PSUs have been formed, one based on a minimum population size of 100,000 and the other based on a minimum population size of 200,000. Table 3.2.2 shows the numbers of multi-county PSUs which have been formed using these minimum-size criteria and also the estimated number which would be formed using a 300,000 population minimum-size criterion. Under the 200,000 minimum-size criterion it is expected that about 46 percent of the PSUs will be chosen from among 413 multi-county

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*While there are some comparisons in Table 3.2.1 in which the gas sales correlations are slightly higher, it is clear that in general there should be no disadvantage to using population as the basic measure of size.

TABLE 3.3.1. SOME COMPARISON CORRELATIONS OF 1973 ACCIDENTS BY COUNTY WITH 1972 RETAIL GAS SALES AND WITH 1970 POPULATION IN FIVE STATES

	All Accidents	Injury Accidents
Michigan N=83		
Gas Sales	.9971	.9937
Population	.9969	.9953
Michigan-5 Largest N=78		
Gas Sales	.9831	.9721
Population	.9867	.9895
Texas N=254		
Gas Sales	.9935	.9887
Population	.9936	.9939
Texas-5 Largest N=249		
Gas Sales	.9286	.9391
Population	.9422	.9524
Colorado N=63		
Gas Sales	.9906	.9947
Population	.9818	.9929
Colorado-Denver N=62		
Gas Sales	.9925	.9865
Population	.9959	.9853
South Carolina N=46		
Gas Sales	.9683	.9235
Population	.9910	.9678
Michigan, Texas, Colorado, South Carolina, New Jersey N=467		
Gas Sales	.9840	.9848
Population	.9801	.9889
Same Minus New Jersey and 11 Largest N=435		
Gas Sales	.9506	.9200
Population	.9654	.9298

TABLE 3.2.2. TYPES OF PSUs CREATED WITH MINIMUM 100,000 AND 200,000 PSU SIZES AND ESTIMATED TYPES OF PSUs WITH A 300,000 MINIMUM PSU SIZE

	Minimum PSU Size		
	100,000	200,000	300,000
Total PSUs	936	604	449
Mean Number of Counties	3.3	5.2	6.9
Median Number of Counties	1.8	2.9	4.2
Multi-County PSUs	592	413	333
Mean Number of Counties	4.7	7.1	9.0
Median Number of Counties	3.4	6.1	7.4
Population % in Multi-County PSUs	35.4%	45.8%	51.2%
Number of PSUs with Five or More Counties	226	244	---
Percent of Population in PSUs with Five or More Counties	11%	24%	---
Number of PSUs with Ten or More Counties	41	103	---
Percent of Population in PSUs with Ten or More Counties	2%	10%	---
Largest Number of Counties in a PSU	24	33	---
Estimated Annual Number of Fatal Accidents in 35 PSUs*	1336	1685	1946

*Assuming PSUs over 300,000 in size are reduced to Secondary Selection Units of 300,000 in size.

PSUs averaging 7.1 counties per PSU. About ten percent of the PSUs would be selected from PSUs containing ten or more counties. Using this minimum size would clearly lead to selection of some extremely large and unwiedly PSUs. To use a minimum population size of 300,000 would obviously lead to even more selections of very large-in-area PUSs. In Plan 1 the PSU containing the largest number of counties is one formed in central South Dakota with 24 counties. In Plan 2 the PSU containing the largest number of counties is one formed in western Nebraska with 33 counties.

Also shown in Table 3.2.2 are estimates of the numbers of fatal accidents which would be included in a 35 PSU sample at these three minimum-size levels, assuming that PSUs larger than 300,000 were reduced to Secondary Selection Units of about 300,000 people. These estimates are included because obtaining sufficient numbers of fatal and severe accidents for detailed analysis is one of the major goals of the NASS program. It is apparent that the larger the minimum population size criterion used in the PSU formation process, the larger the number of fatal accidents that would be available for investigation in the selected PSUs. However, also larger would be the number of selected PSUs which would cover large geographic areas and provide serious logistical problems for the resident accident investigation teams.

3.3 Determination of the Most Appropriate Stratification Procedures

Stratification of the potential PSUs before selection has as its major purpose an increase in the reliability of the national statistics generated by the accident investigation program. If there are substantial differences in frequencies, types, degrees of severity, etc., of accidents in different types of geographic areas, it is statistically useful to divide the PSUs into geographic strata which are as homogeneous as possible internally but which maximize between-strata heterogeneity, and then to select PSUs within each stratum proportionately in relation to the ratio of the stratum's population to the total population. This procedure should lead to a reduction in the sampling errors in data collected from the stratified sample as compared with data collected from an unstratified sample. Of course, if all geographic areas were homogeneous in regard to accident characteristics, there would be no statistical value to geographic stratification and the sample areas could be chosen on other bases such as convenience, public relations, expected cost of accident investigation team operation, etc.

However, all the evidence in state published reports and in HSRI accident files suggests that there is substantial variation in accident frequencies and characteristics among various geographic areas. For example, a look at 1971 published injury accident rates per 1,000 population in 14 states shows a variation from 4.7 in South Carolina and 5.2 in Georgia to 11.8 in Arizona and 12.0 in New York. Similarly, 1974 fatal motor vehicle traffic death rates per 100,000 population ranged from 10.5 in Rhode Island to 54.3 in Wyoming. Some of the differences in injury accident rates may result from differences in state accident reporting practices, but there can be no doubt that the differences in fatal accident rates reflect true differences. Given the small populations of many counties plus further variations in local police reporting practices, it is not surprising to find even larger differences in accident rates in comparisons among the counties of the United States.

The problem, then, is to find stratification variables other than the published accident rates themselves which tend to reflect the real heterogeneity which is known to exist and which at the same time are practically suitable for the grouping of small counties into cohesive PSUs each belonging to a single stratum. It is also desirable from a public relations point of view that the stratification procedures be chosen so as to encourage the selection of PSUs in many different states spread throughout the country. Whether or not there are genuine inter-regional differences in accident frequencies and types, it is important that a selected sample of PSUs appear representative of the whole nation. Even if there were good statistical evidence that a multi-stratified sample of PSUs which happened to be concentrated in a few states was more representative of the significant differences in accident types in the United States than a more broadly distributed sample using only a few stratification types, there would likely be a lingering doubt among many readers about the "national" results reported from the first sample.

Thus the stratification variables to be utilized should be chosen not only to maximize reduction in variance but also to maximize the appearance of national representativeness in the selected sample of PSUs. One way to do this more effectively than by using the four major regions of the 1975 NASS report or the 3-4 climatic regions suggested by NHTSA would be to use the nine minor regional divisions of the Census Bureau as primary strata.

3.3.1 Analysis of Potential Secondary Stratification Variables. The original NASS report made use of three types of stratification variables: region (four categories), urbanicity (three categories), and retail gasoline sales (four categories). The RFQ suggests an expanded urbanicity variable with six categories, a climatic variable with three categories, a topographic variable with two categories, and a one category interstate highway variable. In order to try to determine which of these variables would be expected to be most effective in reducing sampling errors in data collected from a national sample, two types of Michigan data were analyzed: published county totals of fatal, injury, and all accidents, and a five percent sample of all 1973 Michigan police-reported accidents maintained in the HSRI computer files. From this sample only accidents involving a towed vehicle were analyzed, since that is the expected major criterion for accident selection in the NASS program.

In order to analyze the effects of different grouping and stratification methods three different PSU groupings were made of Michigan counties, each grouping the counties into potential PSUs of approximately 100,000 minimum population. Method B grouped the counties into the three urbanicity categories of the original NASS report: central SMSA, suburban SMSA, and non-SMSA. Method G also involved forming the PSUs in these three basic types, but the actual PSUs formed were slightly different from those in Method B. Method C tried to apply the more complex grouping procedures of the nine NHTSA density strata, but of course Michigan lacks variation on the climatic and topographic variables, so these could not be used. The six categories used for PSU grouping in Method C were: central SMSA counties over 200,000; suburban SMSA counties over 200,000; central SMSA counties under 200,000;

predominantly suburban counties under 200,000; non-SMSA counties containing major interstate highways; and other non-SMSA counties.

The first procedure utilized in trying to determine the optimal geographic stratification variables was a cluster analysis program. 1971 county per capita injury accident rates, and percentages of county towaway accidents in the 1973 five percent sample which involved four severity types, were analyzed by the cluster program to see if there were any natural groupings of counties with similar accident experience. This procedure failed to indicate any clear-cut cluster types among Michigan counties. There was some tendency for more urban areas to cluster together, but with both data sets some urban counties fell into largely rural clusters and vice versa. After the Methods B and C PSUs were formed the cluster analysis program was also applied to the five percent sample data aggregated into these potential PSUs to see if there were any natural groupings of PSUs. This resulted in a little more consistency in clustering along an urbanicity dimension, but again no clearcut urbanicity categories were apparent. Nor did there seem to be any evidence of clustering of PSUs by similar per capita gasoline sales in Method B PSUs or by the presence of interstate highways in Method C PSUs.

The next procedure utilized was to calculate the sampling errors for 14 accident variables using the five percent sample data, making use of each of the three PSU groupings and various types of stratification of the PSUs in order to ascertain which methods would result in the greatest reduction in sampling error. In Method B different combinations of the urbanicity and gas sales variables were tested; in Method C different combinations of the urbanicity and interstate highway variables were tested; and in Method G different combinations of the urbanicity, density, and gas sales variables were tested. These sample error results are shown in Table 3.3.1.

As would be expected, the sets of sampling errors calculated without stratification were very similar for all three grouping methods, and except for small reductions on the single vehicle accident variable there were almost no changes under any of the methods when the PSUs were stratified on the three basic urbanicity types. For each method the rural stratum was then divided into two strata to see if this might produce a reduction in sampling error. For Method B this involved the formation of an average gas sales rural stratum and a high gas sales rural stratum, but the sampling error results of introducing this variable proved to be negligible. For Method C this involved the division of the rural PSUs into two strata, one containing PSUs with multi-lane limited access highways, and one containing PSUs without such highways. However, again the introduction of this variable had scarcely any effect on the set of sampling errors. For Method G the rural stratum was divided into two density strata, one composed of all PSUs containing 1-3 counties plus PSUs containing more counties but with at least half the PSU population in one county, the other stratum containing the remaining rural PSUs. This variable also had virtually no effect on the set of sampling errors.

In fact the only stratification procedure which showed a large effect on the sampling errors was that used in Methods C and G to produce five strata: large urban, large suburban, small urban, small suburban, and rural. These were defined slightly differently in the two methods, with the four Michigan counties between 200,000 and 300,000 in population being assigned to the large urban category

TABLE [illegible]1. CALCULA[illegible] SAM[illegible] G E[illegible] F[illegible] VA[illegible]LES 197[illegible] [illegible]HIO [illegible]PE[illegible] F S[illegible] DAT[illegible]
FOR DIFFERENT METHODS OF PSU FORMATION AND DIFFERENT TYPES OF STRATIFICATION

		Method B				Method C					Method G					
	Prop. %	No. Strata	3a Strata	4c Strata	7d Strata	No Strata	3a Strata	4c Strata	5b Strata	6f Strata	No Strata	3a Strata	4g Strata	5b Strata	6h Strata	7i Strata
1. I-S Highway Accident	6.4	2.11	2.14	2.14	2.35	2.16	2.16	2.11	2.21	2.16	2.14	2.16	2.17	2.10	2.11	2.07
2. Single Vehicle Accident	47.3	6.39	5.94	5.94	5.60	6.50	6.02	6.03	5.09	5.10	6.46	6.02	6.01	4.61	4.60	4.61
3. Ped./Bic. Accident	0.5	.20	.21	.21	.22	.21	.21	.21	.23	.23	.21	.21	.21	.22	.22	.22
4. Fatal Accident	1.7	.64	.65	.65	.57	.63	.64	.64	.60	.60	.63	.64	.64	.59	.59	.59
5. Nighttime Accident	7.5	.60	.60	.57	.52	.54	.53	.54	.54	.55	.57	.58	.58	.59	.59	.58
6. Sunday Accident	14.0	1.12	1.07	1.07	1.11	1.14	1.08	1.08	.99	1.00	1.15	1.11	1.12	1.04	1.05	1.05
7. "A" Injury Accident	12.6	1.24	1.27	1.28	1.49	1.23	1.26	1.23	1.29	1.26	1.23	1.26	1.25	1.03	1.02	1.05
8. No Injury Accident	45.0	3.16	3.18	3.18	2.73	3.20	3.19	3.14	3.13	3.08	3.20	3.22	3.18	3.45	3.42	3.47
9. 1972-74 Vehicle	26.0	1.51	1.53	1.53	1.47	1.53	1.52	1.-4	1.40	1.41	1.54	1.57	1.56	1.47	1.47	1.45
10. Senior Citizen Driver	6.1	1.36	1.37	1.38	1.45	1.35	1.35	1.35	1.32	1.32	1.36	1.37	1.37	1.33	1.34	1.34
11. Truck Vehicle	8.8	2.35	2.31	2.31	2.36	2.37	2.32	2.33	2.29	2.29	2.36	2.31	2.31	2.23	2.23	2.24
12. Female Driver	27.1	2.01	2.08	2.08	1.99	1.96	2.02	2.03	2.08	2.08	1.95	2.01	2.01	2.21	2.22	2.21
13. "C" Injury in Vehicle	19.0	3.07	3.05	3.05	2.61	3.08	3.05	3.05	3.06	3.06	3.08	3.07	3.07	3.20	3.20	3.19
14. Motorcycle Vehicle	2.3	.31	.30	.30	.26	.29	.28	.28	.30	.29	.29	.28	.28	.30	.30	.30

a = Urban, suburban, rural.
b = Large urban, small urban, large suburban, small suburban, rural.
c = Urban, suburban, average gas rural, high gas rural.
d = Moderate gas urban, average gas urban, high gas urban, moderate gas suburban, average gas suburban, average gas rural, high gas rural.
e = Urban, suburban, interstate rural, non-interstate rural.
f = Large urban, small urban, large suburban, small suburban, interstate rural, non-interstate rural.
g = Urban, suburban, large rural, small rural.
h = Large urban, small urban, large suburban, small suburban, large rural, small rural.
i = Large urban, small urban, large suburban, small suburban, moderate gas rural, average gas rural, high gas rural.

in Method C and to the small urban category in Method G. The Method C 5-strata procedure resulted in at least a 15 percent reduction in sampling error for two variables, single-vehicle accidents and Sunday accidents, with lesser change in both directions on the other variables. The Method G 5-strata procedure resulted in a 29 percent reduction in sampling error for the single vehicle accident variable and a 16 percent reduction in sampling error for the important severity indicator, "A" injury in the accident, while there were lesser changes in both directions on the other variables.

When the rural stratum in the five Method C strata was divided into two strata on the basis of the presence or not of limited access highways, this resulted in little further change in the set of sampling errors. Similarly when the rural stratum in the five Method G strata was divided into two density strata and into three gas sales strata, there was almost no change in the resulting sampling errors. However, when the urban and suburban strata in the four Method B strata were divided into three and two gas sales strata, respectively, this 7-level stratification did result in some significant changes in sampling errors for a number of variables, including a 20 percent <u>increase</u> on the key variable concerning "A" injury accidents but also including substantial decreases on some variables. These are the urbanicity-gas sales strata which were actually applied in developing the 1975 NASS design.

It seems apparent from these calculations that there is no single geographic stratification procedure which can be expected to have a uniformly beneficial effect on the sampling errors of all accident variables of interest. The most effective stratification type seems to be the Method G 5-stratification procedure, since this method results in the greatest reduction in sampling error for two important variables, single vehicle accidents and "A" injury accidents, without greatly increasing the sampling errors for any of the other variables analyzed. These sampling error calculations do not provide any justification for going to the trouble of further stratification of rural PSUs on the basis of density, or of presence or not of interstate highways, or of per capita gasoline sales.

However, it must be remembered that the Table 3.3.1 sampling errors were derived from a sample of five percent of Michigan accidents with as few as 49 towed vehicles in the smallest PSU and as few as 361 towed vehicles in the smallest stratum, so there is some question concerning the reliability of these data aggregated at the PSU level and even at the stratum level. Also these data can only indicate the degree of heterogeneity in the types of accidents reported to the police in these PSUs and strata; they do not provide any information about the degree of heterogeneity in per capita rates of different types of accidents in different PSUs and strata.

Table 3.3.2 presents comparisons of per-1,000-population rates for six accident variables, three from the five percent sample and three from published county data. The most striking differences in Table 3.3.2 concern the well-known tendency for fatality rates to be higher in rural than in urban areas. However, this trend is slightly reversed when the rates for all injury accidents are compared, even though rural areas do have slightly higher overall accident rates than do urban areas. Also significant are the considerably higher rates of serious injury accidents and of single vehicle accidents in rural areas compared to suburban and urban areas. But when suburban and urban areas are split into small and

TABLE 3.3.2. SOME MICHIGAN ACCIDENT RATES PER THOUSAND POPULATION, FROM THE MICHIGAN 1973 FIVE PERCENT SAMPLE AND FROM THE 1971 MICHIGAN TRAFFIC ACCIDENT FACTS

Stratum	County N	1973 Towed Vehicles	1973 Fatal or "A" Level Worst Injury in Towed Vehicle	1973 Towed Vehicles in Single Traffic Unit Accidents	1971 All Accidents	1971 All Injury Accidents	1971 All Fatal Accidents
Michigan	83	16.9	1.86	5.0	35.4	11.3	.213
Central SMSA Counties	11	16.7	1.71	4.2	36.3	11.9	.172
Suburban SMSA Counties	14	17.3	1.95	4.9	31.4	10.7	.219
Non-SMSA Counties	58	16.7	2.24	8.1	38.5	10.4	.337
Method G Large Urban	3	15.7	1.35	3.4	35.3	12.3	.150
Method G Small Urban	8	19.1	2.56	5.9	38.8	11.0	.224
Method G Large Suburban	2	17.1	1.59	3.6	30.9	10.9	.164
Method G Small Suburban	12	17.8	2.55	7.6	32.2	10.2	.316
Method G Dense Rural	16	18.4	2.01	7.7	36.1	10.0	.370
Method G Sparse Rural	42	14.9	2.54	8.2	41.3	10.9	.313
Method G Moderate Gas Sales Rural	18	15.0	2.49	7.7	34.7	9.8	.326
Method G Average Gas Sales Rural	17	16.4	2.16	7.7	38.5	9.9	.358
Method G High Gas Sales Rural	23	18.4	2.17	8.5	42.5	11.5	.343
Method C I-S Highway Rural	15	18.8	1.88	8.8	39.9	11.2	.353
Method C Non-I-S Highway Rural	42	15.8	2.44	7.6	38.2	10.1	.335

large strata according to the Method G stratification plan, the heterogeneity within central and suburban SMSA areas becomes strikingly apparent. This provides further justification for the use of the four types of SMSA strata under Method G.

The bottom seven rows of Table 3.3.2 provide comparisons of accident rates for three different methods of stratifying the rural areas of Michigan: in relation to density, per capita gas sales, and presence of limited access highways. Each of these methods does result in some differences in the accident rates, although there is undoubtedly an increased problem of unreliability for the rates based on the five percent sample for these smaller divisions of the state. There is also considerable overlap among the dense, limited access highway, and high gas sales strata which confounds somewhat the choice of the most effective variable. Looking at the three types of divisions in Table 3.3.2, one finds that the dense stratum is higher on only two of the six comparisons; the high gas sales stratum is highest on four of the six comparisons and second on two; and the limited access highway stratum is higher on five of the six comparisons. This suggests that there might be value in using the limited access highway variable to create two types of rural strata with different accident rate levels to ensure that both types of areas are represented appropriately in the national sample. However, as previously discussed, there are practical problems in applying this variable both in the subjectivity involved in determining "vital" limited access highways and in the awkward PSU shapes that result from trying to group counties into PSUs in relation to the presence or absence of such highways. Table 3.3.3 does show, as had been assumed in the 1975 NASS report, that there are substantially higher rates for all accidents, injury accidents, and towed vehicles in areas with high gas sales per capita than in areas with average and moderate gas sales per capita. Assuming that the higher accident rates in these areas do reflect higher levels of road traffic which in turn are indicated by higher per capita gasoline sales, this variable does seem to provide, as expected, a means for distinguishing among rural areas with and without considerable transient traffic and thus provides an objective quantifiable means of proportionately representing these areas in the national sample.

3.3.2 Chosen Stratification Procedures. On the basis of the foregoing analysis and discussion, it was decided to use the following types of strata in the revised PSU formation and selection plans.

A. Census Bureau Minor Regions

1) New England (Conn., Maine, Mass. N.H., R.I., Vt.)
2) Middle Atlantic (N.J., N.Y., Pa.)
3) East North Central (Ill., Ind., MI., Ohio, Wis.)
4) West North Central (Iowa, Kan., Minn., Mo., Neb., N.D., S.D.)
5) South Atlantic (Del., D.C., Fla., Ga., Md., N.C., S.C., Va., W.Va.)
6) East South Central (Ala., Ken., Miss., Tenn.)
7) West South Central (Ark., La., Okla., Tex.)
8) Mountain (Ariz., Colo., Idaho, Mont., Nev., N.M., Utah, Wy.)
9) Pacific (Calif., Ore., Wash.)

B. Urbanicity* and Gas Sales Strata

1) Large Central SMSA PSUs: containing a central SMSA county with at least 300,000 people.
2) Small Central SMSA PSUs: containing a central SMSA county with less than 300,000 people.
3) Large Suburban SMSA PSUs: containing a suburban SMSA county with at least 200,000 people.
4) Small Suburban SMSA PSUs: containing sufficient SMSA suburban counties to compose at least 40 percent of the PSU population.
5) Non-SMSA PSUs: containing less than 40 percent of the PSU population in suburban SMSA counties. These non-SMSA PSUs are further stratified on retail gas sales as follows:
    a) Low Transient Non-SMSA PSUs: in lowest third of non-SMSA PSUs on per capita retail gasoline sales.
    b) Average Transient Non-SMSA PSUs: in middle third of non-SMSA PSUs on per capita retail gasoline sales.
    c) High Transient Non-SMSA PSUs: in highest third of Non-SMSA PSUs on per capita retail gasoline sales.

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*A central SMSA county is defined as the SMSA county containing the first city in the SMSA name (as determined by the Office of Management and Budget), or any other county in an SMSA which contains a city of at least 50,000 population which city is included in the SMSA name. For example, both Denver and Boulder Counties are considered "central" counties from the Denver-Boulder SMSA. All other counties defined by the Office of Management and Budget as components of SMSAs as of December, 1975 are considered to be "suburban" SMSA counties.

3.4 Procedures Used in Forming the Two Revised Sets of PSUs

The task of forming the two new sets of potential PSUs, one with a minimum size of 100,000 people (Plan 1) and the other with a minumum size of 200,000 people (Plan 2), was necessarily a laborious and time-consuming assignment. The steps in this process may be summarized as follows:

A. Two sets of state maps were xeroxed which showed SMSA boundaries as of 1970.

B. The SMSA boundary definitions were updated on the maps according to the December 1975 definitions of the Office of Management and Budget listed in Federal Processing Standards Publication 8-4 (June, 1974) and Current Population Reports, Series P25, No. 618 (January, 1976).

C. The county populations were entered on these maps in thousands.

D. On the two maps for each state the Plan 1 and Plan 2 PSUs were marked off, grouping counties as necessary to meet the Plan 1 and Plan 2 minimum size requirements. As much as seemed practical, multi-county PSUs were formed from counties of the same urbanicity type. However, creating PSUs which were compact and logically coherent was considered a more important criterion than similarity of urbanicity type, so many small SMSA central and suburban counties were grouped together and/or with rural counties in order to meet the minimum size requirements while maintaining contiguity and as much logistical viability as possible in the grouped counties. State boundaries were crossed in the formation of only ten of the 1,540 PSUs created in the two plans. In both Plans 1 and 2 the eastern slopes of the Sierras in central California were combined with rural areas of Nevada; some counties of southern Idaho and northern Utah were combined; the northeastern panhandle area of West Virginia was combined with some counties in northern Virginia; and

Virginia's eastern shore of Chesapeake Bay was combined with Maryland eastern shore counties. In addition, in Plan 2 two counties in eastern Maryland were combined with the two rural Delaware counties, and western Wyoming was combined with northeastern Utah. In three New England states, Connecticut, Massachusetts, and Rhode Island, where SMSAs do not consist of whole counties, most of the PSUs were formed as groups of towns rather than entire counties. In general small SMSAs were treated as single PSUs, while each county part of larger SMSAs was treated as a separate PSU. The total number of Plan 1 PSUs formed was 936, and the total number of Plan 2 PSUs formed was 604. Some further information on the characteristics of these two sets of PSUs was shown in Table 3.2.

E. A unique 4-digit identification number was assigned to each PSU, and a computer card was keypunched for each PSU which contained the PSU name, identification number, region code, urbanicity code, and the number of counties in the PSU.

F. A computer card was keypunched for each county in the contiguous United States (or other PSU component in the three New England states) which contained the county name, county identification number, its Plan 1 PSU identification number, its Plan 2 PSU identification number, its estimated 1974 population from Current Population Reports, Series P-25, No. 620 (February, 1976), and its 1972 retail gasoline service station sales as published in Table 6 of the series of state reports on the 1972 Census of Retail Trade. In the three New England states 1973 population estimates were used as published in General Revenue Sharing: Initial Data Elements, Entitlement Period Six (April, 1975) because the Census Bureau has not made 1974 population estimates for parts of counties. The total population of these three states is estimated by the Census

Bureau to have decreased 0.2 percent from 1973 to 1974, so only a very slight bias in favor of the selection of PSUs in these states has been introduced by the use of 1973 population figures there. In 70 sparsely populated counties no retail gasoline sales total was published. In these counties and in many of the smaller New England towns the gasoline sales had to be estimated using the published number of gasoline stations in the area if available or prorating the total state sales in relation to the area population.

G. The PSU and county cards were then read into the computer, the PSU population and gas sales totals were aggregated for each PSU, and these figures were added to the PSU computer records. The computer also counted the number of counties aggregated to each PSU and this number was checked against the number of counties assigned to each PSU when it was formed. This led to the discovery of 34 counties which were initially aggregated to the wrong PSU due to coding or keypunching error, and these PSUs were corrected. Complete computer printout listings of the two sets of PSUs with their component counties are being provided to NHTSA as a supplement to this report.

H. For each plan the per capita gasoline sales for each PSU was calculated and added to the PSU record; the cut-off points for each third of the rural PSUs on per capita gasoline sales were determined; and the urbanicity code for the high and average gas sales PSUs was changed to "7" and "6" respectively.

I. For each plan the PSUs were then sorted into the 63 regional-urbanicity-gas sales strata; within each stratum the PSUs were ordered alphabetically in relation to state and number of county components; and cumulative population totals were calculated and added to the PSU record for all the ordered PSUs within each stratum. The list of Plan 1 PSUs ordered by strata is given in Appendix A, and the Plan 2 PSUs are listed in Appendix B.

It should be mentioned that a few of the PSUs formed did not quite reach the desired minimum population levels, usually due to the desire to keep the PSUs as geographically coherent as possible. In Plan 1 a total of 39 PSUs had 1974 populations less than 100,000, and 16 of these had populations less than 98,000. The smallest Plan 1 PSU is composed of two counties south of New Orleans with 83,300 people. In Plan 2, 30 PSUs have a 1974 population of less than 200,000, and 14 of these are under 198,000. The smallest Plan 2 PSU is one formed of four counties between Puget Sound and the Cascades north of the Seattle-Everett SMSA with 179,600 people.

3.5 Procedures for Selecting a Sample of PSUs

As mentioned earlier, NHTSA requested that the probabilities of selection of each stratum in Plan 1 and Plan 2 be calculated for samples of seven different numbers of PSUs: 10, 15, 20, 25, 30, 35, and 40. The Groves-Hess Controlled Selection Program (CONSEL - see Appendix C) has been used to produce 14 sets of possible patterns of PSU allocations among the 62 non-empty Plan 1 strata and the 59 non-empty Plan 2 strata. This program constrains the possible patterns of allocation in relation to the total populations of the PSUs in each stratum and the total populations of each region and urbanicity type to which a particular stratum belongs. The program also weights each possible pattern by its random probability of occurrence within these marginal constraints.*

In developing a nationally representative sample of PSUs it is desirable from a statistical point of view to have an even number of non-self-representing PSUs. This permits the assignment of these PSUs into pairs of similar PSUs for the calculation of sampling errors for the accident data collected from the PSUs. Also it is

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*Fuller expositions on the controlled selection rationale and procedure are given in Roe Goodman and Leslie Kish, "Controlled Selection - A Technique in Probability Sampling", *Journal of the American Statistical Association*, 45:350-372 (1950) and in Irene Hess and K. S. Srikantan, "Some Aspects of the Probability Sampling Technique of Controlled Selection" pages 122-166 of *Probability Sampling of Hospitals and Patients*, second edition, by Irene Hess, Donald C. Riedel, and Thomas B. Fitzpatrick (Ann Arbor: Health Administration Press, 1975).

desirable that any PSU with more than 1/xth of the total national population (where x = the number of PSUs) be selected with certainty as a self-representing PSU. These two factors have led to slight modifications in the numbers of strata selections used in the CONSEL program to derive the possible patterns of PSU allocations.

With 10, 15, 20, and 25 PSU samples no PSU is large enough to be selected with certainty, so to make an even number of non-self-representing PSUs these sample sizes were changed to 10, 16, 20, and 26 PSUs. In a 30 PSU sample New York City is selected with certainty, so this option is changed to 31 total PSUs, 30 non-self-representing PSUs plus New York City. In a 35 PSU sample New York City and Los Angeles County are selected with certainty, so this option is changed to 36 total PSUs, 34 non-self-representing PSUs plus New York and Los Angeles. In a 40 PSU sample New York City, Los Angles County, and Cook County (Chicago) are to be selected with certainty, so this option is changed to 41 total PSUs, 38 non-self-representing PSUs plus the three self-representing ones. These distributions are shown in Table 3.5.1.

The CONSEL computer program requires as input to the program a matrix of the probabilities of selection for each stratum. These probabilities are the result of dividing the stratum population (minus any self-representing PSU from that stratum) by the average size of the non-self-representing PSUs (total population of non-self-representing PSUs divided by the total number of non-self-representing PSUs to be chosen). These stratum selection probabilities for the 14 possible plans (seven sample sizes for PSU Plan 1 and seven sample sizes for PSU Plan 2) are presented in Tables 3.5.2.-3.5.9.

From each of the 14 CONSEL runs using these 14 input matrices one copy of the computer output is being provided to

TABLE 3.5.1. SELF-REPRESENTING AND NON-SELF-REPRESENTING PSUs BY DIFFERENT SAMPLE SIZES AND THE NUMBERS OF POSSIBLE PATTERNS OF STRATUM ALLOCATIONS FOR NON-SELF-REPRESNTING PSUs

Number of PSUs To be Included in Sample	Self-Representing PSUs	Number of Non-Self-Representing PSUs	Number of Possible Patterns of Selection For Non-Self-Representing PSUs	
			Plan 1	Plan 2
10	None	10	62	53
16	None	16	43	42
20	None	20		
26	None	26		
31	New York City	30		
36	New York City Los Angeles County	34		43
41	New York City Los Angeles County Cook County, ILL	38		45

NHTSA. This output lists the possible patterns of strata allocation for each of the 14 potential plans. Associated with each pattern is a weight value which represents the probability of that particular pattern, and these weights are also cumulated as each pattern is printed. The number of potential patterns for each plan is shown in Table 3.5.1.

After a decision is reached as to which of the proposed NASS sample designs to implement, the following procedure should be followed in selecting the actual national sample of non-self-representing PSUs (the self-representing PSUs for each plan are already identified). First, the appropriate CONSEL output of possible strata allocation patterns should be consulted, and a random number between 1 and 10,000 should be used to pick a particular pattern in relation to the cumulative weights associated with each pattern (which weights total 10,000). Secondly, the Appendix A or Appendix B lists of PSUs by strata should be used to select the particular PSUs designated for each stratum by the chosen allocation pattern. This PSU selection should be carried out by choosing a random number between one and the total stratum population and comparing this number with the cumulative stratum population associated with each PSU. In the case of two selections in one stratum it is recommended that the stratum be divided into two half-strata with one selection from each. After the PSUs are selected the computer listing of the PSUs and their component counties should be consulted in order to learn the exact boundaries of each chosen PSU. Finally the selected non-self-representing PSUs should be arbitrarily assigned to "superstrata" each containing two PSUs which should be as similar as possible in regard to region and urbanicity type. These "superstrata" would be used in the calculation of sampling errors for accident data collected from the selected PSUs.

TABLE 3.5.2. BASIC PROBABILITIES OF STRATA SELECTION IN PLAN 1 WITH NO SELF-REPRESENTING PSU.

Region	Urbanicity Type							
	Large Urban	Small Urban	Large Suburb	Small Suburb	Rural Low Gas	Rural Av. Gas	Rural Hi Gas	Total
N Eng.	.0173	.0156	.0094	.0043	.0048	.0043	.0022	.0579
Matl.	.0960	.0186	.0330	.0071	.0093	.0117	.0017	.1774
Satl.	.0816	.0300	.0193	.0189	.0073	.0224	.0149	.1944
EN Cen.	.0158	.0112	.0057	.0078	.0010	.0116	.0263	.0794
WN Cen.	.0429	.0279	.0176	.0159	.0259	.0156	.0121	.1579
ES Cen.	.0136	.0117	0.	.0087	.0199	.0088	.0010	.0637
WS Cen.	.0372	.0203	.0019	.0115	.0107	.0082	.0080	.0979
Mt.	.0158	.0079	.0034	.0005	.0011	.0035	.0128	.0449
Pac.	.0835	.0121	.0075	.0034	.0023	.0065	.0062	.1265
Total	.4037	.1552	.0978	.0782	.0823	.0926	.0852	1.0000

Note: These probabilities can be multiplied by the number of PSUs in a sample (10, 16, 20, 26, etc.) to obtain the strata probabilities for that sample.

TABLE 3.5.3. PROBABILITIES OF STRATA SELECTION IN PLAN 1 WITH 30 NON-SELF-REPRESENTING PSUs (31 TOTAL PSUs)

Region	Urbanicity Type Large Urban	Small Urban	Large Suburb	Small Suburb	Rural Low Gas	Rural Av. Gas	Rural Hi Gas	Total
N Eng.	.5392	.4869	.2917	.1335	.1482	.1342	.0677	1.8014
Matl.	1.8631	.5778	1.0278	.2222	.2892	.3655	.0516	4.3972
Satl.	2.5402	.9299	.6019	.5879	.2283	.6972	.4644	6.0498
EN Cen.	.4919	.3483	.1775	.2441	.0313	.3595	.8180	2.4706
WN Cen.	1.3358	.8670	.5492	.4959	.8046	.4862	.3766	4.9153
ES Cen.	.4222	.3630	0.	.2714	.6207	.2731	.0311	1.9815
WS Cen.	1.1588	.6305	.0581	.3621	.3326	.2558	.2489	3.0468
Mt.	.4919	.2430	.1053	.0163	.0332	.1080	.3987	1.3964
Pac.	2.7556	.3768	.2326	.1057	.0731	.2028	.1944	3.9410
Total	11.5987	4.8232	3.0441	2.4391	2.5612	2.8823	2.6514	30.0000

Self-Representing PSU: New York City

TABLE 3.5.4. PROBABILITIES OF STRATA SELECTION FOR PLAN 1 PSUs WITH 34 NON-SELF-REPRESENTING PSUs (36 TOTAL PSUs)

	Urbanicity Type							
	Large Urban	Small Urban	Large Suburb	Small Suburb	Rural Low Gas	Rural Av.Gas	Rural Hi Gas	Total
N Eng.	.6327	.5713	.3452	.1966	.1739	.1574	.0794	2.1135
Matl.	2.1854	.5781	1.2062	.2602	.3393	.4299	.0606	5.1603
Satl.	2.9809	1.0912	.7062	.6899	.2579	.8191	.5419	7.0991
EN Cen.	.5773	.4037	.2083	.2854	.0368	.4218	.9599	2.8992
WN Cen.	1.5674	1.0173	.6444	.5619	.9441	.5705	.4419	5.7675
ES Cen.	.4955	.4260	0.	.3185	.7283	.3205	.0365	2.3253
WS Cen.	1.3598	.7388	.0581	.4249	.3903	.3001	.2421	3.5751
Mt.	.5772	.2852	.1235	.0192	.0390	.1267	.4678	1.6386
Pac.	2.0305	.4421	.2729	.1241	.0957	.2380	.2281	3.4214
Total	12.4077	5.6597	3.5718	2.8823	3.0053	3.3820	3.1112	34.0000

Self-Representing PSUs: New York City and Los Angeles County

TABLE 3.5.5. PROBABILITIES OF STRATA SELECTION FOR PLAN 1 PSUs WITH 38 NON-SELF-REPRESENTING PSUs (41 TOTAL PSUs)

	Urbanicity Type							
Region	Large Urban	Small Urban	Large Suburb	Small Suburb	Rural Low Gas	Rural Av. Gas	Rural Hi Gas	Total
N Eng.	.7271	.6565	.3933	.1800	.1998	.1809	.0913	2.4289
Matl.	2.5126	.7792	1.3861	.2997	.3899	.4929	.0696	5.9300
Satl.	2.3534	1.2540	.8116	.7928	.3078	.9402	.6262	7.0860
EN Cen.	.6634	.4696	.2394	.3291	.0422	.4847	1.1031	3.3315
WN Cen.	1.8013	1.1691	.7405	.6687	1.0849	.6556	.5078	6.6280
ES Cen.	.5694	.4895	0.	.3660	.8369	.3683	.0420	2.6721
WS Cen.	1.5626	.8502	.0793	.4883	.4475	.3449	.3356	4.1084
Mt.	.6634	.3277	.1420	.0220	.0448	.1455	.5376	1.8831
Pac.	2.3334	.5081	.3127	.1426	.0995	.2735	.2622	3.9320
Total	13.1866	6.5039	4.1050	3.2892	3.4533	3.8866	3.5754	38.0000

Self-Representing PSUs: New York City, Los Angeles County, and Cook County

TABLE 3.5.6. BASIC PROBABILITIES OF STRATA SELECTION IN PLAN 2 WITH NO SELF-REPRESENTING PSUs

	Urbanicity Type							
Region	Large Urban	Small Urban	Large Suburb	Small Suburb	Rural Low Gas	Rural Av. Gas	Rural Hi Gas	Total
N Eng.	.0184	.0172	.0095	.0041	.0029	.0028	.0028	.0578
Matl.	.0860	.0219	.0560	.0043	.0032	.0030	.0031	.1775
Satl.	.0816	.0224	.0193	.0202	.0043	.0172	.0134	.1944
EN Cen.	.0153	.0156	.0057	.0080	0.	.0080	.0243	.0754
WN Cen.	.0420	.0261	.0182	.0174	.0238	.0121	.0062	.1579
ES Cen.	.0126	.0150	0.	.0052	.0204	.0104	.0011	.0627
WS Cen.	.0272	.0235	.0019	.0071	.0143	.0081	.0043	.0979
Mt.	.0156	.0118	.0034	0.	0.	.0031	.0106	.0443
Pac.	.0325	.0141	.0075	.0021	.0032	.0032	.0073	.1265
Total	.4079	.2012	.0886	.0684	.0721	.0771	.0747	1.0000

Note: These probabilities can be multiplied by the number of PSUs in a sample (10, 16, 20, 26, etc.) to obtain the strata probabilities for that sample.

TABLE 3.5.7. PROBABILITIES OF STRATA SELECTION FOR PLAN 2 PSUs WITH 30 NON-SELF-REPRESENTING PSUs (31 TOTAL PSUs)

Region	Urbanicity Type Large Urban	Small Urban	Large Suburb	Small Suburb	Rural Low Gas	Rural Av. Gas	Rural Hi Gas	Total
N Eng.	.5035	.3548	.2231	.1231	.0311	.1180	.1036	1.6012
Matl.	1.8422	.6210	1.0278	.1954	.2545	.2203	.0352	4.3973
Satl.	2.5404	1.1911	.6019	.6292	.1328	.5340	.4175	6.0499
EN Cen.	.4219	.5172	.1775	.2488	0.	.2791	.7554	2.4705
WN Cen.	1.2236	1.1223	.5652	.5423	.7409	.4067	.1942	4.9152
ES Cen.	.4222	.4676	0.	.0999	.6258	.3223	.0337	1.2915
WS Cen.	1.1532	.3167	.0531	.2156	.2901	.2528	.1507	3.0469
Mt.	.4313	.3272	.1033	0.	0.	.1036	.3265	1.3365
Pac.	2.7557	.4403	.2326	.0661	.0390	.1001	.2473	3.9411
Total	11.5733	6.2513	3.0675	2.1294	2.2442	2.3378	2.3261	30.0000

Self-Representing PSU: New York City

TABLE 3.5.8. PROBABILITIES OF STRATA SELECTION FOR PLAN 2 PSUs WITH 34 NON-SELF-REPRESENTING PSUs (36 TOTAL PSUs)

	Urbanicity Type							
Region	Large Urban	Small Urban	Large Suburb	Small Suburb	Rural Low Gas	Rural Av. Gas	Rural Hi Gas	Total
N Eng.	.5378	.6511	.2162	.1513	.1063	.1384	.1216	2.1127
Matl.	2.1364	.7731	1.2061	.2233	.2966	.3288	.1117	5.1600
Satl.	2.3308	1.4013	.7062	.7333	.1558	.6267	.4555	7.0351
EN Cen.	.5772	.6072	.2033	.2515	0.	.3275	.3364	2.3350
WN Cen.	1.5720	1.3168	.6673	.6264	.2334	.4772	.2278	5.7676
ES Cen.	.4955	.5437	0.	.1161	.7461	.3734	.0395	2.2253
WS Cen.	1.2558	1.0757	.0631	.2576	.3401	.2766	.1763	3.3751
Mt.	.5772	.4063	.1233	0.	0.	.1216	.3354	1.6266
Pac.	2.0208	.5167	.2723	.0773	.1162	.1175	.2301	3.4215
Total	12.3776	7.3411	3.5533	2.4336	2.6334	2.8127	2.7333	34.0000

Self-Representing PSUs: New York City and Los Angeles County

TABLE 3.5.9. PROBABILITIES OF STRATA SELECTION FOR PLAN 2 PSUs WITH 38 NON-SELF-REPRESENTING PSUs (41 TOTAL PSUs)

Region	Large Urban	Small Urban	Large Suburb	Small Suburb	Rural Low Gas	Rural Av. Gas	Rural Hi Gas	Total
	Urbanicity Type							
N Eng.	.2271	.7442	.2260	.1741	.1228	.1541	.1387	2.4290
Matl.	2.5124	.9181	1.3350	.2615	.3402	.3779	.1224	5.9297
Satl.	2.3532	1.6102	.8116	.3484	.1791	.7202	.5630	7.0657
EN Cen.	.6634	.5923	.2394	.3352	0.	.3764	1.0187	3.3217
WN Cen.	1.8055	1.5134	.7676	.7313	.9941	.5484	.2618	6.6251
ES Cen.	.5894	.6605	0.	.1334	.8574	.4360	.0454	2.6722
WS Cen.	1.5226	1.2322	.0733	.2941	.3912	.3405	.2033	4.1085
Mt.	.5554	.4951	.1420	0.	0.	.1397	.4430	1.9002
Pac.	2.3334	.5412	.3137	.0891	.1335	.1350	.3324	3.9219
Total	13.1514	8.4441	4.1355	2.8714	3.0263	3.2325	3.1367	38.0000

Self-Representing PSUs: New York City, Los Angeles County and Cook County

APPENDIX A

PLAN 1 PSUs ORGANIZED BY REGIONAL AND URBANICITY STRATA

APPENDIX A

LIST OF PLAN 1 PSUS ORGANIZED BY REGIONAL AND URBANICITY STRATA

THE THREE NUMBERS IN FRONT OF THE PSU NAME ARE THE STRATA CODE, THE PSU IDENTIFICATION NUMBER, AND THE NUMBER OF COUNTIES IN THE PSU. THE FOUR NUMBERS FOLLOWING THE PSU NAME ARE THE TOTAL PSU POPULATION, THE TOTAL PSU GAS SALES, THE GAS SALES PER CAPITA, AND THE CUMULATIVE POPULATION TOTAL WITHIN THE STRATUM.

```
11 NEW ENGLAND, LARGE URBAN PSUS
11  709  1 HARTFORD SMSA(-TOLLAND COUNTY),CT 649900  109417 168  649900
11  706  1 NEW HAVEN SMSA, CT                415400   68044 163 1065300
11  703  1 BRIDGEPORT SMSA, CT               394900   67086 169 1460200
11 2205  1 SUFFOLK COUNTY, MA(BOSTON)        713400   66737  93 2173600
11 2219  1 HAMPDEN COUNTY, MA(SPRINGFIELD)   460700   68354 148 2634300
11 2215  1 WORCESTER SMSA(MASS) + 8, MA      425800   53653 126 3060100
11 4001  1 PROVIDENCE COUNTY, RI             582500   75177 129 3642600
12 NEW ENGLAND, SMALL URBAN PSUS
12  705  1 WATERBURY SMSA (+3), CT           266400   33983 127  266400
12  713  1 NEW LONDON SMSA, CT               224900   34614 154  491300
12  701  1 STAMFORD SMSA, CT                 202000   45703 226  693300
12  704  1 DANBURY SMSA (+2), CT             145200   22268 153  838500
12  707  1 NEW BRITAIN SMSA, CT              145000   27051 186  983500
12  702  1 NORWALK SMSA, CT                  128300   22209 173 1111800
12  708  2 BRISTOL SMSA + LITCH. NON-SMSA,CT 160100   23108 144 1271900
12  711  2 MERIDEN SM & MIDD. NON-SM(+2), CT 133800   22607 168 1405700
12 2002  1 CUMBERLAND, ME(PORTLAND)          201500   33373 165 1607200
12 2003  2 ANDROSCOGGIN & 1, ME(LEWISTON)    120500   14591 121 1727700
12 2202  1 LAWRENCE SMSA, MA                 229100   35780 156 1956800
12 2203  1 LOWELL SMSA, MA                   226200   29055 128 2183000
12 2212  1 NEW BEDFORD SMSA, MA              163800   20844 127 2346800
12 2208  1 BROCKTON SMSA, MA                 160800   22873 142 2507600
12 2220  1 BERKSHIRE COUNTY, MA(PITTSFIELD)  149000   23490 157 2656600
12 2211  1 FALL RIVER SMSA, MA               145900   17908 122 2802500
12 2210  1 FITCHBURG SMSA, MA                100600   15887 157 2903100
12 3001  1 HILLSBOROUGH, NH(MANCHESTER)      238500   38198 160 3141600
12 4002  1 KENT, RI(WARWICK)                 147700   21583 146 3289300
13 NEW ENGLAND, LARGE SUBURBAN PSUS
13 2221  1 MIDDLESEX PART(61), BOS. SMSA, MA1137300  160208 140 1137300
13 2206  1 NORFOLK PART(-2), BOSTON SMSA, MA 542700   83902 154 1680000
13 2204  1 ESSEX PART(-4), BOSTON SMSA, MA   290500   39751 136 1970500
14 NEW ENGLAND, SMALL SUBURBAN PSUS
14  710  1 TOLLAND COUNTY, CT(HARTFORD METRO 111300   17234 154  111300
14 2207  1 PLYMOUTH PART(61), BOSTON SMSA,MA 159500   21436 134  270800
14 2218  1 HAMPSHIRE COUNTY, MA(SPRING. M)   135400   17381 128  406200
14 2201  1 BEVERLY & 10, ESSEX, MA(BOS. MET) 127100   16906 133  533300
14 2209  1 ATTLEBORO & 6, MA(PROVIDENCE MET) 101400   18455 182  634700
14 3002  1 ROCKINGHAM, NH(LAWRENCE METRO)    160100   30306 189  794800
14 4004  2 BRISTOL & 4, RI                   107100   11943 111  901900
15 NEW ENGLAND, RURAL LOW GAS SALES PSUS
15  712  2 WINDHAM COUNTY(+4), CT             99900   11593 116   99900
15 2004  2 KENNEBEC-LINCOLN, ME(SOUTH)       122900   17613 143  222800
15 2005  4 WALDO-KNOX-HAN.-WASH., ME(SE)     127000   17808 140  349800
15 2214  2 MARLBORO & 17, WORC.-MIDDLE., MA  164400   19976 121  514200
15 2217  2 FRANKLIN-NW WORCESTER COUNTIES,MA 128500   17552 136  642700
15 2216  2 PLYMOUTH-BRISTOL NON-SMSA(-1), MA 113300   15611 137  756000
15 3004  2 STRAFFORD-BELKNAP, NH(EAST)       115000   16854 146  871000
15 4003  2 WASHINGTON & 2, RI(SOUTH)         130100   18532 142 1001100
16 NEW ENGLAND, RURAL AVERAGE GAS SALES PSUS
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16 2001  1 YORK, ME(SW)                            118900    19544 164    118900
16 2008  1 AROOSTOOK, ME(NE)                        95600    14969 156    214500
16 2007  2 PENOBSCOT-PISCATAQUIS, ME(CEN)          149600    27151 181    364100
16 2006  3 OXFORD-FRANKLIN-SOMERSET, ME(WEST       110600    17479 158    474700
16 3003  3 MERRIMACK & 2, NH(SOUTH)                177800    26698 150    652500
16 4001  3 CHITTENDEN & 2, VT(NW)                  141900    23203 163    794400
16 4003  3 RUTLAND & 2, VT(SW)                     112000    20301 181    906400
17 NEW ENGLAND, RURAL HIGH GAS SALES PSUS
17 2213  3 BARNSTABLE-DUKES-NANTUCKET, MA          124600    31817 255    124600
17 3005  3 GRAFTON-CARROLL-COOS, NH(NORTH)         116400    24966 214    241000
17 4004  3 WINDSOR & 2, VT(SE)                     100800    21497 213    341800
17 4002  3 WASHINGTON & 4, VT(NE)                  115600    22139 191    457400
21 MIDDLE ATLANTIC, LARGE URBAN PSUS
21 3106  1 ESSEX, NJ(NEWARK)                       896700   104510 116    896700
21 3110  1 MIDDLESEX, NJ(NEW BRUNSWICK)            590200    95045 161   1486900
21 3107  1 HUDSON, NJ(JERSEY CITY)                 583000    62770 107   2069900
21 3111  1 MONMOUTH, NJ(LONG BRANCH)               485700    73033 150   2555600
21 3104  1 PASSAIC, NJ(PATERSON)                   456200    60497 132   3011800
21 3112  1 MERCER, NJ(TRENTON)                     319100    51442 161   3330900
21 3335  1 NEW YORK CITY, NY                      7567100   470525  62  10898000
21 3336  1 NASSAU, NY                             1398000   274102 196  12296000
21 3337  1 SUFFOLK, NY(NASSAU METRO)              1222700   164582 134  13518700
21 3302  1 ERIE, NY(BUFFALO)                      1093400   131378 120  14612100
21 3306  1 MONROE, NY(ROCHESTER)                   706900    99166 140  15319000
21 3313  1 ONONDAGA, NY(SYRACUSE)                  472200    68517 145  15791200
21 3940  1 PHILADELPHIA, PA                       1841800   157317  85  17633000
21 3908  1 ALLEGHENY, PA(PITTSBURG)               1532100   205225 133  19165100
21 3932  1 LUZERNE, PA(WILKES-BARRE)               347400    51330 147  19512500
21 3929  1 LANCASTER, PA                           337900    50790 150  19850400
21 3930  1 BERKS, PA(READING)                      304500    45657 149  20154900
22 MIDDLE ATLANTIC, SMALL URBAN PSUS
22 3115  2 ATLANTIC-CAPE MAY, NJ(ATL. CITY)        260600    42735 163    260600
22 3118  2 CUMBERLAND-SALEM, NJ(VINELAND)          193100    33234 198    453700
22 3327  1 ALBANY, NY                              288700    36251 125    742400
22 3317  1 ONEIDA, NY(UTICA)                       270300    37151 137   1012700
22 3314  1 BROOME, NY(BINGHAMTON)                  216900    35424 163   1229600
22 3326  1 SCHENECTADY, NY                         159900    22103 138   1389500
22 3325  1 RENSSELAER, NY(TROY)                    153800    20819 135   1543300
22 3331  2 DUTCHESS-PUTNAM, NY(POUGHKEEPSIE)       299200    35798 119   1842500
22 3316  2 CHEMUNG-SCHUYLER, NY(ELMIRA)            116800    15654 135   1959300
22 3928  1 YORK, PA                                284000    48741 171   2243300
22 3902  1 ERIE, PA                                273700    46547 170   2517000
22 3936  1 LEHIGH, PA(ALLENTOWN)                   263300    42014 159   2780300
22 3934  1 LACKAWANNA, PA(SCRANTON)                233400    34158 146   3013700
22 3926  1 DAUPHIN, PA(HARRISBURG)                 226800    41597 153   3240500
22 3937  1 NORTHAMPTON, PA(BETHLEHEM)              222600    27492 123   3463100
22 3917  1 CAMBRIA, PA(JOHNSTOWN)                  188800    25722 136   3651900
22 3916  1 BLAIR, PA(ALTOONA)                      135600    19906 146   3787500
22 3923  1 LYCOMING, PA(WILLIAMSPORT)              116400    19476 167   3903900
23 MIDDLE ATLANTIC, LARGE SUBURBAN PSUS
23 3105  1 BERGEN, NJ(N.Y. METRO)                  874600   159653 182    874600
23 3108  1 UNION, NJ(NEWARK METRO)                 526500    87531 166   1401100
23 3116  1 CAMDEN, NJ(PHIL. METRO)                 476700    64727 134   1877800
23 3103  1 MORRIS, NJ(NEWARK METRO)                395900    61762 156   2273700
23 3113  1 BURLINGTON, NJ(PHIL. METRO)             346700    54202 156   2620400
23 3109  1 SOMERSET, NJ(NEWARK METRO)              200200    31467 157   2820600
23 3334  1 WESTCHESTER, NY(N.Y. METRO)             880800   145066 168   3701400
23 3333  1 ROCKLAND, NY(N.Y. METRO)                246000    36398 147   3947400
23 3303  1 NIAGARA, NY(BUFFALO METRO)              237300    26946 121   4184700
23 3939  1 MONTGOMERY, PA(PHIL. METRO)             632100   116022 186   4816800
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23 3942  1 DELAWARE, PA(PHIL. METRO)              589400   83559 141  540620
23 3938  1 BUCKS, PA(PHIL. METRO)                 448200   68760 153  585440
23 3910  1 WESTMORELAND, PA(PITTS. METRO)         378500   61492 162  623290
23 3941  1 CHESTER, PA(PHIL. METRO)               288200   43480 150  652110
23 3907  1 WASHINGTON, PA(PITTS. METRO)           213700   38281 173  673480
23 3906  1 BEAVER, PA(PITTS. METRO)               209200   30425 145  694400
24 MIDDLE ATLANTIC, SMALL SUBURBAN PSUS
24 3117  1 GLOUCESTER, NJ(PHIL. METRO)            186900   30850 165   18690
24 3102  2 WARREN-HUNTERDON, NJ(BETH. METRO)      156600   29227 186   34350
24 3323  1 SARATOGA, NY(ALBANY METRO)             140700   18449 131   48420
24 3315  1 OSWEGO, NY(SYRACUSE METRO)             108500   14861 136   59270
24 3307  2 ONTARIO-LIVINGSTON, NY(ROCH. METR      140500   23219 165   73320
24 3318  2 MADISON-HERKIMER, NY(CEN)              132700   17759 133   86590
24 3309  2 WAYNE-SENECA, NY(ROCH. METRO)          114500   18207 159   98040
24 3322  3 MONTGOMERY & 2, NY(ALBANY METRO)       116900   16136 138  109730
24 3920  1 CUMBERLAND, PA(HARRIS. METRO)          167300   40183 240  126460
24 3935  2 CARBON-MONROE, PA(NE-ALL. METRO)       104600   28378 271  136920
24 3918  3 SOMERSET & 2, PA(JOHNSTOWN METRO)      132300   39277 296  150150
25 MIDDLE ATLANTIC, RURAL LOW GAS SALES PSUS
25 3114  1 OCEAN, NJ(EAST)                        285600   41376 144   28560
25 3101  1 SUSSEX, NJ(NW)                          95500   11732 122   38110
25 3301  1 CHAUTAUQUA, NY(SW)                     148000   21897 147   52910
25 3320  2 ST. LAWRENCE-FRANKLIN, NY(NORTH)       161800   16051  99   69090
25 3305  2 CATTARAUGUS-ALLEGANY, NY(SW)           134500   16702 124   82540
25 3312  2 TOMPKINS-TIOGA, NY(SOUTH)              131100   13772 143   95650
25 3311  2 CAYUGA-CORTLAND, NY(CEN)               125700   17043 135  108220
25 3306  2 STEUBEN-YATES, NY(SOUTH)               120800   17683 146  120300
25 3321  2 CLINTON-ESSEX, NY(NE)                  117200   16143 137  132020
25 3319  2 OTSEGO-CHENANGO, NY(CEN)               107700   11267 104  142790
25 3304  3 GENESEE & 2, NY(WEST)                  136400   20160 147  156430
25 3328  3 GREENE & 2, NY(EAST)                   121900   17159 141  168620
25 3911  2 ARMSTRONG-INDIANA, PA(WC)              160100   22635 141  184630
25 3924  3 BRADFORD-TIOGA-SULLIVAN, PA(NORTH      107300   15283 142  195360
26 MIDDLE ATLANTIC, RURAL AVERAGE GAS SALES PSUS
26 3332  1 ORANGE, NY(SOUTH)                      239700   37204 155   23970
26 3330  1 ULSTER, NY(SOUTH)                      152900   25153 164   39260
26 3316  2 JEFFERSON-LEWIS, NY(NORTH)             115900   17205 148   50850
26 3324  2 WARREN-WASHINGTON, NY(EAST)            107000   15922 148   61550
26 3329  2 DELAWARE-SULLIVAN, NY(SOUTH)           106400   19152 180   72190
26 3931  1 SCHUYLKILL, PA(EC)                     160800   27945 173   88270
26 3903  1 MERCER, PA(WEST)                       128800   21166 164  101150
26 3904  1 LAWRENCE, PA(WEST)                     107200   17253 160  111870
26 3915  1 CENTRE, PA(CEN)                        106400   19464 182  122510
26 3927  1 LEBANON, PA(EC)                        104100   17613 169  132920
26 3909  2 FAYETTE-GREENE, PA(SW)                 193400   34715 179  152260
26 3919  2 FRANKLIN-ADAMS, PA(SOUTH)              166700   25836 154  168930
26 3901  2 CRAWFORD-VENANGO, PA(NW)               148600   26314 177  183790
26 3925  3 NORTHUMBERLAND & 2, PA(EC)             175800   30820 175  201370
26 3913  3 WARREN-MCKEAN-POTTER, PA(NORTH)        115500   20025 173  212920
26 3922  3 CLINTON-UNION-SNYDER, PA(CEN)          100500   17573 175  222970
26 3921  4 HUNTINGDON & 3, PA(CEN)                134900   20012 148  236460
26 3933  4 SUSQUEHANNA & 3, PA(NE)                104800   18333 179  246940
27 MIDDLE ATLANTIC, RURAL HIGH GAS SALES PSUS
27 3905  1 BUTLER, PA(WEST)                       135400   26041 192   13540
27 3914  3 CLEARFIELD-ELK-CAMERON, PA(WC)         121400   28082 231   25680
27 3912  3 JEFFERSON-CLARION-FOREST, PA(WC)        91900   22438 243   34870
31 EAST NORTH CENTRAL, LARGE URBAN PSUS
31 1412  1 COOK, IL(CHICAGO)                     5371900  738592 137  537190
31 1515  1 MARION, IN(INDIANAPOLIS)               792200  154806 195  616410
31 1501  1 LAKE, IN(GARY)                         549400   90976 165  671350
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31 2310  1 WAYNE, MI(DETROIT)                      2556300  373429 146  9269800
31 2320  1 GENESEE, MI(FLINT)                       453900   80927 178  9723700
31 2318  1 KENT, MI(GRAND RAPIDS)                   419500   79185 188 10143200
31 3038  1 CUYAHOGA, OH(CLEVELAND)                 1620500  250913 154 11763700
31 3047  1 HAMILTON, OH(CINCINNATI)                 902000  151333 167 12665700
31 3028  1 FRANKLIN, OH(COLUMBUS)                   859100  143899 167 13524800
31 3043  1 MONTGOMERY, OH(DAYTON)                   595400   98792 165 14120200
31 3014  1 SUMMIT, OH(AKRON)                        540100   96040 178 14660300
31 3013  1 LUCAS, OH(TOLEDO)                        481600   75666 157 15141900
31 3016  1 STARK, OH(CANTON)                        380000   58092 152 15521900
31 3012  1 MAHONING, OH(YOUNGSTOWN)                 303600   45752 150 15825500
31 5008  1 MILWAUKEE, WI                           1033600  143350 138 16859100
31 5014  1 DANE, WI(MADISON)                        303000   55699 183 17162100
32 EAST NORTH CENTRAL, SMALL URBAN PSUS
32 1404  1 WINNEBAGO, IL(ROCKFORD)                  243800   44094 180   243800
32 1418  1 PEORIA, IL                               198900   36759 184   442700
32 1427  1 SANGAMON, IL(SPRINGFIELD)                167000   33066 198   609700
32 1423  1 CHAMPAIGN, IL                            163000   27456 168   772700
32 1407  1 ROCK ISLAND, IL                          162700   30613 188   935400
32 1426  1 MACON, IL(DECATUR)                       125200   23206 185  1060600
32 1416  1 MC LEAN, IL(BLOOMINGTON)                 114400   28093 245  1175000
32 1414  1 KANKAKEE, IL                              95900   16590 172  1270900
32 1507  1 ALLEN, IN(FORT WAYNE)                    288900   49584 171  1559800
32 1514  1 ST. JOSEPH, IN(SOUTH BEND)               245300   41016 167  1805100
32 1532  1 VANDERBURGH, IN(EVANSVILLE)              164200   28733 174  1969300
32 1517  1 MADISON, IN(ANDERSON)                    139400   24090 172  2108700
32 1519  1 DELAWARE, IN(MUNCIE)                     131600   23261 176  2239300
32 1528  1 VIGO, IN(TERRE HAUTE)                    112700   22172 196  2352000
32 1512  1 TIPPECANOE, IN(LAFAYETTE)                112200   19859 177  2464200
32 1526  2 MONROE-BROWN, IN(BLOOMINGTON)             98800   14470 146  2563000
32 2314  1 INGHAM, MI(LANSING)                      266700   43343 162  2829700
32 2309  1 WASHTENAW, MI(ANN ARBOR)                 250100   40983 163  3079800
32 2323  1 SAGINAW, MI                              226900   35091 154  3306700
32 2306  1 KALAMAZOO, MI                            200900   34036 169  3507600
32 2317  1 MUSKEGON, MI                             156700   25512 162  3664300
32 2308  1 JACKSON, MI                              145000   24314 167  3809300
32 2307  1 CALHOUN, MI(BATTLE CREEK)                140900   25450 180  3950200
32 2333  1 BAY, MI(BAY CITY)                        119400   19299 161  4069600
32 3007  1 LORAIN, OH                               265800   40103 150  4335400
32 3044  1 BUTLER, OH(HAMILTON)                     242300   38075 157  4577700
32 3011  1 TRUMBULL, OH(WARREN)                     239300   35891 149  4817000
32 3041  1 CLARK, OH(SPRINGFIELD)                   155400   27030 173  4972400
32 3019  1 RICHLAND, OH(MANSFIELD)                  131200   22695 172  5103600
32 3022  1 ALLEN, OH(LIMA)                          108800   23106 212  5212400
32 3032  2 JEFFERSON-HARRISON, OH(STEUBENVIL        113600   16053 141  5326000
32 5010  1 RACINE, WI                               173500   26207 151  5499500
32 5003  1 BROWN, WI(GREEN BAY)                     166600   25158 151  5666100
32 5002  1 WINNEBAGO, WI(OSHKOSH)                   131400   20956 159  5797500
32 5011  1 KENOSHA, WI                              122100   19293 158  5919600
32 5001  1 OUTAGAMIE, WI(APPLETON)                  122100   14973 122  6041700
32 5025  2 EAU CLAIRE-CHIPPEWA, WI                  123600   19639 158  6165300
32 5019  2 LA CROSSE-MONROE, WI                     116800   21063 180  6282100
33 EAST NORTH CENTRAL, LARGE SUBURBAN PSUS
33 1411  1 DU PAGE, IL(NE)                          537800   96402 179   537800
33 1401  1 LAKE, IL(NE)                             394700   75353 190   932500
33 1434  1 ST. CLAIR, IL(ST. LOUIS METRO)           280400   36186 129  1212900
33 1413  1 WILL, IL(NE)                             279800   49424 176  1492700
33 1410  1 KANE, IL(NE)                             264100   48211 182  1756800
33 1433  1 MADISON, IL(ST. LOUIS METRO)             249300   41486 166  2006100
33 2312  1 OAKLAND, MI                              952500  153232 160  2958600
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33 2311  1 MACOMB, MI                               659300   104279 158  361790
33 3609  1 LAKE, OH(CLEVELAND METRO)                202200    35644 176  382010
33 5009  1 WAUKESHA, WI(MIL. METRO)                 246000    38410 156  406610
34 EAST NORTH CENTRAL, SMALL SUBURBAN PSUS
34 1402  1 MC HENRY, IL(NE)                         122900    19964 162   1229
34 1417  2 TAZEWELL-WOODFORD, IL(CEN)               153000    29513 133   2759
34 1408  5 HENRY & 4, IL(NC)                        116700    25397 221   39260
34 1525  2 FLOYD-CLARK, IN(LOUIS. METRO)            138600    27937 201   53120
34 1502  2 PORTER-STARKE, IN(NW)                    115300    25363 228   64650
34 1522  2 JOHNSON-SHELBY, IN(CEN)                  106900    18591 173   75340
34 1516  2 HAMILTON-HANCOCK, IN(CEN)                105400    15739 149   85880
34 1514  3 BOONE-HENDRICKS-MORGAN, IN(CEN)          139200    33719 242   99800
34 1536  4 GIBSON & 3, IN(SW)                        99700    14116 141  109770
34 2316  1 OTTAWA, MI                               139300    18731 134  123700
34 2301  1 MONROE, MI                               124800    17145 137  136180
34 2321  2 LAPEER-ST. CLAIR, MI                     190100    24118 126  155190
34 2313  2 LIVINGSTON-SHIAWASSEE, MI                144400    13547 128  169630
34 2305  2 ALLEGAN-VAN BUREN, MI                    130200    24315 186  182650
34 2315  2 BARRY-EATON, MI                          116200    17208 148  194270
34 2319  2 CLINTON-IONIA, MI                         98600    13554 138  204130
34 3642  1 GREENE, OH(DAYTON METRO)                 126400    17329 137  216770
34 3646  1 CLERMONT, OH(CINCI METRO)                104700    14588 139  227240
34 3604  1 WOOD, OH(TOLEDO METRO)                   100700    23385 232  237310
34 3613  2 PORTAGE-GEAUGA, OH(AK.-CL. METRO)        197900    32245 162  257100
34 3615  2 ASHLAND-MEDINA, OH(CLEVE. METRO)         138800    27169 195  270980
34 3633  2 BELMONT-GUERNSEY, OH(WHEEL. METRO        122100    22512 182  283190
34 3625  2 MIAMI-CHAMPAIGN, OH(DAY.-SPR. M)         119300    18567 155  295120
34 3645  2 WARREN-CLINTON, OH(CINCI METRO)          119200    23062 193  307040
34 3636  2 LANCASTER-PERRY, OH(COLUM. METRO)        112500    15604 138  318290
34 3638  2 PICKAWAY-ROSS, OH(COLUM. METRO)          104700    15545 148  328760
34 3637  3 LAWRENCE & 2, OH(HUNT. METRO)            115700    17683 151  340330
34 3626  3 DELAWARE-UNION-MADISON, OH(COL. M        108100    18053 163  35114
34 3632  4 DEFIANCE & 3, OH(LIMA METRO)             118000    21307 180  362940
34 3634  4 WASHINGTON & 3, OH(PARKERS. METRO         99200    17726 178  372850
34 5007  2 WASHINGTON-OZAUKEE, WI(MIL. METRO        135900    15465 113  386440
34 5028  6 DOUGLAS & 5, WI(DULUTH METRO)            107500    19303 182  39719
35 EAST NORTH CENTRAL, RURAL LOW GAS SALES PSUS
35 1426  2 LEE-WHITESIDE, IL(NW)                     98800    13950 141    9880
35 1421  4 ADAMS & 4, IL(WEST)                      103500    13646 131   20230
35 1521  5 HENRY & 4, IN(EAST)                      125800    18392 146   3281
35 2324  3 GRATIOT-MONTCALM-ISABELLA, MI            132900    19304 145   46100
35 3618  2 WAYNE-HOLMES, OH(NC)                     116000    15706 135   57700
35 3639  2 SCIOTO-PIKE, OH(SOUTH)                    99200    14357 144   67620
35 3635  4 ATHENS & 3, OH(SOUTH)                    106800    14971 140   78300
35 5022  1 MARATHON, WI(NC)                         102800    12259 119   88580
35 5006  1 SHEBOYGAN, WI(EAST)                      100200    11365 113   98600
35 5004  2 FOND DU LAC-CALUMET, WI(EC)              114900    14962 129  110090
35 5005  3 MANITOWOC-KEWAUNEE-DOOR, WI(EAST)        124400    15038 123  122530
35 5017  4 GRANT & 3, WI(SW)                        108400    14138 130  133370
35 5010  4 SAUK & 3, WI(SOUTH)                      106400    15074 141  144010
35 5023  4 OCONTO & 3, WI(NE)                       102200    11513 113  154230
36 EAST NORTH CENTRAL, RURAL AVERAGE GAS SALES PSUS
36 1424  1 VERMILLION, IL(EAST)                      98200    16868 171    9820
36 1403  3 DE KALB & 2, IL(NORTH)                   126700    22997 181   22490
36 1429  3 MC DONOUGH & 2, IL(WEST)                 104300    17037 163   32920
36 1435  3 MONROE-RANDOLPH-JACKSON, IL(SW)          103400    15784 152   43260
36 1405  4 STEPHENSON & 3, IL(NW)                   131500    24136 183   56410
36 1419  4 KNOX & 3, IL(WEST)                       108200    19852 183   67230
36 1432  4 MARION & 3, IL(SOUTH)                    104000    16888 162   77630
36 1437  5 FRANKLIN & 4, IL(SOUTH)                  116400    19428 156   89270
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36 1428  6 MORGAN & 5, IL(WEST)                 129400   22894 176  1022100
36 1431  7 WABASH & 6, IL(SE)                   104400   16650 159  1126500
36 1533  2 HOWARD-TIPTON, IN(CEN)               104300   19166 183  1230800
36 1518  2 GRANT-BLACKFORD, IN(CEN)             100400   17667 175  1331200
36 1529  4 KNOX & 3, IN(SW)                     119300   18989 159  1450500
36 1539  4 HUNTINGTON & 3, IN(NE)               112300   21070 187  1562800
36 1510  5 CASS & 4, IN(NC)                     146900   22810 155  1709700
36 1523  6 RIPLEY & 5, IN(SE)                   115200   21126 183  1824900
36 1531  7 DUBOIS & 6, IN(SOUTH)                137700   21073 153  1962600
36 2302  2 LENAWEE-HILLSDALE, MI                126600   19335 152  2089200
36 2303  3 BRANCH-CASS-ST JOSEPH, MI            135200   20099 148  2224400
36 2322  3 HURON-SANILAC-TUSCOLA, MI            127900   19331 151  2352300
36 2331  5 MARQUETTE & 4, MI                    150000   20732 178  2502300
36 2327  5 MASON-NEW.-OCE.-LAKE-MAN., MI        103000   18762 182  2605300
36 2332  7 HOUGHTON & 6, MI                     116900   21810 186  2722200
36 2329  7 ALPENA & 6, MI                       111400   20483 183  2833600
36 3029  1 LICKING, OH(CEN)                     112100   19240 171  2945700
36 3017  1 COLUMBIANA, OH(EAST)                 110500   17049 161  3056200
36 3010  1 ASHTABULA, OH(NE)                     99400   17883 179  3155600
36 3026  2 ERIE-HURON, OH(NORTH)                130200   21556 165  3285800
36 3030  2 MUSKINGUM-COSHOCTON, OH(EC)          114700   20608 180  3400500
36 3020  2 SENECA-CRAWFORD, OH(NC)              110900   17534 158  3511400
36 3031  2 TUSCARAWAS-CARROLL, OH(EAST)         103900   16433 156  3615300
36 3027  3 MARION-MORROW-KNOX, OH(CEN)          134700   22462 166  3750000
36 3024  3 DARKE-PREBLE-MERCER, OH(WEST)        125800   20537 161  3875800
36 3021  3 HANCOCK-HARDIN-WYANDOT, OH(NC)       117800   18039 153  3994600
36 3040  4 HIGHLAND & 3, OH(SOUTH)              109600   17504 160  4104200
36 5013  1 ROCK, WI(SOUTH)                      134000   23820 177  4238200
36 5012  2 JEFFERSON-WALWORTH, WI(SOUTH)        129900   22069 170  4368100
36 5015  2 COLUMBIA-DODGE, WI(SC)               113500   17306 152  4481600
36 5021  4 PORTAGE & 3, WI(CEN)                 125000   20608 165  4606600
36 5020  5 CLARK & 4, WI(WC)                    103800   17566 169  4710400
37 EAST NORTH CENTRAL, RURAL HIGH GAS SALES PSUS
37 1403  1 LA SALLE, IL(NC)                     108900   27214 249   108900
37 1415  4 LIVINGSTON & 3, IL(EAST)             116500   30603 262   225400
37 1429  4 CHRISTIAN & 3, IL(CEN)               102300   21322 208   327700
37 1425  4 COLES & 3, IL(EAST)                  101400   19309 197   429100
37 1430  6 EFFINGHAM & 5, IL(EAST)              106200   31293 294   535300
37 1422  6 LOGAN & 5, IL(CEN)                   105800   21238 270   641100
37 1436  8 WILLIAMSON & 7, IL(SOUTH)            119700   23418 195   760800
37 1505  1 ELKHART, IN(NORTH)                   135300   27193 200   896100
37 1503  1 LA PORTE, IN(NW)                     105900   24143 227  1002000
37 1520  2 WAYNE-RANDOLPH, IN(EAST)             108700   26409 242  1110700
37 1508  3 KOSCIUSKO & 2, IN(NORTH)             115100   24607 216  1225800
37 1524  4 BARTHOLOMEW & 3, IN(SC)              132500   29350 225  1358300
37 1506  4 NOBLE & 3, IN(NE)                    116400   26351 226  1474700
37 1527  5 PUTNAM & 4, IN(WEST)                 112600   22135 196  1587300
37 1511  5 CARROLL & 4, IN(NW)                  106700   21201 198  1694000
37 1513  6 MONTGOMERY & 5, IN(WEST)             105400   20228 190  1799400
37 2304  1 BERRIEN, MI                          169000   36117 213  1968400
37 2325  4 MIDLAND-GLAD.-AREN.-ROSC., MI        109400   26068 245  2077800
37 2326  5 MECOSTA-OSC.-WEX.-MISS.-CLARE, MI    101400   21162 208  2179200
37 2330  6 CHIPPEWA & 5, MI(SAULT STE MARIE)    111500   26227 235  2290700
37 2328  7 GRAND TRAVERSE & 6, MI(TRAV. CITY    111700   27542 246  2402400
37 3005  2 OTTAWA-SANDUSKY, OH(NORTH)           100300   21406 213  2502700
37 3023  3 AUGLAIZE-SHELBY-LOGAN, OH(WEST)      117300   22386 190  2620000
37 3001  3 FULTON-HENRY-WILLIAMS, OH(NW)         98700   19196 194  2718700
37 5016  4 WOOD & 3, WI(CEN)                    109200   21574 197  2827900
37 5026  4 ST. CROIX & 3, WI(WEST)              105600   22167 209  2933500
37 5027  5 BARRON & 4, WI(NW)                   104300   20409 195  3037800
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37	5024	6	ONEIDA & 5, WI(NORTH)	99500	22948	230	3137300
41	WEST NORTH CENTRAL, LARGE URBAN PSUS						
41	1710	1	SEDGEWICK, KS(WICHITA)	340700	61091	179	340700
41	2409	1	HENNEPIN, MN(MINNEAPOLIS)	924800	160659	173	1265500
41	2412	1	RAMSEY, MN(ST. PAUL)	461700	80070	173	1727200
41	2626	1	JACKSON, MO(KANSAS CITY)	647900	123376	191	2375100
41	2610	1	ST. LOUIS CITY, MO	534000	82158	153	2909100
41	2808	1	DOUGLAS, NE(OMAHA)	414500	68037	164	3323600
42	WEST NORTH CENTRAL, SMALL URBAN PSUS						
42	1516	1	POLK, IA(DES MOINES)	297600	68067	228	297600
42	1607	1	LINN, IA(CEDAR RAPIDS)	164600	32721	198	462200
42	1622	1	SCOTT, IA(DAVENPORT)	147400	36569	248	609600
42	1608	1	BLACK HAWK, IA(WATERLOO)	132400	25504	192	742000
42	1613	1	WOODBURY, IA(SIOUX CITY)	103800	18801	181	845800
42	1605	2	DUBUQUE-DELAWARE, IA	110400	18816	170	956200
42	1705	1	SHAWNEE, KS(TOPEKA)	152200	32065	210	1108400
42	2408	1	STEARNS, MN(ST. CLOUD)	100700	17423	173	1209100
42	2421	2	OLMSTED & 1, MN(ROCHESTER)	102100	16918	165	1311200
42	2413	3	ST. LOUIS & 2, MN(DULUTH)	233500	41163	176	1544700
42	2623	1	GREENE, MO(SPRINGFIELD)	168200	29130	173	1712900
42	2603	2	BUCHANAN-PLATTE, MO(ST. JOSEPH)	123500	18777	152	1836400
42	2612	2	BOONE-CALLAWAY, MO(COLUMBIA)	113300	25128	221	1949700
42	2809	1	LANCASTER, NE(LINCOLN)	182200	30159	165	2131900
42	3506	4	CASS & 3, ND(FARGO)	110400	19791	179	2242300
42	4206	2	MINNEHAHA-LINCOLN, SD(SIOUX FALLS	110600	24646	222	2352900
43	WEST NORTH CENTRAL, LARGE SUBURBAN PSUS						
43	1707	1	JOHNSON, KS(K.C. METRO)	232300	40325	173	232300
43	2609	1	ST. LOUIS COUNTY, MO	967200	172936	178	1199500
44	WEST NORTH CENTRAL, SMALL SUBURBAN PSUS						
44	1614	2	POTTAWATTAMIE-HARRISON, IA(WEST)	103500	24436	236	103500
44	1706	1	WYANDOTTE, KS(K.C. METRO)	185600	34090	183	289100
44	2411	1	ANOKA, MN (MINN. METRO)	180300	24135	133	469400
44	2414	1	DAKOTA, MN(MINN. METRO)	167100	27184	162	636500
44	2413	1	WASHINGTON, MN(MINN. METRO)	99700	15313	154	736200
44	2415	4	SCOTT & 3, MN(MINN. METRO)	114900	22594	[illegible]	851100
44	2416	4	WRIGHT & 3, MN(MINN. METRO)	114700	24071	209	965800
44	2625	1	CLAY, MO(K.C. METRO)	132900	28494	214	1098700
44	2611	1	JEFFERSON, MO(S.L. METRO)	119400	19153	160	1218100
44	2606	1	ST. CHARLES, MO(S.L. METRO)	109600	28736	262	1327700
44	2614	3	CASS-JOHNSON-HENRY, MO(K.C. METRO	102300	16425	161	1430000
44	2607	4	FRANKLIN & 3, MO(S.L. METRO)	107600	24426	227	1537600
44	2810	3	SARPY & 2, NE(EAST)	111300	17965	161	1648900
45	WEST NORTH CENTRAL, RURAL LOW GAS SALES PSUS						
45	1708	3	DOUGLAS-FRANKLIN-MIAMI, KS(EAST)	104200	14929	143	104200
45	2613	6	COLE & 5, MO(CEN)	107400	14921	138	211600
46	WEST NORTH CENTRAL, RURAL AVERAGE GAS SALES PSUS						
46	1620	3	LEE-DES MOINES-LOUISA, IA(SE)	99900	18137	181	99900
46	1606	4	CLINTON & 3, IA(EAST)	115800	21354	184	215700
46	1604	5	FAYETTE & 4, IA(NE)	105800	15726	148	321500
46	1603	6	FLOYD & 5, IA(NORTH)	100200	17579	175	421700
46	1715	3	RENO-RICE-HARVEY, KS(CEN)	101500	16700	164	523200
46	1703	4	RILEY & 3, KS(NE)	110700	20488	185	633900
46	1704	5	LEAVENWORTH & 4, KS(NE)	108200	16535	152	742100
46	1709	6	CRAWFORD & 5, KS(EAST)	104400	18345	175	846500
46	2418	3	BLUE EARTH & 2, MN(SOUTH)	106500	18538	174	953000
46	2422	3	WINONA & 2, MN(SE)	101500	15367	151	1054500
46	2420	4	MOWER & 3, MN(SE)	121700	21518	176	1176200
46	2419	4	RICE & 3, MN(SOUTH)	112500	20286	180	1288700
46	2417	7	MARTIN & 6, MN(SW)	123700	20677	167	1412400
46	2416	8	LYON & 7, MN(SW)	124000	21455	172	1536400

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46 2022  6 BARRY & 5, MO(SE)                      113100   17715 156  1649500
46 2020  8 BUTLER & 7, MO(SE)                     114300   20331 177  1763800
46 2021  8 HOWELL & 7, MO(SOUTH)                  110700   17760 160  1874500
46 2015  9 VERNON & 8, MO(WEST)                   107600   17014 158  1982100
46 3005  5 GRAND FORKS & 4, ND(NE)                105700   19331 182  2087800
46 3003  7 WARD & 6, ND(NORTH)                    102000   19006 186  2189800
46 4201  7 PENNINGTON & 6, SD(WEST)               131900   24332 184  2321700
46 4204 10 BROOKINGS & 9, SD(EAST)                106800   18630 174  2428500
47 WEST NORTH CENTRAL, RURAL HIGH GAS SALES PSUS
47 1021  2 JOHNSON-MUSCATINE, IA(EAST)            112500   24761 220   112500
47 1010  3 BOONE-STORY-HARDIN, IA(CEN)            114300   23627 206   226800
47 1009  4 MARSHALL & 3, IA(CEN)                   99700   20749 208   326500
47 1018  5 JASPER & 4, IA(EC)                     107100   26751 249   433600
47 1002  6 CERRO GORDO & 5, IA(NORTH)             121400   23217 191   555000
47 1011  6 WEBSTER & 5, IA(NORTH)                 119500   26276 219   674500
47 1019  6 WAPELLO & 5, IA(SE)                    110200   20771 166   784700
47 1012  7 PLYMOUTH & 6, IA(WEST)                 115900   25763 222   900600
47 1001  8 SIOUX & 7, IA(NW)                      127300   28353 222  1027900
47 1023  8 DALLAS & 7, IA(WC)                     121800   27168 223  1149700
47 1017  8 WARREN & 7, IA(SOUTH)                  118200   22983 194  1267900
47 1015  9 PAGE & 8, IA(SW)                       105300   24896 236  1373200
47 1713  4 SALINE & 3, KS(NC)                     107900   27506 254  1481100
47 1711  5 MONTGOMERY & 4, KS(SE)                 101700   19466 191  1582800
47 1712  7 LYON & 6, KS(EC)                       112200   26225 233  1695000
47 1716  8 SUMNER & 7, KS(SOUTH)                   99000   20787 209  1794000
47 1714 10 BARTON & 9, KS(WC)                     101700   24614 242  1895700
47 1702 12 CLOUD & 11, KS(NORTH)                  108600   28701 264  2004300
47 1701 15 ELLIS & 14, KS(NW)                     108000   29143 269  2112300
47 1717 19 FINNEY & 18, KS(SW)                    100800   24004 238  2213100
47 2404  4 CLAY & 3, MN(WEST)                     130500   28132 215  2343600
47 2405  5 CROW WING & 4, MN(NC)                  116300   28291 243  2459900
47 2406  6 CARLTON & 5, MN(EAST)                  117400   25392 216  2577300
47 2402  7 BELTRAMI & 6, MN(NORTH)                129400   30059 232  2706700
47 2401  8 POLK & 7, MN(NW)                       104600   25466 243  2811300
47 2407  9 KANDIYOHI & 8, MN(WEST)                129900   25961 199  2941200
47 2624  2 JASPER-NEWTON, MO(SW)                  120500   25123 208  3061700
47 2618  3 CAPE GIRARDEAU & 2, MO(EAST)           102300   19520 190  3164000
47 2619  4 PEMISCOT & 3, MO(SE)                   102800   21590 210  3266800
47 2616  5 PULASKI & 4, MO(SC)                    110900   22595 203  3377700
47 2617  6 ST. FRANCIS & 5, MO(EAST)              127300   27171 213  3505000
47 2605  6 PETTIS & 5, MO(WC)                     118400   24017 202  3623400
47 2604  6 LAFAYETTE & 5, MO(WEST)                 97900   19718 201  3721300
47 2606  7 MARION & 6, MO(EAST)                   107200   25243 235  3828500
47 2602 10 ADAIR & 9, MO(NE)                      104400   20921 200  3932900
47 2601 11 NODAWAY & 10, MO(NW)                   106600   24813 232  4039500
47 2805  5 HALL & 4, NE(CEN)                      107200   34414 321  4146700
47 2807  7 DODGE & 6, NE(NE)                      101400   22803 224  4248100
47 2811  9 GAGE & 8, NE(SE)                       108400   20402 188  4356500
47 2803 11 MADISON & 10, NE(NC)                   104600   20860 199  4461100
47 2821 11 SCOTTS BLUFF & 10, NE(WEST)             93600   23724 253  4554700
47 2806 12 ADAMS & 11, NE(SOUTH)                  101900   24023 235  4656600
47 2804 14 PLATTE + 13, NE(CEN)                   111100   27583 248  4767700
47 2802 19 LINCOLN & 18, NE(WC)                   106300   32054 301  4874000
47 3502 10 BURLEIGH & 9, ND(SC)                   102100   19677 192  4976100
47 3504 11 RAMSEY & 10, ND(EC)                    107000   21645 202  5083100
47 3501 16 STARK & 15, ND(WEST)                   110200   24091 218  5193300
47 4203  9 BROWN & 8, SD(NORTH)                   104400   20936 200  5297700
47 4205 15 YANKTON & 14, SD(SE)                   126700   28815 227  5424400
47 4202 24 HUGHES & 23, SD(CEN)                   102100   25125 246  5526500
51 SOUTH ATLANTIC, LARGE URBAN PSUS
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51  801  1 NEW CASTLE, DL(WILMINGTON)             395300    69680 176    395300
51  901  1 WASHINGTON, DC                          722700    96272 133   1118000
51 1028  1 BROWARD, FL(FORT LAUDERDALE)            806800   123320 152   1924800
51 1021  1 PINELLAS, FL(ST. PETERSBURG)            640100    86952 135   2564900
51 1020  1 HILLSBOROUGH, FL(TAMPA)                 570800    88421 154   3135700
51 1008  1 DUVAL, FL(JACKSONVILLE)                 551400    98541 178   3687100
51 1027  1 PALM BEACH, FL(W. PALM BEACH)           443600    67212 151   4130700
51 1015  1 ORANGE, FL(ORLANDO)                     410200    84891 206   4540900
51 1029  2 DADE-MONROE, FL(MIAMI)                 1468700   226703 154   6009600
51 1110  1 FULTON, GA(ATLANTA)                     580200   122801 211   6589800
51 2108  1 BALTIMORE CITY, MD                      864100    94516 109   7453900
51 3406  1 MECKLENBURG, NC(CHARLOTTE)              373700    66509 177   7827600
51 3414  1 GUILFORD, NC(GREENSBORO)                299200    58547 195   8126800
51 4721  2 NORFOLK-VIRGINIA BEACH, VA              498400    59410 119   8625200
51 4725  2 RICHMOND-HENRICO, VA                    399300    69257 173   9024500
52 SOUTH ATLANTIC, SMALL URBAN PSUS
52 1018  1 POLK, FL(LAKELAND)                      263200    44376 168    263200
52 1016  1 BREVARD, FL (MELBOURNE)                 229400    43897 191    492600
52 1001  1 ESCAMBIA, FL(PENSACOLA)                 217800    31356 143    710400
52 1012  1 VOLUSIA, FL(DAYTONA BEACH)              199600    39108 135    910000
52 1023  1 SARASOTA, FL                            158900    26238 165   1068900
52 1026  1 LEE, FL(FORT MYERS)                     154100    23749 154   1223000
52 1004  1 LEON, FL(TALLAHASSEE)                   124100    21079 169   1347100
52 1010  1 ALACHUA, FL(GAINESVILLE)                124000    29133 234   1471100
52 1120  1 CHATHAM, GA(SAVANNAH)                   175600    35427 201   1646700
52 1126  1 COLUMBUS, GA                            156900    30198 192   1803600
52 1118  1 RICHMOND, GA(AUGUSTA)                   153900    24993 162   1957500
52 1123  1 BIBB, GA(MACON)                         143100    35355 247   2100600
52 1127  2 DOUGHERTY-LEE, GA(ALBANY)               100700    17775 176   2201300
52 3422  1 WAKE, NC(RALEIGH)                       256600    40088 156   2457900
52 3409  1 FORSYTH, NC(WINSTON-SALEM)              223200    32297 144   2681100
52 3424  1 CUMBERLAND, NC(FAYETTEVILLE)            223100    31421 140   2904200
52 3405  1 GASTON, NC(GASTONIA)                    155300    20137 129   3059500
52 3420  1 DURHAM, NC                              138900    24787 178   3198400
52 3418  1 ALAMANCE, NC(BURLINGTON)                 99400    15574 156   3297800
52 3402  2 BUNCOMBE-MADISON, NC(ASHEVILLE)         166400    28643 172   3464200
52 3426  2 NEW HANOVER & 1, NC(WILMINGTON)         127000    20144 158   3591200
52 4102  1 GREENVILLE, SC                          265300    44761 168   3856500
52 4109  1 CHARLESTON, SC                          260000    38962 149   4116500
52 4108  1 RICHLAND, SC(COLUMBIA)                  249300    42755 171   4365800
52 4719  2 NEWPORT NEWS-HAMPTON, VA                263200    34486 130   4629000
52 4722  2 PORTSMOUTH-CHESAPEAKE, VA               210300    24893 118   4839300
52 4720  3 LYNCHBURG & 2, VA                       131000    21679 165   4970300
52 4706  4 ROANOKE & 3, VA                         192000    29434 153   5162300
52 4724  5 PETERSBURG & 4, VA                      124300    21305 171   5286600
52 4902  1 KANAWHA, WV(CHARLESTON)                 223700    39791 177   5510300
52 4901  1 CABELL, WV(HUNTINGTON)                  105700    17057 161   5616000
52 4915  3 OHIO & 2, WV(WHEELING)                  132400    24041 166   5748400
52 4909  4 WOOD & 3, WV(PARKERSBURG)               108700    15747 144   5857100
53 SOUTH ATLANTIC, LARGE SUBURBAN PSUS
53 1108  1 DE KALB, GA(NORTH)                      457000    83314 183    457000
53 1109  1 COBB, GA(NORTH)                         234100    49710 212    691100
53 2106  1 PRINCE GEORGE'S, MD(WASH. METRO)        679200   125169 185   1370300
53 2109  1 BALTIMORE COUNTY, MD                    632500   115344 182   2002800
53 2105  1 MONTGOMERY, MD(WASH. METRO)             560300   103922 185   2563100
53 2107  1 ANNE ARUNDEL, MD(BALT. METRO)           337100    61055 181   2900200
53 4716  2 ARLINGTON-ALEXANDRIA, VA(WASH. M)       261500    34739 130   3161700
53 4715  3 FAIRFAX & 2, VA(WASH. METRO)            548600   117290 213   3710300
54 SOUTH ATLANTIC, SMALL SUBURBAN PSUS
54 1014  1 SEMINOLE, FL(ORL)                       130900    17809 136    130900
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54 1019  1 PASCO, FL(WEST)                       122000   12779 104   252000
54 1029  4 CLAY & 3, FL(NE)                      133000   25562 191   386000
54 1113  1 CLAYTON, GA(NC)                       127900   26821 209   514400
54 1107  1 GWINNETT, GA(NORTH)                   108400   18354 169   622800
54 1111  4 DOUGLAS & 3, GA(WEST)                 135100   17242 127   757900
54 1101  4 WALKER & 3, GA(NW)                    118800   15108 127   876700
54 1124  4 HOUSTON & 3, GA(CEN)                  102600   16120 157   979300
54 1115  5 NEWTON & 4, GA(CEN)                   127300   20506 161  1106600
54 1103  7 CHEROKEE & 6, GA(NORTH)               135400   22220 164  1242000
54 2110  2 HARFORD-CECIL, MD(BALT-WIL METRO)     190500   31599 166  1432500
54 2104  2 CARROLL-HOWARD, MD(BALT. METRO)       172500   27093 157  1605000
54 2113  3 CHARLES & 2, MD(WASH. METRO)          135300   23230 172  1740300
54 3408  1 DAVIDSON, NC(GREENSBORO METRO)        100600   13400 133  1840900
54 3416  2 UNION-STANLY, NC(CHARLOTTE MET)       105100   13210 125  1946000
54 3415  2 RANDOLPH-MONTGOMERY, NC(GREENS M)     102000   12921 126  2048000
54 3419  2 ORANGE-CHATHAM, NC(DUR. METRO)         96500   11328 117  2144500
54 4104  1 SPARTANBURG, SC(GREEN. METRO)         189600   30375 162  2334100
54 4107  1 LEXINGTON, SC(COLUMBIA METRO)         111500   15729 141  2445600
54 4106  2 AIKEN-BARNWELL, SC(AUGUSTA METRO)     112600   14948 132  2558200
54 4101  2 PICKENS-OCONEE, SC(GREEN. METRO)      110800   13348 120  2669000
54 4120  2 BERKELEY-DORCHESTER, SC(CHAR. MET     102100   10176  99  2771100
54 4714  1 PRINCE WILLIAM, VA(WASH. METRO)       138000   23862 172  2909100
54 4726  3 CHESTERFIELD & 2, VA(RICH. METRO)     119600   18932 158  3028700
54 4713  4 LOUDON & 3, VA(WASH. METRO)           100500   16155 180  3129200
54 4723  6 SUFFOLK & 5, VA(PORT. METRO)          109600   15344 145  3238800
54 4718  8 YORK & 7, VA(N. NEWS METRO)           111400   15350 142  3350200
55 SOUTH ATLANTIC, RURAL LOW GAS SALES PSUS
55 1002  2 OKALOOSA-SANTA ROSA, FL(NW)           142700   19201 134   142700
55 1132  2 FLOYD-POLK, GA(NW)                    109100   15243 139   251800
55 1112  5 TROUP & 4, GA(WEST)                   119700   16003 133   371500
55 1116  9 BALDWIN & 8, GA(CEN)                  118700   17248 145   490200
55 1105  9 HABERSHAM & 8, GA(NE)                 110600   16019 144   600800
55 1117  9 MC DUFFIE & 8, GA(EAST)               105000   13947 132   705800
55 1128  9 DECATUR & 8, GA(SW)                   104800   12910 123   810600
55 1122  9 LAURENS & 8, GA(CEN)                  104500   13702 131   915100
55 1125 13 SUMTER & 12, GA(WC)                   120000   16686 140  1035100
55 3437  2 ROWAN-CABARRUS, NC(CEN)               170100   25156 147  1205200
55 3407  2 CATAWBA-LINCOLN, NC(WC)               135000   16730 138  1340200
55 3428  2 NASH-EDGECOMBE, NC(EC)                115800   16978 146  1455800
55 3432  2 ONSLOW-JONES, NC(SE)                  104700   12365 116  1560700
55 3430  2 WAYNE-GREENE, NC(EC)                  104400   14335 142  1665100
55 3413  2 ROCKINGHAM-STOKES, NC(NORTH)          104300   13136 125  1769400
55 3425  3 ROBESON & 2, NC(SOUTH)                168300   23247 138  1937700
55 3410  3 IREDELL & 2, NC(WC)                   159400   18704 117  2097100
55 3431  3 SAMPSON & 2, NC(SOUTH)                105800   11165 105  2202900
55 3412  3 SURRY & 2, NC(NW)                     101000   12595 124  2303900
55 3421  4 GRANVILLE & 3, NC(NORTH)              112600   15206 135  2416500
55 3411  4 WILKES & 3, NC(NW)                    111000   12830 115  2527500
55 3417  4 RICHMOND & 3, NC(SOUTH)               109700   13717 125  2637200
55 3403  5 RUTHERFORD & 4, NC(SW)                207500   27607 133  2844700
55 3404  5 BURKE & 4, NC(WEST)                   137600   18340 133  2982300
55 3435  7 BEAUFORT & 6, NC(EAST)                114100   14642 128  3096400
55 4105  2 YORK-CHEROKEE, SC(NORTH)              132300   18787 142  3228700
55 4114  2 SUMTER-LEE, SC(CEN)                    99600   12730 127  3328300
55 4113  3 DARLINGTON & 2, SC(NORTH)             119600   15164 126  3447900
55 4111  3 LAURENS & 2, SC(WEST)                 110200   15376 139  3558100
55 4112  4 LANCASTER & 3, SC(NORTH)              131600   16178 122  3689700
55 4110  5 GREENWOOD & 4, SC(WEST)               112600   14762 131  3802300
55 4707  2 DANVILLE-PITTSYLVANIA, VA(SOUTH)      108300   12730 117  3910600
55 4702  3 TAZEWELL & 2, VA(SW)                  102600   11346 110  4013200
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55 4705  4 MONTGOMERY & 3, VA(SW)                114500    16731 146   4127700
55 4701  5 WISE & 4, VA(SW)                      108200    13528 125   4235900
55 4704  8 HENRY & 7, VA(SW)                     174300    24534 140   4410200
55 4727  9 LOUISA & 8, VA(CEN)                   101500    13562 133   4511700
55 4906  2 FAYETTE-RALEIGH, WV(SC)               128000    16922 132   4639700
55 4914  3 MARION & 2, WV(NORTH)                 122900    16408 133   4762600
55 4904  3 MCDOWELL & 2, WV(SW)                  115800    13178 113   4878400
55 4913  3 MONONGALIA & 2, WV(NORTH)             110500    13956 126   4988900
55 4903  4 LOGAN & 3, WV(WEST)                   131700    16467 125   5120600
55 4912  4 HARRISON & 3, WV(NC)                  106500    13762 129   5227100
55 4908  7 NICHOLAS & 6, WV(CEN)                 103800    13726 132   5330900
55 4910  8 RANDOLPH & 7, WV(EAST)                104700    14933 143   5435600
56 SOUTH ATLANTIC, RURAL AVERAGE GAS SALES PSUS
56  802  2 KENT-SUSSEX, DE                       177300    30204 170    177300
56 1022  1 MANATEE, FL(WEST)                     118800    18725 157    296100
56 1005  3 BAY-GULF-FRANKLIN, FL(NW)             101100    15024 148    397200
56 1025  5 COLLIER & 4, FL(SW)                   133200    24511 184    530400
56 1003  7 JACKSON & 6, FL(NW)                   126700    20978 165    657100
56 1104  4 HALL & 3, GA(NORTH)                   116000    17708 152    773100
56 1129  4 COLQUITT & 3, GA(SOUTH)               102800    19263 187    875900
56 1106  5 CLARKE & 4, GA(NC)                    122300    20152 164    998200
56 1114  6 SPALDING & 5, GA(CEN)                 116100    18227 156   1114300
56 1131  7 GLYNN & 6, GA(SE)                     131200    22060 168   1245500
56 1119  7 BULLOCH & 6, GA(EAST)                 103700    15851 152   1349200
56 2101  2 ALLEGANY-GARRETT, MD(NW)              106800    16825 157   1456000
56 2111  5 DORCHESTER & 4, MD(EAST)              111600    20416 182   1567600
56 3434  2 PITT-LENOIR, NC(EAST)                 133300    19606 148   1700900
56 3423  3 HARNETT-MOORE-LEE, NC(CEN)            128100    20192 157   1829000
56 3433  3 CRAVEN & 2, NC(EAST)                  109300    16275 148   1938300
56 3427  3 HALIFAX & 2, NC(NORTH)                 99300    16540 166   2037600
56 3401  7 HAYWOOD & 6, NC(SW)                   123600    21622 174   2161200
56 3436  8 RUTHERFORD & 7, NC(WE)                117400    18236 155   2278600
56 4116  2 HORRY-MARION, SC(NE)                  116100    19905 171   2394700
56 4118  3 ORANGEBURG & 2, SC(CEN)               103300    18312 177   2498000
56 4119  5 COLLETON & 4, SC(SOUTH)               121000    18975 156   2619000
56 4711  4 CHARLOTTESVILLE & 3, VA(NC)           101000    16173 160   2720000
56 4703  5 WASHINGTON & 4, VA(SW)                120100    21393 178   2840100
56 4709  5 AUGUSTA & 4, VA(WEST)                 102100    17140 167   2942200
56 4905  4 MERCER & 3, WV(SOUTH)                 123800    20923 169   3066000
56 4911  5 BERKELEY + 4, WV-VA((NE)              118800    20517 172   3184800
56 4907  5 PUTNAM & 4, WV(WEST)                  100000    16859 168   3284800
57 SOUTH ATLANTIC, RURAL HIGH GAS SALES PSUS
57 1011  1 MARION, FL(NC)                         96000    22522 234     96000
57 1017  3 ST. LUCIE-OSCEOLA-IND.R., FL(EAST 144800    30374 213    240800
57 1013  3 LAKE-SUMTER-HERNANDO, FL(CEN)         133400    28622 214    374200
57 1024  4 HIGHLANDS & 3, FL(SC)                 113200    22571 199    487400
57 1007  6 COLUMBIA & 5, FL(NE)                   99100    30225 304    586500
57 1006 10 SUWANNEE & 9, FL(NORTH)               132000    26760 202    718500
57 1102  3 WHITFIELD-MURRAY-GORDON, GA(NW)       105200    21418 203    823700
57 1133  7 TIFT & 6, GA(SC)                      112100    27357 244    935800
57 1130  7 LOWNDES & 6, GA(SOUTH)                105900    23489 221   1041700
57 1121  9 WAYNE & 8, GA(SE)                     117100    22179 189   1158800
57 2102  1 WASHINGTON, MD((NW)                   106400    20532 192   1265200
57 2103  1 FREDERICK, MD(NORTH)                   94300    22384 237   1359500
57 2112  5 WICOMICO & 4, MD-VA(SE)               148100    28778 194   1507600
57 3429  2 WILSON-JOHNSON, NC(EC)                123400    24165 195   1631000
57 4103  1 ANDERSON, SC(NW)                      113600    22435 197   1744600
57 4115  2 FLORENCE-DILLON, SC(NE)               126200    23790 188   1870800
57 4117  3 WILLIAMSBURG & 2, SC(EAST)             97200    19162 197   1968000
57 4710  4 ROCKINGHAM & 3, VA(NORTH)             112600    23444 208   2080600
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57 4712  6 FREDERICKSBURG & 5, VA(NC)           107300   26616 248  2187900
57 4726  7 MECKLENBURG & 6, VA(SOUTH)           109100   21608 198  2297000
57 4717 10 HANOVER & 9, VA(NC)                  129600   35200 271  2426600
57 4708 10 BEDFORD & 9, VA(WEST)                117700   26434 224  2544300
61 EAST SOUTH CENTRAL, LARGE URBAN PSUS
61  108  1 JEFFERSON, AL(BIRMINGHAM)            641900   92193 143   641900
61  123  1 MOBILE, AL                           330600   42423 128   972500
61 1607  1 JEFFERSON, KY(LOUISVILLE)            706000  110835 156  1678500
61 4301  1 SHELBY, TN(MEMPHIS)                  724400  114541 158  2402900
61 4309  1 DAVIDSON, TN(NASHVILLE)              449700   85872 190  2852600
62 EAST SOUTH CENTRAL, SMALL URBAN PSUS
62  103  1 MADISON, AL(HUNTSVILLE)              184800   20310 109   184800
62  118  1 MONTGOMERY, AL                       182900   33348 185   367700
62  111  1 TUSCALOOSA, AL                       122500   16609 135   490200
62  106  1 CALHOUN, AL(ANNISTON)                105900   14368 141   596100
62  101  2 LAUDERDALE-COLBERT, AL(FLORENCE)     120900   14650 122   717000
62  105  2 ETOWAH-CHEROKEE, AL(GADSEN)          112000   14163 126   829000
62 1609  1 FAYETTE, KY(LEXINGTON)               186900   30499 135  1015900
62 1613  2 DAVIESS-HENDERSON, KY(OWENSBORO)     117800   18056 153  1133700
62 2511  1 HINDS, MS(JACKSON)                   224100   37387 169  1357800
62 2519  2 HARRISON-HANCOCK, MS(BILOXI)         164500   23555 143  1522300
62 2520  2 JACKSON & 1, MS(PASCAGOULA)          117900   13342 113  1640200
62 4320  1 KNOX, TN(KNOXVILLE)                  287300   53208 185  1927500
62 4317  1 HAMILTON, TN(CHATTANOOGA)            264800   51554 194  2192300
62 4325  1 SULLIVAN, TN(KINGSPORT)              132300   13332 138  2324600
62 4310  5 MONTGOMERY & 4, TN(CLARKSVILLE)      127900   17529 133  2452500
63 EAST SOUTH CENTRAL, LARGE SUBURBAN PSUS
64  122  2 BALDWIN-ESCAMBIA, AL(SW)             102000   21523 211   102000
64 EAST SOUTH CENTRAL, SMALL SUBURBAN PSUS
64  109  3 WALKER-LAWRENCE-WINSTON, AL          110600   14052 127   212600
64  115  4 ELMORE-AUT-COOSA-TALLAP, AL          111800   12144 108   324400
64  119  4 RUSSELL-BULL-BARB-PIKE, AL(SE)       106700   12604 116   431100
64 1611  1 KENTON, KY(CINCI. METRO)             130400   22997 176   561500
64 1614  3 BOYD & 2, KY(HUNT. METRO)            107200   15140 141   668700
64 1612  3 CAMPBELL & 2, KY(CINCI METRO)        103300   12411 120   772000
64 1624  4 CHRISTIAN & 3, KY(CLARKS. METRO)     130100   15511 149   902100
64 1608  5 FRANKLIN & 4, KY(LEX. METRO)         103900   20364 196  1006000
64 1610  8 BOONE & 7, KY(NORTH)                 101400   30733 303  1107400
64 2512  3 RANKIN-MADISON-LEAKE, MS(CEN)        104100   14627 140  1211500
64 2501  4 DE SOTO & 3, MS(NW)                  108100   11636 107  1319600
64 4312  2 RUTHERFORD-WILSON, TN(NASH. MET)     109800   19636 178  1429400
64 4319  2 BLOUNT-SEVIER, TN(KNOX. METRO)       101300   15334 156  1530700
64 4311  2 SUMNER-ROBERTSON, TN(NASH. METRO)    100000   14755 147  1630700
64 4308  3 WILLIAMSON & 2, TN(NASH. METRO)      102000   17359 17[illegible]  1732700
64 4321  3 ANDERSON & 2, TN(KNOX. METRO)        100900   17115 169  1833600
65 EAST SOUTH CENTRAL, RURAL LOW GAS SALES PSUS
65  104  3 MARSHALL-JACKSON-DEKALB, AL          148900   14641  98   148900
65  114  3 LEE-CHAMBERS-MACON, AL               128500   14149 110   277400
65  107  3 CULLMAN-BLOUNT-ST. CLAIR, AL         120700   15171 123   398100
65  113  4 TALLADEGA-CLAY-RAND-CLEB, AL         110900   12763 115   509000
65  117  4 DALLAS-WIL-MON-LOWN, AL(SELMA)       105800   12570 116   614800
65  112  5 SHELBY-BIBB-HALE-PERRY-CHIL, AL      119000   15241 128   733800
65  110  5 FRANK-MAR-LAM-FAY-PIC, AL            106400    9176  86   840200
65  121  6 COVINGTON & 5, AL (SC)               144200   14112 132   984400
65  116  6 MARENGO & 5, AL(SW)                  110100   14797 134  1094500
65 1616  2 PIKE-FLOYD, KY(EAST)                 104000   11539 112  1198500
65 1617  5 HARLAN & 4, KY(SE)                   120300   13455 108  1318800
65 1620  6 BOYLE & 5, KY(CEN)                   105000   15403 147  1423800
65 1604  6 MUHLENBERG & 5, KY(WEST)              99700   13373 139  1523500
65 1621  7 PULASKI & 6, KY(SOUTH)               110600   14547 131  1634100
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65 1613  9 CLARK & 8, KY(NE)                        118700   16583 139  1753000
65 1615 12 JOHNSON & 11, KY(EAST)                   114200   11204  98  1867200
65 2506  2 WASHINGTON-SUNFLOWER, MS(WEST)           106500   11651 109  1973700
65 2509  3 LOWNDES & 2, MS(EAST)                    108300   12193 112  2082000
65 2503  3 COAHOMA & 2, MS(NW)                      101500   10778 106  2183500
65 2515  4 JONES & 3, MS(SE)                        103300   12327 119  2286800
65 2518  5 ADAMS & 4, MS(SW)                        106100   12150 114  2392900
65 2507  5 LEFLORE & 4, MS(NC)                      106000   15169 143  2498900
65 2504  5 LAFAYETTE & 4, MS(NORTH)                 100800   12201 121  2599700
65 2502  6 ALCORN & 5, MS(NE)                       111500   16103 144  2711200
65 2514  6 SCOTT & 5, MS(CEN)                       109400   12304 112  2820600
65 2510  6 WARREN & 5, MS(WEST)                     106800   13881 129  2927400
65 2517  6 PIKE & 5, MS(SW)                         104800   10972 104  3032200
65 2508  6 OKTIBBEHA & 5, MS(EC)                    100700   12851 127  3132900
65 4323  3 GREENE-COCKE-JEFFERSON, TN(NE)           104500   13221 126  3237400
65 4324  4 WASHINGTON & 3, TN(NE)                   153400   19375 126  3390800
65 4302  4 TIPTON & 3, TN(SW)                        98300   12763 129  3489100
65 4316  5 BRADLEY & 4, TN(SE)                      139900   20528 146  3629000
65 4322  5 HAMBLEN & 4, TN(NE)                      122500   17260 140  3752000
65 4304  5 DYER & 4, TN(NE)                         108200   15154 140  3860200
65 4307  5 LAWRENCE & 4, TN(SC)                     105900   15208 143  3966100
65 4314  8 WARREN & 7, TN(CEN)                      107700   12638 117  4073800
65 4315  9 PUTNAM & 8, TN(NC)                       119300   16544 138  4193100
66 EAST SOUTH CENTRAL, RURAL AVERAGE GAS SALES PSUS
66  102  2 LIMESTONE-MORGAN, AL                     124700   19663 157   124700
66  120  3 HOUSTON-DALE-HENRY, AL(DOTHAN)           125300   18923 151   250000
66 1618  5 BELL & 4, KY(SOUTH)                      135700   24712 182   385700
66 1619  6 MADISON & 5, KY(CEN)                     112700   20427 181   498400
66 1606  6 BULLITT & 5, KY(NC)                      101800   16671 163   600200
66 1602  7 MC CRACKEN & 6, KY(WEST)                 125900   20992 166   726100
66 1601  7 GRAVES & 6, KY(SW)                       112400   17314 154   838500
66 1622  7 BARREN & 6, KY (SOUTH)                    98500   15161 153   937000
66 2513  3 LAUDERDALE & 2, MS(EAST)                 103300   16477 159  1040300
66 2505  4 LEE & 3, MS(NE)                          103400   15367 148  1143700
66 2516  6 FORREST & 5, MS(SE)                      132800   21800 164  1276500
66 4305  3 GIBSON-WEAKLEY-HENRY, TN(NE)             104000   16172 155  1380500
66 4303  3 MADISON & 2, TN(SW)                      100000   17815 178  1480500
66 4310  5 ROANE & 4, TN(EC)                        120200   19413 161  1600700
66 4313  6 COFFEE & 5, TN(SC)                       124900   20222 161  1725600
66 4306  8 CARROLL & 7, TN(WC)                      119500   21932 183  1845100
67 EAST SOUTH CENTRAL, RURAL HIGH GAS SALES PSUS
67 1605  3 HARDIN-MEADE-LARUE, KY(NC)               102500   22044 215   102500
67 1623  4 WARREN & 3, KY(SW)                       107900   24023 222   210400
71 WEST SOUTH CENTRAL, LARGE URBAN PSUS
71  409  1 PULASKI, AR(LITTLE ROCK)                 313000   56683 181   313000
71 1922  1 ORLEANS, LA(NEW ORLEANS)                 567300   63353 111   880300
71 1916  1 EAST BATON ROUGE, LA(BATON ROUGE)        309000   43627 141  1189300
71 3702  1 OKLAHOMA, OK(OKLAHOMA CITY)              551000   83237 151  1740300
71 3703  1 TULSA, OK                                415600   69858 168  2155900
71 4458  1 HARRIS, TX(HOUSTON)                     1899800  297667 156  4055700
71 4406  1 DALLAS, TX                              1376300  235477 171  5432000
71 4411  1 BEXAR, TX(SAN ANTONIO)                   911700  117864 129  6343700
71 4405  1 TARRANT, TX(FORT WORTH)                  721600  126113 174  7065300
71 4401  1 EL PASO, TX                              410000   51284 125  7475300
71 4416  1 TRAVIS, TX(AUSTIN)                       353500   52238 147  7828800
72 WEST SOUTH CENTRAL, SMALL URBAN PSUS
72  401  2 BENTON-WASH, AR(FAYETTEVILLE)            144900   21582 148   144900
72  408  2 SEBASTIAN-CRAW, AR(FT SMITH)             113200   18919 167   258100
72  411  2 JEFF-ARK,AR(PINE BLUFF)                  107500   15623 145   365600
72  415  6 MILLER & 5, AR(TEXARKANA)                104400   19067 182   470000
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72 1901  1 CADDO, LA(SHREVEPORT)                 230900   32344 136   706900
72 1904  1 OUACHITA, LA(MONROE)                  122600   18375 153   829500
72 1912  1 LAFAYETTE, LA                         122200   22169 181   951700
72 1908  1 RAPIDES, LA(ALEXANDRIA)               122100   16690 136  1073800
72 1909  2 CALCASIEU & 1, LA(LAKE CHARLES)       158300   23293 147  1232100
72 3704  1 COMANCHE, OK(LAWTON)                  105400   12504 118  1337500
72 4427  1 NUECES, TX(CORPUS CHRISTI)            244700   36743 150  1582200
72 4455  1 JEFFERSN, TX(BEAUMONT)                238300   34520 144  1820500
72 4424  1 HIDALGO, TX(MCALLEN)                  217600   22831 104  2038100
72 4403  1 LUBBOCK, TX                           194500   35564 183  2232600
72 4456  1 GALVESTON, TX                         179100   24202 135  2411700
72 4425  1 CAMERON, TX(BROWNSVILLE)              168300   19114 113  2580000
72 4409  1 BELL, TX(KILLEEN)                     158100   23232 146  2738100
72 4408  1 MCLENNAN, TX(WACO)                    154400   25704 166  2892500
72 4407  1 WICHITA, TX(WICHITA FALLS)            118900   17653 148  3011400
72 4446  1 SMITH, TX(TYLER)                      105700   19866 187  3117100
72 4404  1 TAYLOR, TX(ABILENE)                   103200   21593 209  3220300
72 4402  2 POTTER-RANDALL, TX(AMARILLO)          150200   34136 227  3370500
72 4413  2 ECTOR-WINKLER, TX(ODESSA)             102900   19491 189  3473400
72 4447  3 GREGG & 2, TX(LONGVIEW)               111800   20011 178  3585200
72 4448  3 BOWIE & 2, TX(TEXARKANA)              107900   17534 162  3693100
72 4438  4 GRAYSON & 3, TX(SHERMAN)              126400   24756 195  3819500
72 4452  4 BRAZOS & 3, TX(BRYAN)                 123500   22178 179  3943000
72 4422  4 WEBB & 3, TX(LAREDO)                  108000   14114 130  4051000
72 4414  7 MIDLAND & 6, TX                       100700   21971 218  4151700
72 4420 10 TOM GREEN & 9, TX(SAN ANGELO)         107800   22277 206  4259500
73 WEST SOUTH CENTRAL, LARGE SUBURBAN PSUS
73 1921  1 JEFFERSON, LA(N.O. METRO)             392300   59061 150   392300
74 WEST SOUTH CENTRAL, SMALL SUBURBAN PSUS
74  416  2 SALINE-GARLAND, AR                    105300   14800 140   105300
74  405  4 CRITT-LOIN-CROSS-WOOD, AR(NE)         109200   25065 229   214500
74 1919  2 WASHINGTON-ST. TAMMANY, LA(EAST)      115200   19034 165   329700
74 1902  2 BOSSIER-WEBSTER, LA(NW)               106400   22133 208   436100
74 1923  2 ST. BERNARD-PLAQUEMINES, LA(SE)        83300   14107 121   519400
74 3713  1 CLEVELAND, OK(O.C. METRO)             102600   12114 118   622000
74 3716  4 CANADIAN & 3, OK(O.C. METRO)          128100   21899 170   750100
74 3714  4 POTTAWATOMIE & 3, OK(O.C. METRO)      122200   17064 147   872300
74 3710  4 CREEK & 3, OK(TULSA METRO)            109800   18022 164   982100
74 3707  5 ROGERS & 4, OK(TULSA METRO)           122300   23224 189  1104400
74 3711  5 PITTSBURG & 4, OK(FT. SMITH METRO     116100   17113 147  1220500
74 4457  1 BRAZORIA, TX(HOUSTON METRO)           118800   17196 144  1339300
74 4439  2 DENTON-WISE, TX(DALLAS METRO)         117900   16224 154  1457200
74 4440  2 JOHNSON-ELLIS, TX(DALLAS METRO)       106300   18971 178  1563500
74 4454  2 HARDIN-ORANGE, TX(BEAUMONT METRO)     106200   16642 156  1669700
74 4441  3 COLLIN & 2, TX(DALLAS METRO)          134000   21704 161  1803700
74 4453  3 MONTGOMERY & 2, TX(HOUSTON METRO)     130300   18757 143  1934000
74 4429  3 FORT BEND & 2, TX(HOUSTON METRO)      100800   13039 135  2034800
74 4435  5 CORYELL & 4, TX(KILLEEN METRO)        100300   15595 156  2135100
74 4423  6 HAYS & 5, TX(AUSTIN-S.A. METRO)       105800   16427 174  2240900
74 4428  6 SAN PATRICIO & 5, TX(C.C. METRO)      101100   15553 194  2342000
74 4437  7 PARKER & 6, TX(F. WORTH METRO)        104400   23209 223  2446400
75 WEST SOUTH CENTRAL, RURAL LOW GAS SALES PSUS
75  413  6 UNION & 5, AR(SOUTH)                  108800   13726 120   108800
75  412  6 ASHLEY & 5, AR(SE)                    102000   14856 145   210800
75  403  7 GREENE & 6, AR(NE)                    138600   20217 145   349400
75  402 10 BOONE & 9, AR(NORTH)                  115600   14593 125   465000
75 1917  2 TERREBONNE-ST. MARY, LA(SOUTH)        140900   20610 146   605900
75 1916  2 AVOYELLES-ST. LANDRY, LA(CEN)         117400   14615 124   723300
75 1918  2 LIVINGSTON-TANGIPAHOA, LA(EAST)       110000   15067 141   833300
75 1913  3 IBERIA-ST. MARTIN-VERM., LA(SOUTH     137500   15757 114   970800
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75 1911  4 ACADIA & 3, LA(WC)                       135500   19405 143  110130
75 1915  4 ASCENSION & 3, LA(SC)                    104000   11268 108  121130
75 1907  5 VERNON & 4, LA(WEST)                     121600   13584 111  133190
75 1903  5 LINCOLN & 4, LA(NORTH)                   105100   12280 116  143700
75 1914  6 IBERVILLE & 5, LA(CEN)                   105200   11440 108  154100
75 1905  7 MOREHOUSE & 6, LA(NE)                    124700   15886 127  166090
75 1906  7 NATCHITOCHES & 6, LA(NC)                 124000   14464 116  179090
75 3708  4 MUSKOGEE & 3, OK(EAST)                   128700   16008 124  191000
75 3712  6 MCCURTAIN & 5, OK(SE)                    105700   15068 142  202530
75 4450  6 NACOGDOCHES & 5, TX(EAST)                116900   15287 130  214220
75 4426  6 KLEBERG & 5, TX(SOUTH)                   105000   15431 147  224100
76 WEST SOUTH CENTRAL, RURAL AVERAGE GAS SALES PSUS
76  404  2 CRAIGHEAD-MISS, AR(NE)                   118200   19480 164   11820
76  410  6 ST. FRANCIS & 5, AR(EAST)                141100   23120 163   25930
76  406  6 FAULKNER & 5, AR(NC)                     130100   21171 162   38040
76  407  6 POPE & 5, AR(NW)                         104000   16133 155   49340
76 1926  2 LAFOURCHE-ST. CHARLES, LA(SE)            102400   15868 154   59580
76 3706  4 WASHINGTON & 3, OK(NORTH)                128300   19275 150   72010
76 3709  5 PAYNE & 4, OK(NC)                        121100   22215 183   84020
76 3715  8 CARTER & 7, OK(SOUTH)                    146000   24555 168   99120
76 4449  4 HARRISON & 3, TX(EAST)                   104700   18208 173  109130
76 4434  5 WILLIAMSON & 4, TX(CEN)                  114400   17909 156  121030
76 4431  5 VICTORIA & 5, TX(SOUTH)                  109900   18016 163  132020
76 4430  5 GUADALUPE & 4, TX(SC)                    101300   16687 164  142150
76 4451  5 ANGELINA & 4, TX(EAST)                   100300   18551 187  152180
76 4433  6 BASTROP & 5, TX(EC)                      100000   16353 163  162180
76 4421 10 MAVERICK & 9, TX(SW)                     106100   16881 159  172790
77 WEST SOUTH CENTRAL, RURAL HIGH GAS SALES PSUS
77  414  7 CLARK & 6, AR(SW)                        105600   20537 195   10560
77 3705  6 GARFIELD & 5, OK(NORTH)                  103100   21010 203   20870
77 3717  8 JACKSON & 7, OK(SW)                      105400   19834 188   31410
77 3701 10 CUSTER & 9, OK(NW)                        97500   24948 255   41160
77 4442  4 NAVARRO & 3, TX(EC)                      109300   20875 190   52090
77 4432  4 WHARTON & 3, TX(SE)                       97800   19934 204   61870
77 4443  5 ANDERSON & 4, TX(EC)                     104700   22002 210   72340
77 4445  5 HUNT & 4, TX(NE)                         101100   19823 196   82450
77 4444  5 LAMAR & 4, TX(NE)                         99800   18655 186   92430
77 4419  7 HOWARD & 6, TX(WEST)                     104100   27543 265  102840
77 4415 10 LAMB & 9, TX(NW)                         115600   23965 207  114400
77 4436 10 BROWN & 9, TX(CEN)                       109400   24223 221  125340
77 4416 13 HUTCHINSON & 12, TX(NORTH)               110900   31120 280  136430
77 4412 13 VAL VERDE & 12, TX(WEST)                 104100   30275 290  146840
77 4417 14 HALE & 13, TX(NORTH)                     110400   22580 204  157880
77 4418 16 WILBARGER & 15, TX(NORTH)                102800   22741 221  168160
81 MOUNTAIN, LARGE URBAN PSUS
81  301  1 MARICOPA, AZ(PHOENIX)                   1172200  169657 144 1172200
81  302  2 PIMA-STA. CRUZ, AZ(TUCSON)               456600   63958 141 1628800
81  601  1 DENVER, CO                               521700   72367 144 2124500
81 2901  1 CLARK, NV(LAS VEGAS)                     319600   69326 216 2444100
81 3203  1 BERNALILLO, NM(ALBUQUERQUE)              355800   62620 175 2800900
81 4503  2 SALT LAKE-TOOELE, UT                     522600   79706 152 3323500
82 MOUNTAIN, SMALL URBAN PSUS
82  602  1 EL PASO, CO(COLORADO SPRINGS)            287800   47788 166  287800
82  606  1 BOULDER, CO                              162000   20937 129  449800
82  611  1 PUEBLO, CO                               124300   19543 156  574100
82  607  1 LARIMER, CO(FORT COLLINS)                114900   14897 129  689000
82  608  1 WELD, CO(GREELEY)                        106600   15032 141  795600
82 1304  1 ADA, ID(BOISE)                           131500   25190 191  927100
82 2706  5 YELLOWSTONE & 4, MT(BILLINGS)            116100   24147 207 1043200
82 2704  5 CASCADE & 4, MT(GREAT FALLS)             114300   18802 164 1157500
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82 2902  1 WASHOE, NV(RENO)                   142700   36217 253  1300200
82 4501  3 WEBER & 2, UT(OGDEN)               143100   19495 136  1443300
82 4504  5 UTAH & 4, UT(PROVO)                198500   33906 170  1641800
83 MOUNTAIN, LARGE SUBURBAN PSUS
83  605  1 JEFFERSON, CO                      294000   42625 144   294000
83  603  1 ADAMS, CO                          211700   36673 173   505700
83  604  1 ARAPAHOE, CO                       205600   31263 152   711300
84 MOUNTAIN, SMALL SUBURBAN PSUS
84 4502  1 DAVIS, UT(SALT LAKE CITY METRO)    110400   10828  98   110400
85 MOUNTAIN, RURAL LOW GAS SALES PSUS
85 1303  6 CANYON & 5, ID(SW)                 116000   12067 104   116000
85 3201  3 SAN JUAN & 2, NM(NW)               108600   15085 138   224600
86 MOUNTAIN, RURAL AVERAGE GAS SALES PSUS
86  306  2 PINAL-GILA, AZ                     115500   19203 166   115500
86  307  3 COCHISE-GRAHAM-GREENLEE, AZ        103700   17525 169   219200
86 1306  5 BANNOCK & 4, ID(SE)                105200   18559 176   324400
86 1302  7 NEZ PERCE & 6,ID(NC)                92200   14177 153   416600
86 3208  3 LEA & 2, NM(SE)                    108400   18876 174   525000
86 3202  3 SANTA FE & 2, NM(NC)                98300   17475 177   623300
86 4506  6 CACHE & 5, UT-ID(NORTH)            106300   17684 166   729600
87 MOUNTAIN, RURAL HIGH GAS SALES PSUS
87  304  2 COCONINO-YAVAPAI, AZ(FLAGSTAFF)    111300   34462 309   111300
87  303  2 YUMA-MOHAVE, AZ                    103100   32375 314   214400
87  305  2 NAVAJO-APACHE, AZ                   96000   26535 276   310400
87  610 10 OTERO & 9, CO(SE)                  104300   25924 248   414700
87  613 13 MESA & 12, CO(NW)                  140000   35413 252   554700
87  609 13 MORGAN & 12, CO(NE)                101500   27416 270   656200
87  612 18 LA PLATA & 17, CO(SW)              141600   27242 192   797800
87 1301  5 KOOTENAI & 4, ID(NORTH)             94500   18721 198   892300
87 1305  8 TWIN FALLS & 7, ID(SOUTH)          119800   24192 201  1012100
87 1307  9 BONNEVILLE & 8, ID(EAST)           110400   22252 201  1122500
87 2701  7 MISSOULA & 6, MT(WEST)             169300   34601 204  1291800
87 2702  7 SILVER BOW & 6, MT(SW)             119600   24477 204  1411400
87 2703 14 GALLATIN & 13, MT(SOUTH)            98600   23799 241  1510000
87 2705 18 HILL & 17, MT(NE)                  117300   24941 212  1627300
87 2903 18 CARSON CITY & 17, NV-CA            135700   58433 430  1763000
87 3204  3 VALENCIA & 2, NM(WEST)             103100   25121 243  1866100
87 3207  4 CHAVES & 3, NM(SOUTH)              104300   19763 189  1970400
87 3206  6 DONA ANA & 5, NM(SW)               132000   34097 258  2102400
87 3205  9 SAN MIGUEL & 8, NM(NE)             110100   34405 312  2212500
87 4505 15 SEVIER & 14, UT(SOUTH)             121600   32675 268  2334100
87 5103  5 LARAMIE & 4, WY(SE)                124800   34296 274  2458900
87 5102  8 NATRONA & 7, WY(NE)                109200   29054 266  2568100
87 5101 10 FREMONT & 9, WY(WEST)              125400   37168 296  2693500
91 PACIFIC, LARGE URBAN PSUS
91  526  1 LOS ANGELES, CA                   6926100 1118651 161  6926100
91  529  1 ORANGE, CA(ANAHEIM)               1660900  266538 160  8587000
91  532  1 SAN DIEGO, CA                     1518000  214513 141 10105000
91  517  1 SANTA CLARA, CA(SAN JOSE)         1181600  184316 155 11286600
91  512  1 ALAMEDA, CA(OAKLAND)              1088600  172437 158 12375200
91  530  1 SAN BERNARDINO, CA                 702600  130335 185 13077800
91  509  1 SACRAMENTO, CA                     687200  113641 165 13765000
91  514  1 SAN FRANCISCO, CA                  677000   92433 136 14442000
91  522  1 FRESNO, CA                         439400   75923 172 14881400
91  527  1 VENTURA, CA                        430200   67829 157 15311600
91  525  1 KERN, CA(BAKERSFIELD)              337600   79517 235 15649200
91  531  2 RIVERSIDE-IMPERIAL, CA             592300  109372 184 16241500
91 3802  1 MULTNOMAH, OR(PORTLAND)            538500   97753 181 16780000
91 4806  1 KING, WA(SEATTLE)                 1135200  193682 170 17915200
91 4805  1 PIERCE, WA(TACOMA)                 397600   63109 158 18312800
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91 4815  1 SPOKANE, WA                              303800    46758 153 1881600
92 PACIFIC, SMALL URBAN PSUS
92  518  1 SAN JOAQUIN, CA(STOCKTON)                299200    50655 169  299200
92  526  1 SANTA BARBARA, CA                        281800    47152 167  581000
92  521  1 MONTEREY, CA                             260600    44601 171  841600
92  507  1 SONOMA, CA(SANTA ROSA)                   242600    44739 164 1084200
92  519  1 STANISLAUS, CA(MODESTO)                  211100    33541 158 1295300
92  510  1 SOLANO, CA(VALLEJO)                      180200    33617 186 1475500
92  516  1 SANTA, CRUZ, CA                          147200    24460 166 1622700
92 3810  1 LANE, OR(EUGENE)                         236600    40011 169 1859300
92 3805  1 MARION, OR(SALEM)                        163800    25105 153 2023100
92 4806  1 SNOHOMISH, WA(EVERETT)                   261200    45699 174 2284300
92 4810  1 YAKIMA, WA                               151200    25247 166 2435500
92 4812  3 BENTON & 2, WA(RICHLAND)                 110100    19255 174 2545600
93 PACIFIC, LARGE SUBURBAN PSUS
93  513  1 CONTRA COSTA, CA                         583600    86424 148  583600
93  515  1 SAN MATEO, CA                            572600    97501 170 1156200
93  511  1 MARIN, CA                                214200    30973 144 1370400
93 3803  1 CLACKAMAS, OR(PORTLAND METRO)            201000    25134 125 1571400
94 PACIFIC, SMALL SUBURBAN PSUS
94  506  2 YOLO-NAPA, CA(NC)                        192300    29765 154  192300
94  508  4 PLACER & 3, CA(NC)                       175600    41355 235  367900
94 3804  1 WASHINGTON, OR(PORTLAND METRO)           190800    27524 144  558700
94 4803  2 CLARK-SKAMANIA, WA(PORT. METRO)          155600    16375 109  714300
95 PACIFIC, RURAL LOW GAS SALES PSUS
95  505  4 YUBA & 3, CA(NC)                         121100    17607 145  121100
95 3801  5 YAMHILL & 4, OR(NW)                      161600    23127 143  282700
95 4807  1 KITSAP, WA(WC)                           106400    12340 115  389100
95 4813  5 WHITMAN + 4, WA(SE)                      104500    13501 129  493600
96 PACIFIC, RURAL AVERAGE GAS SALES PSUS
96  523  2 TULARE-KINGS, CA(CEN)                    271800    41316 152  271800
96  501  2 HUMBOLDT-DEL NORTE,CA(NW)                119900    21233 176  391700
96 3808  3 JACKSON-KLAMATH-LAKE, OR(SOUTH)          169700    39538 162  561400
96 3809  3 BENTON-LINN-LINCOLN, OR(WEST)            168100    29793 173  729500
96 4804  2 THURSTON-MASON, WA(WEST)                 111600    16502 169  841100
96 4802  3 COWLITZ & 2, WA(SW)                      122200    22049 180  953300
96 4819  4 WHATCOM & 3, WA(NW)                      179600    30676 171 1142900
96 4801  4 GRAYS HARBOR & 3, WA(WEST)               128100    22446 175 1271000
96 4814  7 OKANOGAN & 6, WA(NE)                      99100    14846 149 1370100
97 PACIFIC, RURAL HIGH GAS SALES PSUS
97  524  1 SAN LUIS OBISPO, CA(SW)                  125200    27175 217  125200
97  503  4 BUTTE & 3, CA(NORTH)                     178600    35596 199  303800
97  502  4 SHASTA & 3, CA(NORTH)                    139000    34534 247  442800
97  504  4 MENDOCINO & 3, CA(NW)                    112600    25007 222  555400
97  520  5 MERCED & 4, CA(CEN)                      212200    41039 193  767600
97 3811  4 DOUGLAS & 3, OR(SW)                      200800    42227 210  968400
97 3807  8 UMATILLA & 7, OR(EAST)                   134000    27557 206 1102400
97 3806  8 DESCHUTES & 7, OR(NC)                    101100    23324 231 1203500
97 4811  3 GRANT-CHELAN-KITTITAS, WA(CEN)           110000    23616 269 1313500
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APPENDIX B

PLAN 2 PSUs ORGANIZED BY REGIONAL AND URBANICITY STRATA

APPENDIX B

LIST OF PLAN 2 PSUS ORGANIZED BY REGIONAL AND URBANICITY STRATA

THE THREE NUMBERS IN FRONT OF THE PSU NAME ARE THE STRATA CODE, THE PSU IDENTIFICATION NUMBER, AND THE NUMBER OF COUNTIES IN THE PSU. THE FOUR NUMBERS FOLLOWING THE PSU NAME ARE THE TOTAL PSU POPULATION, THE TOTAL PSU GAS SALES, THE GAS SALES PER CAPITA, AND THE CUMULATIVE POPULATION TOTAL WITHIN THE STRATUM.

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11 NEW ENGLAND, LARGE URBAN PSUS
11 0707  1 HARTFORD SMSA(-TOLLAND COUNTY),CT 649900  109417 168   649900
11 0704  1 NEW HAVEN SMSA, CT                415400   68044 163  1065300
11 0703  1 BRIDGEPORT SMSA, CT               394900   67085 169  1460200
11 2210  1 SUFFOLK COUNTY, MA(BOSTON)        713400   66737  93  2173600
11 2205  1 WORCESTER SMSA(MASS) + 8, MA      425800   53663 126  2599400
11 2203  1 SPRINGFIELD & 11, HAMPDEN COUNTY, 336500   50512 150  2935900
11 4001  1 PROVIDENCE COUNTY (-CRANSTON), RI 506600   62750 123  3442500
12 NEW ENGLAND, SMALL URBAN PSUS
12 0705  1 WATERBURY SMSA(83-3), CT          234800   29821 127   234800
12 0709  1 NEW LONDON SMSA, CT               224900   34814 154   459700
12 0701  1 STAMFORD SMSA, CT                 202000   45709 226   661700
12 0702  2 NORWALK-DANBURY-SMSAS(81-1), CT   255600   42003 164   917300
12 0706  2 BRISTOL SMSA & LITCH.(82-1), CT   209600   29745 141  1126900
12 0708  3 N.H.-MER. SM & MID. NON-SM(82),CT 278800   49658 178  1405700
12 2002  1 CUMBERLAND, ME(PORTLAND)          201500   33373 165  1607200
12 2004  5 ANDROSCOGGIN & 4, ME(WEST)        222100   31821 143  1829300
12 2211  1 LAWRENCE SMSA, MA                 229100   35760 156  2058400
12 2207  1 LOWELL SMSA, MA                   226200   29055 128  2284600
12 2213  2 NEW BEDFORD-FALL RIVER SMSAS, MA  309700   38752 125  2594300
12 2214  2 BROCKTON SMSA(87), MA             262200   41325 157  2856500
12 2204  2 FITCHBURG SMSA & FRANK-NW WOR, MA 229100   33739 147  3085600
12 2201  2 BERKSHIRE COUNTY & 11, MA(PITT.)  200800   31309 155  3286400
12 3001  1 HILLSBOROUGH, NH(MANCHESTER)      238500   38198 160  3524900
12 4002  2 KENT(& CRANSTON), RI(WARWICK)     223600   34010 152  3748500
13 NEW ENGLAND, LARGE SUBURBAN PSUS
13 2208  1 MIDDLESEX PART(81-4), BOS SMSA,MA1090100  155251 142  1090100
13 2209  1 NORFOLK PART(-3),BOSTON SMSA, MA  486300   76731 157  1576400
13 2212  1 ESSEX PART(87), BOSTON SMSA, MA   417600   56557 135  1994000
14 NEW ENGLAND, SMALL SUBURBAN PSUS
14 0710  3 TOLLAND-WINDHAM COUNTIES(84), CT  211200   28827 136   211200
14 2202  1 HAMPSHIRE(83-3),MA(SPR. MET)      207800   27404 131   419000
14 2216  2 PLYMOUTH PART(82), BOSTON SMSA,MA 215900   28609 132   634900
14 4003  3 WASHINGTON-NEWPORT-BRISTOL, RI    237200   30472 128   872100
15 NEW ENGLAND, RURAL LOW GAS SALES PSUS
15 2001  2 YORK-STRAFFORD, ME-NH(SW)         198000   30290 152   198000
15 2003  5 KENNEBEC & 4, ME(SOUTH)           205600   27300 132   403600
15 2206  2 MARLBORO & 21, WORC.-MIDDLE., MA  211600   24931 117   615200
16 NEW ENGLAND, RURAL AVERAGE GAS SALES PSUS
16 2005  4 PENOBSCOT & 3, ME(EAST)           298500   50490 169   298500
16 3003  6 GRAFTON & 5, NH(NORTH & WEST)     241000   42424 176   539500
16 4001  8 CHITTENDEN & 7, VT(NORTH)         257500   45342 176   797000
17 NEW ENGLAND, RURAL HIGH GAS SALES PSUS
17 2215  3 PLYMOUTH-BRIS NON-SMSA(-1) + 3,MA 237900   47428 199   237900
17 3002  2 MERRIMACK-ROCKINGHAM, NH(SOUTH)   249200   45654 183   487100
17 4002  6 RUTLAND & 5, VT(SOUTH)            212800   41798 196   699900
21 MIDDLE ATLANTIC, LARGE URBAN PSUS
21 3106  1 ESSEX, NJ(NEWARK)                 896700  104510 116   896700
21 3110  1 MIDDLESEX, NJ(NEW BRUNSWICK)      590200   95045 161  1486900
21 3107  1 HUDSON, NJ(JERSEY CITY)           583000   62770 107  2069900
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21 3111  1 MONMOUTH, NJ(LONG BRANCH)            485700    73033 150  2555600
21 3104  1 PASSAIC, NJ(PATERSON)                456200    60497 132  3011800
21 3112  1 MERCER, NJ(TRENTON)                  319100    51442 161  3330900
21 3324  1 NEW YORK CITY, NY                   7567100   470625  62 10898000
21 3325  1 NASSAU, NY                          1398000   274102 196 12296000
21 3326  1 SUFFOLK, NY(NASSAU METRO)           1222700   164582 134 13518700
21 3302  1 ERIE, NY(BUFFALO)                   1093400   131378 120 14612100
21 3327  1 MONROE, NY(ROCHESTER)                706900    99186 140 15319000
21 3309  1 ONONDAGA, NY(SYRACUSE)               472200    68517 145 15791200
21 3931  1 PHILADELPHIA, PA                    1841800   157317  85 17633000
21 3907  1 ALLEGHANY, PA(PITTSBURG)            1532100   205225 133 19165100
21 3920  1 LUZERNE, PA(WILKES-BARRE)            347400    51330 147 19512500
21 3932  1 LANCASTER, PA                        337900    50790 150 19850400
21 3926  1 BERKS, PA(READING)                   304500    45657 149 20154900
22 MIDDLE ATLANTIC, SMALL URBAN ESUS
22 3115  2 ATLANTIC-CAPE MAY, NJ(ATL. CITY)     260600    42735 163   260600
22 3102  3 CUMBERLAND & 2, NJ(VINELAND)         380000    69764 181   640600
22 3316  1 ALBANY, NY                           288700    36251 125   929300
22 3311  1 ONEIDA, NY(UTICA)                    270300    37151 137  1199600
22 3306  1 BROOME, NY(BINGHAMTON)               216900    35424 163  1416500
22 3320  2 DUTCHESS-PUTNAM, NY(POUGHKEEPSIE)    299200    35798 119  1715700
22 3317  2 RENSSELAER-COLUMBIA, NY(TROY)        209300    27737 132  1925000
22 3318  3 SCHENECTADY & 2, NY                  226300    32374 143  2151300
22 3308  3 CHEMUNG & 2, NY(ELMIRA)              217000    31807 146  2368300
22 3915  1 YORK, PA                             284000    48741 171  2652300
22 3901  1 ERIE, PA                             273700    46547 170  2926000
22 3925  1 LEHIGH, PA(ALLENTOWN)                263300    42014 159  3189300
22 3922  1 LACKAWANNA, PA(SCRANTON)             233400    34158 146  3422700
22 3917  1 DAUPHIN, PA(HARRISBURG)              226800    41597 183  3649500
22 3924  1 NORTHAMPTON, PA(BETHLEHEM)           222600    27492 123  3872100
22 3910  2 CAMBRIA-SOMERSET, PA(JOHNSTOWN)      286000    43573 152  4158100
22 3911  4 BLAIR & 3, PA(ALTOONA)               219100    32194 147  4377200
22 3919  4 LYCOMING & 3, PA(WILLIAMSPORT)       223700    34761 155  4600900
23 MIDDLE ATLANTIC, LARGE SUBURBAN ESUS
23 3105  1 BERGEN, NJ(N.Y. METRO)               874600   159658 182   874600
23 3108  1 UNION, NJ(NEWARK METRO)              526500    87531 166  1401100
23 3116  1 CAMDEN, NJ(PHIL. METRO)              476700    64127 134  1877800
23 3103  1 MORRIS, NJ(NEWARK METRO)             395900    61762 156  2273700
23 3113  1 BURLINGTON, NJ(PHIL. METRO)          346700    54202 156  2620400
23 3109  1 SOMERSET, NJ(NEWARK METRO)           200200    31467 157  2820600
23 3323  1 WESTCHESTER, NY(N.Y. METRO)          880800   148566 168  3701400
23 3322  1 ROCKLAND, NY(N.Y. METRO)             246000    36358 147  3947400
23 3303  1 NIAGARA, NY(BUFFALO METRO)           237300    28946 121  4184700
23 3928  1 MONTGOMERY, PA(PHIL. METRO)          632100   118022 186  4816800
23 3930  1 DELAWARE, PA(PHIL METRO)             589400    83559 141  5406200
23 3927  1 BUCKS, PA(PHIL. METRO)               448200    68760 153  5854400
23 3918  1 WESTMORELAND, PA(PITTS. METRO)       378500    61402 162  6232900
23 3929  1 CHESTER, PA(PHIL. METRO)             288200    43438 150  6521100
23 3906  1 WASHINGTON, PA(PITTS. METRO)         213700    38281 179  6734800
23 3905  1 BEAVER, PA(PITTS. METRO)             209200    30425 145  6944000
24 MIDDLE ATLANTIC, SMALL SUBURBAN ESUS
24 3315  3 SARATOGA & 2, NY(ALBANY METRO)       247700    34371 138   247700
24 3310  3 OSWEGO & 2, NY(SYR. METRO)           224400    32066 142   472100
24 3305  4 ONTARIO & 3, NY(ROCH. METRO)         219700    34974 159   691800
24 3313  5 MONTGOMERY & 4, NY(ALBANY METRO)     220400    33398 151   912200
24 3916  2 CUMBERLAND-PERRY, PA(HARRIS. MET)    198700    44907 226  1110900
24 3923  5 MONROE & 4, PA(NE)                   209400    47211 225  1320300
25 MIDDLE ATLANTIC, RURAL LOW GAS SALES ESUS
25 3114  1 OCEAN, NJ(EAST)                      285600    41376 144   285600
25 3321  1 ORANGE, NY(SOUTH)                    239700    37204 155   525300
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25 3301  2 CHAUTAUQUA-CATTARAUGUS, NY(SW)     232600    32176 138    757900
25 3314  3 ST. LAWRENCE & 2, NY(NORTH)        243100    25608 105   1001000
25 3307  4 TOMPKINS & 3, NY(CEN)              256800    35820 139   1257800
25 3312  4 OTSEGO & 3, NY(CEN)                219400    25981 118   1477200
25 3304  5 LIVINGSTON & 4, NY(WEST)           242200    34762 143   1719400
26 MIDDLE ATLANTIC, RURAL AVERAGE GAS SALES PSUS
26 3101  3 SUSSEX & 2, NJ(NW)                 252100    40959 162    252100
26 3319  2 ULSTER-SULLIVAN, NY(SOUTH)         212700    36696 172    464800
26 3921  2 SCHUYLKILL-LEBANON, PA(EC)         264900    45558 171    729700
26 3903  2 MERCER-LAWRENCE, PA(WEST)          236000    38422 162    965700
26 3909  2 FAYETTE-GREENE, PA(SW)             193400    34715 179   1159100
26 3904  3 BUTLER & 2, PA(WEST)               295500    48676 164   1454600
26 3902  4 CRAWFORD & 3, PA(NW)               200700    34935 174   1655300
26 3916  5 NORTHUMBERLAND & 4, PA(EC)         238000    41163 172   1893300
27 MIDDLE ATLANTIC, RURAL HIGH GAS SALES PSUS
27 3913  3 CENTER & 2, PA(CEN)                221500    48397 218    221500
27 3912  4 FRANKLIN & 3, PA(SOUTH)            221800    50132 226    443300
27 3914  6 JEFFERSON & 5, PA(NC)              199900    40236 201    643200
31 EAST NORTH CENTRAL, LARGE URBAN PSUS
31 1407  1 COOK, IL(CHICAGO)                 5371900   736592 137   5371900
31 1514  1 MARION, IN(INDIANAPOLIS)           792200   154860 195   6164100
31 1501  1 LAKE, IN(GARY)                     549400    90976 165   6713500
31 2311  1 WAYNE, MI(DETROIT)                2556300   373429 146   9269800
31 2315  1 GENESEE, MI(FLINT)                 453900    80927 178   9723700
31 2321  1 KENT, MI(GRAND RAPIDS)             419500    79185 188  10143200
31 3606  1 CUYAHOGA, OH(CLEVELAND)           1620500   250913 154  11763700
31 3630  1 HAMILTON, OH(CINCINNATI)           902000   151333 167  12665700
31 3619  1 FRANKLIN, OH(COLUMBUS)             859100   143695 167  13524800
31 3628  1 MONTGOMERY, OH(DAYTON)             595400    98702 165  14120200
31 3608  1 SUMMIT, OH(AKRON)                  540100    96642 178  14660300
31 3602  1 LUCAS, OH(TOLEDO)                  481600    75666 157  15141900
31 3612  1 STARK, OH(CANTON)                  380000    58092 152  15521900
31 3611  1 MAHONING, OH(YOUNGSTOWN)           303600    45752 150  15825500
31 5504  1 MILWAUKEE, WI                     1033600   143355 138  16859100
31 5501  1 DANE, WI(MADISON)                  303000    55699 183  17162100
32 EAST NORTH CENTRAL, SMALL URBAN PSUS
32 1403  1 WINNEBAGO, IL(ROCKFORD)            243800    44094 180    243800
32 1412  1 PEORIA, IL                         198900    36759 184    442700
32 1410  2 ROCK ISLAND-HENRY, IL              217000    43913 202    659700
32 1414  3 MC LEAN-DE WITT-MACON, ILL         256400    54181 211    916100
32 1416  3 KANKAKEE & 2, IL                   227300    42023 184   1143400
32 1418  3 SANGAMON & 2, IL(SPRINGFIELD)      208700    42722 204   1352100
32 1415  4 CHAMPAIGN & 3, IL                  212600    37487 176   1564700
32 1506  1 ALLEN, IN(FORT WAYNE)              288900    49584 171   1853600
32 1503  1 ST JOSEPH, IN(SOUTH BEND)          245300    41015 167   2098900
32 1508  2 MADISON-GRANT, IN(ANDERSON)        223800    39289 175   2322700
32 1520  3 VANDERBURGH & 2, IN(EVANSVILLE)    220400    36501 165   2543100
32 1507  5 DELAWARE & 4, IN(MUNCIE)           223100    37837 169   2766200
32 1512  6 VIGO & 5, IN(TERRE HAUTE)          207800    41082 197   2974000
32 1511  6 MONROE & 5, IN(BLOOMINGTON)        202000    33971 168   3176000
32 1510  7 TIPPECANOE & 6, IN(LAFAYETTE)      207800    39321 189   3383800
32 2307  1 INGHAM, MI(LANSING)                266700    43343 162   3650500
32 2308  1 WASHTENAW, MI(ANN ARBOR)           250100    40983 163   3900600
32 2316  1 SAGINAW, MI                        226900    35091 154   4127500
32 2304  1 KALAMAZOO, MI                      200900    34003 169   4328400
32 2305  3 CALHOUN-KA.-BAR., MI(BATTLE CREEK  257100    42656 165   4585500
32 2302  3 JACKSON-BRANCH-HILLSDALE, MI       223600    37024 165   4809100
32 2314  3 BAY-HURON-TUSCOLA, MI(BAY CITY)    208400    33525 160   5017500
32 2322  3 MUSKEGON-OCEANA-NEWAYGO, MI        207300    34057 164   5224800
32 3615  1 LORAIN, OH                         265800    40103 150   5490600
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32 3029  1 BUTLER, OH(HAMILTON)                    242300    38075 157   5732900
32 3009  1 TRUMBULL, OH(WARREN)                    239300    35891 149   5972200
32 3023  2 JEFFERSON-COLUMBIANA, OH(STEUBEN.       206700    31290 151   6178900
32 3014  3 RICHLAND-ASHLAND-CRAWFORD, OH(NC)       225600    36537 161   6404500
32 3018  3 CLARK & 2, OH(SPRINGFIELD)              224100    38831 173   6628600
32 3016  4 ALLEN & 3, OH(LIMA)                     218600    41599 190   6847200
32 5002  2 RACINE-KENOSHA, WI                      295600    45500 153   7142800
32 5007  2 WINNEBAGO-FOND DU LAC, WI(OSHKOSH)      218000    33476 153   7360800
32 5008  3 OUTAGAMIE & 2, WI(APPLETON)             232400    27954 120   7593200
32 5009  3 BROWN & 2, WI(GREEN BAY)                209000    30497 145   7802200
32 5014  8 LA CROSSE & 7, WI                       265200    45608 171   8067400
33 EAST NORTH CENTRAL, LARGE SUBURBAN PSUS
33 1406  1 DU PAGE, IL(NE)                         537800    96402 179    537800
33 1401  1 LAKE, IL(NE)                            394700    75353 190    932500
33 1421  1 ST. CLAIR, IL(ST. LOUIS METRO)          280400    36166 129   1212900
33 1408  1 WILL, IL(NE)                            279800    49424 176   1492700
33 1405  1 KANE, IL(NE)                            264100    48211 182   1756800
33 1426  1 MADISON, IL(ST. LOUIS METRO)            249300    41466 166   2006100
33 2310  1 OAKLAND, MI                             952500   158252 166   2958600
33 2312  1 MACOMB, MI                              659300   104279 158   3617900
33 3007  1 LAKE, OH(CLEVELAND METRO)               202200    35544 176   3820100
33 5003  1 WAUKESHA, WI(MIL. METRO)                246000    38410 156   4066100
34 EAST NORTH CENTRAL, SMALL SUBURBAN PSUS
34 1402  3 MC HENRY & 2, IL(NE)                    219600    38732 176    219600
34 1413  3 TAZEWELL & 2, IL(CEN)                   193500    39417 203    413100
34 1502  2 PORTER-LA PORTE, IN(NW)                 200900    44981 224    614000
34 1515  4 JOHNSON & 3, IN(CEN)                    206300    40993 198    820300
34 1513  4 HENDRICKS & 3, IN(CEN)                  204300    42483 207   1024600
34 1518  6 FLOYD & 5, IN(LOUISVILLE METRO)         207200    39079 188   1231800
34 2301  2 MONROE-LENAWEE, MI                      211500    31139 147   1443300
34 2306  3 OTTAWA-ALLEGAN-VAN BUREN, MI            269500    43046 159   1712800
34 2313  3 ST. CLAIR-LAPEER-SANILAC, MI            229000    29223 127   1941800
34 2309  4 SHIAWASSEE-LIV.-CLIN.-IONIA, MI         243000    32201 132   2184800
34 3010  3 PORTAGE-GEAUGA-ASHTABULA, OH(NE)        237300    50123 168   2432100
34 3027  3 GREENE-WARREN-CLINTON, OH(D-C MET       245600    40411 164   2727700
34 3003  3 WOOD-HANCOCK-SENECA, OH(TOL. MET)       224900    44533 199   2952600
34 3013  3 MEDINA-WAYNE-HOLMES, OH(NC)             210600    36112 171   3163200
34 3017  4 MIAMI & 3, OH(DAYTON METRO)             216300    35044 161   3379500
34 3022  4 BELMONT & 3, OH(WHEELING METRO)         203300    33522 164   3582800
34 3026  5 CLERMONT & 4, OH(CINCI METRO)           214300    32196 150   3797100
34 3001  7 DEFIANCE & 6, OH(TOL.-LIMA METRO)       215700    40503 186   4014800
34 5010  3 OZAUKEE-SHEBOYGAN-WASH., WI(MIL)        236800    26855 113   4251600
35 EAST NORTH CENTRAL, RURAL LOW GAS SALES PSUS
35 1419 11 ADAMS & 10, IL(WEST)                    218900    33306 152    218900
35 3025  5 SCIOTO & 4, OH(SOUTH)                   264400    38271 144    483300
35 5005  3 DODGE-JEFFERSON-WALWORTH, WI(SOUT       201200    29151 145    684500
35 5012  4 MARATHON & 3, WI(CEN)                   212700    29577 140    897200
36 EAST NORTH CENTRAL, RURAL AVERAGE GAS SALES PSUS
36 1404  6 STEPHENSON & 5, IL(NW)                  230300    38038 165    230300
36 1411  7 KNOX & 6, IL(WEST)                      212500    36689 173    442800
36 1423 11 JACKSON & 10, IL(SW)                    223100    40262 180    665900
36 1424 12 FRANKLIN & 11, IL(SE)                   220800    36178 163    886700
36 1509  5 HOWARD & 4, IN(CEN)                     216100    37125 171   1102800
36 1519  8 KNOX & 7, IN(SW)                        212100    33168 150   1314900
36 1517 10 JACKSON & 9, IN(SE)                     208400    37679 180   1523300
36 2317  6 MID.-ISA.-MONTM.-GRA.-GLA.-CLA.,M       236400    42197 178   1759700
36 2320 12 C&W UPPER PENINSULA, MI(MARQUETTE       266300    48542 181   2026000
36 3020  3 LICKING-KNOX-FAIRFIELD, OH(CEN)         238500    37298 156   2265100
36 3015  6 MARION & 5, OH(CEN)                     224500    38038 172   2489600
36 3021  7 MUSKINGUM & 6, OH(EC)                   224300    36793 164   2713900
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36 3624  7 ATHENS & 6, OH(SOUTH)                  222200    36970 166   2932100
36 5016  4 ROCK & 3, WI(SOUTH)                     199700    32171 161   3131800
36 5015  8 EAU CLAIRE & 7, WI                      274500    47064 171   3406300
36 5011 10 ONEIDA & 9, WI(NORTH)                   201700    34561 171   3608000
37 EAST NORTH CENTRAL, RURAL HIGH GAS SALES PSUS
37 1409  7 LA SALLE & 6, IL(NC)                    228600    53019 231    228600
37 1422  8 FAYETTE & 7, IL(SC)                     215800    40986 189    444400
37 1417 10 COLES & 9, IL(CEN)                      224800    52989 235    669200
37 1505  5 ELKHART & 4, IN(NE)                     251700    53554 212    920900
37 1516  7 WAYNE & 6, IN(EAST)                     234500    44801 191   1155400
37 1504  8 KOSCIUSKO & 7, IN(NORTH)                237600    49763 209   1393000
37 2303  3 BERRIEN-CASS-ST. JOSEPH, MI             265500    48847 183   1658500
37 2319 14 N E MICHIGAN, MI(ALPENA)                235700    53187 225   1894200
37 2318 13 N W MICHIGAN, MI(TRAVERSE CITY)         258600    56419 218   2152800
37 3604  4 ERIE & 3, OH(NORTH)                     230500    42962 186   2383300
37 5013  8 WOOD & 7, WI(CEN)                       225700    43473 192   2609000
37 5016 11 DOUGLAS & 10, WI(NW)                    211800    40012 188   2820800
41 WEST NORTH CENTRAL, LARGE URBAN PSUS
41 1704  1 SEDGWICK, KS(WICHITA)                   340700    61091 179    340700
41 2408  1 HENNEPIN, MN(MINNEAPOLIS)               924800   160669 173   1265500
41 2409  1 RAMSEY, MN(ST. PAUL)                    461700    80070 173   1727200
41 2604  1 JACKSON, MO(KANSAS CITY)                647900   123876 191   2375100
41 2608  1 ST. LOUIS CITY, MO                      534000    82158 153   2909100
41 2806  1 DOUGLAS, NE(OMAHA)                      414500    68037 164   3323600
42 WEST NORTH CENTRAL, SMALL URBAN PSUS
42 1609  1 POLK, IA(DES MOINES)                    297600    68087 228    297600
42 1606  2 SCOTT-CLINTON, IA(DAVENPORT)            204900    46080 224    502500
42 1607  3 LINN & 2, IA(CEDAR RAPIDS)              205200    42587 207    707700
42 1604  4 BLACK HAWK & 3, IA(WATERLOO)            204700    37462 183    912400
42 1605  7 DUBUQUE & 6, IA                         208900    34122 163   1121300
42 1601  8 WOODBURY & 7, IA(SIOUX CITY)            222000    42177 189   1343300
42 1708  3 SHAWNEE-JEFF-DOUG, KS(TOPEKA)           227900    42547 186   1571200
42 2402  3 ST. LOUIS & 2, MN(DULUTH)               233500    41163 176   1804700
42 2416  5 STEARNS & 4, MN(ST. CLOUD)              200400    39725 198   2005100
42 2412  6 OLMSTEAD & 5, MN(ROCHESTER)             206800    33226 160   2211900
42 2614  4 GREENE & 3, MO(SPRINGFIELD)             217300    36145 166   2429200
42 2605  6 BOONE & 5, MO(COLUMBIA)                 198600    42842 215   2627800
42 2601 14 BUCHANAN & 13, MO(ST. JOSEPH)           215500    43224 200   2843300
42 2804  2 LANCASTER-SAUNDERS, NE(LINCOLN)         200200    33637 168   3043500
42 3503  9 CASS & 8, ND(FARGO)                     216100    39122 181   3259600
42 4203 16 MINNEHAHA & 15, SD(SIOUX FALLS)         238700    57377 240   3498300
43 WEST NORTH CENTRAL, LARGE SUBURBAN PSUS
43 1710  1 JOHNSON, KS(K.C. METRO)                 232300    40325 173    232300
43 2607  1 ST. LOUIS COUNTY, MO                    967200   172958 178   1199500
44 WEST NORTH CENTRAL, SMALL SUBURBAN PSUS
44 1709  2 WYANDOTTE-LEAV, KS(K.C. METRO)          241500    41292 170    241500
44 2410  2 DAKOTA-GOODHUE, MN(MINN. METRO)         204100    33699 165    445600
44 2407  2 ANOKA-ISANTI, MN(MINN. METRO)           200600    27950 139    646200
44 2404  6 WASHINGTON & 5, MN(MINN. METRO)         196800    37591 191    843000
44 2411  7 WRIGHT & 6, MN(MINN. METRO)             205400    41111 200   1048400
44 2603  4 CLAY & 3, MO(K.C. METRO)                217800    43771 200   1266200
44 2609  4 JEFFERSON & 3, MO(S.L. METRO)           211700    40809 192   1477900
44 2606  7 ST. CHARLES & 6, MO(S.L. METRO)         203000    48815 240   1680900
45 WEST NORTH CENTRAL, RURAL LOW GAS SALES PSUS
45 1613  9 WAPELLO & 8, IA(SE)                     203700    36974 181    203700
46 WEST NORTH CENTRAL, RURAL AVERAGE GAS SALES PSUS
46 1603 12 CERRO GORDO & 11, IA(NORTH)             214200    39133 182    417900
46 1706 11 CRAWFORD & 10, KS(SE)                   207400    36446 175    625300
46 2413  6 RICE & 5, MN(SOUTH)                     191900    32695 170    817200
46 2414  9 BLUE EARTH & 8, MN(SW)                  209700    35727 170   1026900
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46 2405 15 LYON & 14, MN(WEST)                      201000   36200 180  1227900
46 2613 11 CASS & 10, MO(WEST)                      203000   33265 163  1430900
46 2612 14 COLE & 13, MO(SC)                        252900   42659 168  1683800
46 2805 12 SARPY & 11, NE(SE)                       201800   36530 181  1885600
47 WEST NORTH CENTRAL, RURAL HIGH GAS SALES PSUS
47 1606  7 STORY & 6, IA(CEN)                       226800   48082 212   226800
47 1612  8 JOHNSON & 7, IA(EC)                      213800   49116 229   440600
47 1610  9 POTTAWATTAMIE & 8, IA(WEST)              222000   50502 227   662600
47 1602 12 WEBSTER & 11, IA(NORTH)                  209600   49378 235   872200
47 1611 17 WARREN & 16, IA(SOUTH)                   221200   49457 223  1093400
47 1707 12 RILEY & 11, KS(NE)                       204900   40822 199  1298300
47 1705 12 LYON & 11, KS(EC)                        194800   43156 221  1493100
47 1703 14 SALINE & 13,KS(NC)                       206200   51809 251  1699300
47 1702 20 RENO & 19, KS(SW)                        209000   46026 220  1908300
47 1701 29 BARTON & 28, KS(NW)                      215000   53498 248  2123300
47 2403  9 OTTER TAIL & 8, MN(NC)                   246800   55073 223  2370100
47 2401 15 BELTRAMI & 14, MN(NORTH)                 234000   55545 237  2604100
47 2615  7 JASPER & 6, MO(SW)                       202800   37627 185  2806900
47 2610  8 CAPE GIRARDEAU & 7, MO(SE)               227500   42535 186  3034400
47 2611 16 BUTLER & 15, MO(SOUTH)                   267600   53708 200  3302000
47 2602 17 ADAIR & 16, MO(NE)                       210500   43227 205  3512500
47 2803 19 MADISON & 18, NE(NE)                     246500   51308 208  3759000
47 2802 26 HALL & 25, NE(CEN)                       250200   65539 261  4009200
47 2801 33 LINCOLN & 32, NE(WEST)                   229300   66981 292  4238500
47 3501 19 WARD & 18, ND(NORTH)                     212900   41734 196  4451400
47 3502 25 BURLEIGH & 24, ND(WEST)                  208400   42566 204  4659800
47 4202 23 BROWN & 22, SD(NE)                       223800   41532 185  4883600
47 4201 28 PENNINGTON & 27, SD(WEST)                220000   43632 198  5103600
51 SOUTH ATLANTIC, LARGE URBAN PSUS
51 0801  1 NEW CASTLE, DE(WILMINGTON)               393300   69580 176   393300
51 0901  1 WASHINGTON, DC                           722700   96272 133  1116000
51 1020  1 BROWARD, FL(FORT LAUDERDALE)             808800  123320 152  1924800
51 1012  1 PINELLAS, FL(ST. PETERSBURG)             640100   86932 135  2564900
51 1013  1 HILLSBOROUGH, FL(TAMPA)                  570800   88421 154  3135700
51 1019  1 PALM BEACH, FL(W. PALM BEACH)            443600   67212 151  3579300
51 1009  1 ORANGE, FL(ORLANDO)                      410200   84591 206  3989500
51 1021  2 DADE-MONROE, FL(MIAMI)                  1468700  226713 154  5458200
51 1005  2 DUVAL-NASSAU, FL(JACKSONVILLE)           577500  106256 183  6035700
51 1106  1 FULTON, GA(ATLANTA)                      580200  122871 211  6615900
51 2106  1 BALTIMORE CITY, MD                       864100   94516 109  7480000
51 3406  1 MECKLENBURG, NC(CHARLOTTE)               373700   66503 177  7853700
51 3408  1 GUILFORD, NC(GREENSBORO)                 299200   58347 195  8152900
51 4711  2 NORFOLK-VIRGINIA BEACH, VA               498400   59410 119  8651300
51 4708  2 RICHMOND-HENRICO, VA                     399300   69257 173  9050600
52 SOUTH ATLANTIC, SMALL URBAN PSUS
52 1014  1 POLK, FL(LAKELAND)                       263200   44376 168   263200
52 1010  1 BREVARD, FL(MELBOURNE)                   229400   43897 191   492600
52 1001  1 ESCAMBIA, FL(PENSACOLA)                  217800   31356 143   710400
52 1007  1 VOLUSIA, FL(DAYTONA BEACH)               199600   39108 195   910000
52 1018  2 LEE-COLLIER,FL(FORT MYERS)               213300   35891 168  1123300
52 1017  2 SARASOTA-CHARLOTTE, FL                   197900   32914 166  1321200
52 1006  7 ALACHUA & 6, FL(GAINESVILLE)             264000   64018 242  1585200
52 1003 10 LEON & 9, FL(TALLAHASSEE)                307300   48606 158  1892500
52 1120  3 CHATHAM & 2, GA(SAVANNAH)                199200   39882 200  2091700
52 1113  4 BIBB & 3, GA(MACON)                      235500   47937 203  2327200
52 1111  4 RICHMOND & 3, GA(AUGUSTA)                204100   29329 143  2531300
52 1115  7 COLUMBUS & 6, GA                         196400   33852 172  2727700
52 1116 10 DOUGHERTY & 9, GA(ALBANY)                212300   41137 193  2940000
52 3409  1 WAKE, NC(RALEIGH)                        256600   40088 156  3196600
52 3407  1 FORSYTH, NC(WINSTON-SALEM)               223200   32207 144  3419800
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52 3415  1 CUMBERLAND, NC(FAYETTEVILLE)        223100    31421 140   3642900
52 3403  2 GASTON-CLEVELAND, NC(GASTONIA)      232500    29533 127   3875400
52 3423  2 DURHAM-ORANGE, NC(DURHAM)           205700    32787 159   4081100
52 3414  4 ALAMANCE & 3, NC(BURLINGTON)        215500    33038 153   4296600
52 3417  4 NEW HANOVER & 3, NC(WILMINGTON)     196700    29463 149   4493300
52 3402  6 BUNCOMBE & 5, NC(ASHEVILLE)         239700    38622 161   4733000
52 4102  1 GREENVILLE, SC                      265300    44781 168   4998300
52 4109  1 CHARLESTON, SC                      260000    38962 149   5258300
52 4106  1 RICHLAND, SC(COLUMBIA)              249300    42756 171   5507600
52 4713  2 NEWPORT NEWS-HAMPTON, VA            263200    34466 130   5770800
52 4710  3 PORTSMOUTH & 2, VA                  258100    31354 121   6028900
52 4704  7 ROANOKE & 6, VA                     247200    38074 154   6276100
52 4706  9 LYNCHBURG & 8, VA                   256200    40779 159   6532300
52 4709 13 PETERSBURG & 12, VA                 216700    38411 177   6749000
52 4901  1 KANAWHA, WV(CHARLESTON)             223700    39791 177   6972700
52 4902  4 CABELL & 3, WV(HUNTINGTON)          199800    30696 153   7172500
52 4907  6 OHIO & 5, WV(WHEELING)              201500    33637 166   7374000
52 4906 12 WOOD & 11, WV(PARKERSBURG)          208000    28407 136   7582000
53 SOUTH ATLANTIC, LARGE SUBURBAN PSUS
53 1107  1 DE KALB, GA(NORTH)                  457000    83314 183    457000
53 1105  1 COBB, GA(NORTH)                     234100    49710 212    691100
53 2104  1 PRINCE GEORGE'S, MD(WASH. METRO)    679200   126109 185   1370300
53 2105  1 BALTIMORE COUNTY, MD                632500   115344 182   2002800
53 2103  1 MONTGOMERY, MD(WASH. METRO)         560300   103922 185   2563100
53 2107  4 ANNE ARUNDEL & 3, MD(BALT. METRO)   472400    84335 178   3035500
53 4717  2 ARLINGTON-ALEXANDRIA, VA(WASH. M)   261500    34039 130   3297000
53 4712  3 FAIRFAX & 2, VA(WASH. METRO)        548600   117291 213   3845600
54 SOUTH ATLANTIC, SMALL SUBURBAN PSUS
54 1008  2 SEMINOLE-LAKE, FL(CEN)              216700    32247 148    216700
54 1011  4 PASCO & 3, FL(WEST)                 207700    32358 155    424400
54 1004 10 CLAY & 9, FL(NE)                    223800    51822 231    648200
54 1109  4 CLAYTON & 3,GA(NC)                  216600    41581 191    864800
54 1108  5 GWINNETT & 4, GA(NC)                206900    32913 159   1071700
54 1101  6 WALKER & 5, GA(NW)                  201900    34133 169   1273600
54 1103  9 CHEROKEE & 8, GA(NORTH)             200400    31958 159   1474000
54 2102  3 FREDERICK-CARROLL-HOWARD, MD(BAL)   266800    49477 185   1740800
54 2106  3 HARFORD-CECIL-KENT, MD(BAL-WIL)     207300    34498 166   1948100
54 3410  4 DAVIDSON & 3, NC(GREENS. METRO)     201600    25995 128   2149700
54 3412  5 RANDOLPH & 4, NC(SC)                226200    27197 120   2375900
54 4103  2 SPARTANBURG-CHEROKEE, SC(GREEN. M   229300    36512 159   2605200
54 4107  2 AIKEN-LEXINGTON, SC(COL.-AUG. M)    205200    28715 139   2810400
54 4111  5 BERKELEY & 4, SC(CHARL. METRO)      199300    29338 147   3009700
54 4716  3 PRINCE WILLIAM & 2, VA(WASH. METR   211800    37062 174   3221500
54 4707  9 CHESTERFIELD & 8, VA(RICH. METRO)   225800    36604 162   3447300
54 4714 16 YORK & 15, VA(N.N.-RICH. METRO)     215700    44312 205   3663000
55 SOUTH ATLANTIC, RURAL LOW GAS SALES PSUS
55 1002  6 OKALOOSA & 5, FL(NW)                220000    33008 150    220000
55 1102  5 FLOYD & 4, GA(NW)                   201300    25133 124    421300
55 1114 11 TROUP & 10, GA(WEST)                188600    26823 142    609900
55 1104 12 HALL & 11, GA(NE)                   210300    31576 150    820200
55 1117 13 COLQUITT & 12, GA(SW)               207600    32173 154   1027800
55 1112 16 LAURENS & 15, GA (CEN)              211000    28257 133   1238800
55 3411  3 ROWAN & 2, NC(CEN)                  214900    32520 151   1453700
55 3405  4 CATAWBA & 3, NC(WC)                 234300    30333 129   1688000
55 3418  4 WAYNE & 3, NC(EC)                   234000    30706 131   1922000
55 3422  5 ONSLOW & 4, NC(EAST)                214000    28540 133   2136000
55 3416  5 ROBESON & 4, NC(SOUTH)              206100    27855 135   2342100
55 3404  6 CALDWELL & 5, NC(NW)                235400    28039 119   2577500
55 3413  6 ROCKINGHAM & 5, NC(NORTH)           216900    28342 130   2794400
55 3421  9 PITT & 8, NC(EAST)                  203600    26913 132   2998000
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55 4105  5 YORK & 4, SC(NORTH)                  224200    29328 130   3222200
55 4112  5 DARLINGTON & 4, SC(NC)               219200    27894 127   3441400
55 4104  8 GREENWOOD & 7, SC(WEST)              222800    30138 135   3664200
55 4701  8 WISE & 7, VA(SW)                     210800    24374 117   3875000
55 4703 10 HENRY & 9, VA(SW)                    282600    37264 131   4157600
55 4908  4 HARRISON & 3, WV(NORTH)              222200    29695 133   4379800
55 4904  4 RALEIGH & 3, WV(SOUTH)               207400    30538 147   4587200
55 4903  6 LOGAN & 5, WV(SW)                    209300    26182 125   4796500
55 4905 13 RANDOLPH & 12, WV(EAST)              208800    30458 145   5005300
56 SOUTH ATLANTIC, RURAL AVERAGE GAS SALES PSUS
56 0802  4 KENT-SUSSEX + 2, DE-MD               217700    37807 173    217700
56 1016  6 MANATEE & 5, FL(SC)                  208500    33489 160    426200
56 1110 14 CLARKE & 13, GA(NC)                  211100    35065 166    637300
56 1119 16 GLYNN & 15, GA(SE)                   242800    41850 172    880100
56 2101  3 WASHINGTON-ALLEGANY-GARRETT, MD(N 213200    37357 175   1093300
56 3419  4 NASH & 3, NC(EC)                     239200    41033 171   1332500
56 3401 11 HENDERSON & 10, NC(SW)               253900    39833 156   1586400
56 3420 11 HALIFAX & 10, NC(NE)                 216700    36778 169   1803100
56 4101  3 ANDERSON & 2, SC(NW)                 224400    35783 159   2027500
56 4108  4 FLORENCE & 3, SC(NE)                 242300    43701 180   2269800
56 4110  9 ORANGEBURG & 8, SC(SC)               243200    39243 161   2513000
56 4702  9 WASHINGTON & 8, VA(SW)               234600    38124 162   2747600
57 SOUTH ATLANTIC, RURAL HIGH GAS SALES PSUS
57 1015  5 ST. LUCIE & 4, FL(EAST)              203300    44374 218    203300
57 1116 17 LOWNDES & 16, GA(SOUTH)              264500    56025 211    467800
57 2109  7 WICOMICO & 6, MD-VA(SE)              202500    33752 161    670300
57 4705 13 AUGUSTA & 12, VA(WEST)               223200    46028 206    893500
57 4715 15 FREDERICKSBURG & 14, VA(CEN)         210700    44149 209   1104200
57 4909 10 BERKELEY + 9, WV-VA(NE)              207500    38361 184   1311700
61 EAST SOUTH CENTRAL, LARGE URBAN PSUS
61 0107  1 JEFFERSON, AL(BIRMINGHAM)            641900    92193 143    641900
61 0114  1 MOBILE, AL                           330600    42423 128    972500
61 1605  1 JEFFERSON, KY(LOUISVILLE)            706000   110635 156   1678500
61 4301  1 SHELBY, TN(MEMPHIS)                  724400   114541 158   2402900
61 4306  1 DAVIDSON, TN(NASHVILLE)              449700    85672 190   2852600
62 EAST SOUTH CENTRAL, SMALL URBAN PSUS
62 0102  2 MADISON-LIME, AL(HUNTSVILLE)         227800    25839 113    227800
62 0110  2 MONTGOMERY-AUTAUGA, AL               211200    37526 177    439000
62 0104  3 CAL-ETOWAH-CHER, AL(GAD-ANNI)        217900    29131 133    656900
62 0101  4 LAUD-COL-LAW-MOR, AL(FLORENCE)       230800    30721 133    887700
62 0106  4 TUSCALOOSA & 3, AL                   211400    29387 139   1099100
62 1613  2 FAYETTE-WOODFORD, KY(LEXINGTON)      202500    40245 198   1301600
62 1602  8 DAVIESS & 7, KY(OWENSBORO)           240000    37335 155   1541600
62 2506  1 HINDS, MS(JACKSON)                   224100    37887 169   1765700
62 2510  4 HARRISON & 3, MS(BILOXI)             201000    27993 139   1966700
62 2511  6 JACKSON & 5, MS(PASCAGOULA)          214200    30764 143   2180900
62 4312  1 KNOX, TN(KNOXVILLE)                  287300    53208 185   2468200
62 4309  1 HAMILTON, TN(CHATTANOOGA)            264800    51554 194   2733000
62 4314  6 SULLIVAN & 5, TN(KINGSPORT)          220900    29653 134   2953900
62 4304 10 MONTGOMERY & 9, TN(CLARKSVILLE)      205200    30713 149   3159100
63 EAST SOUTH CENTRAL, LARGE SUBURBAN PSUS
64 1609  3 BOONE-KENTON-CAMPBELL, KY(CINCI)     251000    49786 198    251000
64 EAST SOUTH CENTRAL, SMALL SUBURBAN PSUS
64 1611 12 BOYD & 11, KY(HUNT. METRO)           206900    26283 127    457900
64 4307  6 WILSON & 5, TN(NASH. METRO)          209800    32197 153    667700
65 EAST SOUTH CENTRAL, RURAL LOW GAS SALES PSUS
65 0103  5 MARSHALL & 4, AL(NE)                 237000    25302 106    237000
65 0111  6 LEE & 5, AL(SE)                      209700    23493 112    446700
65 0112  6 HOUSTON & 5, AL(SE)                  208000    29438 141    654700
65 0108  8 TALLADEGA & 7, AL(EC)                227000    25739 113    881700
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65 0105  9 WALKER & 8, AL(NW)                        215300   25519 118  1097000
65 0109  9 DALLAS & 8, AL(SW)                        198400   23673 119  1295400
65 1612  8 PIKE & 7, KY(EAST)                        213500   22376 107  1508900
65 1606 14 PULASKI & 13, KY(SOUTH)                   219000   31744 144  1727900
65 2503  7 WASHINGTON & 6, MS(WEST)                  205900   22822 110  1933800
65 2531  8 PANOLA & 7, MS(NW)                        215400   24970 115  2149200
65 2505  8 LOWNDES & 7, MS(EAST)                     204500   21667 105  2353700
65 2509 10 ADAMS & 9, MS(SW)                         219200   26815 122  2572900
65 2502 10 LEE & 9, MS(NE)                           214900   31470 146  2787800
65 2508 11 JONES & 10, MS(SE)                        218700   23295 106  3006500
65 2504 12 LEFLORE & 11, MS(NC)                      207000   26980 130  3213500
65 4315  5 WASHINGTON & 4, TN(NE)                    204000   24988 122  3417500
65 4313  5 BLOUNT & 4, TN                            198900   30123 151  3616400
65 4305  8 MAURY & 7, TN(SC)                         207800   31604 152  3824200
65 4303  9 GIBSON & 8, TN(NW)                        238800   34686 145  4063000
65 4308 14 WARREN & 13, TN(SC)                       232600   32600 141  4295600
66 EAST SOUTH CENTRAL, RURAL AVERAGE GAS SALES PSUS
66 0113  7 BALDWIN & 6, AL(SE)                       210100   35563 169   210100
66 1603  9 WARREN & 8, KY(SW)                        219000   39050 178   429100
66 1604 10 HARDIN & 9, KY(NC)                        223400   39380 176   652500
66 1608 10 BELL & 9, KY(SOUTH)                       215100   35105 163   867600
66 1607 12 MADISON & 11, KY(CEN)                     208300   34492 165  1075900
66 1601 13 MCCRACKEN & 12, KY(SW)                    224300   35065 156  1300200
                            +4
66 2507  5 LAUDERDALE, MS(EC)                        199000   32608 164  1499200
66 4311  7 MCMINN & 6, TN(SE)                        206200   32250 156  1705400
66 4302 10 MADISON & 9, TN(SW)                       246100   41864 170  1951500
66 4310 11 ANDERSON & 10, TN(NC)                     232700   37457 160  2184200
67 EAST SOUTH CENTRAL, RURAL HIGH GAS SALES PSUS
67 1610 18 FRANKLIN & 17, KY(NORTH)                  227500   41697 164   227500
71 WEST SOUTH CENTRAL, LARGE URBAN PSUS
71 0406  1 PULASKI, AR(LITTLE ROCK)                  313000   56603 181   313000
71 1912  1 ORLEANS, LA(NEW ORLEANS)                  567300   63383 111   880300
71 1911  1 EAST BATON ROUGE, LA(BATON ROUGE)         309000   43527 141  1189300
71 3708  1 OKLAHOMA, OK(OKLAHOMA CITY)               551000   83267 151  1740300
71 3704  1 TULSA, OK                                 415600   69358 168  2155900
71 4425  1 HARRIS, TX(HOUSTON)                      1899800  237657 156  4055700
71 4409  1 DALLAS, TX                               1376300  235477 171  5432000
71 4406  1 BEXAR, TX(SAN ANTONIO)                    911700  117664 129  6343700
71 4408  1 TARRANT, TX(FORTH WORTH)                  721600  126103 174  7065300
71 4401  1 EL PASO, TX                               410000   51264 125  7475300
71 4407  1 TRAVIS, TX(AUSTIN)                        353500   52268 147  7828800
72 WEST SOUTH CENTRAL, SMALL URBAN PSUS
72 0401  4 SEB-CRAW-WASH-BEN, AR(FT SMITH)           258100   40561 156   258100
72 0407  9 JEFFERSON & 8, AR(PINE BLUFF)             215700   31153 144   473800
72 0405 11 MILLER & 10, AR (TEXARKANA)               213400   34467 151   687200
72 1901  1 CADDO, LA(SHREVEPORT)                     236900   32344 136   924100
72 1905  3 RAPIDES & 2, LA(ALEXANDRIA)               205400   23594 114  1129500
72 1908  4 LAFAYETTE & 3, LA                         275800   41779 151  1405300
72 1906  5 CALCASIEU & 4, LA(LAKE CHARLES)           233700   34125 146  1639000
72 1903  6 OUACHITA & 5, LA(MONROE)                  214900   31136 144  1853900
72 3710 11 COMANCHE & 10, OK(LAWTON)                 256400   38344 151  2110300
72 4405  1 NUECES, TX(CORPUS CHRISTI)                244700   36743 150  2355000
72 4426  1 JEFFERSON, TX(BEAUMONT)                   238300   34520 144  2593300
72 4404  1 HIDALGO, TX(MCALLEN)                      217600   22331 104  2810900
72 4412  2 LUBBOCK & 1, TX                           203800   37569 183  3014700
72 4418  2 BELL-CORYELL, TX(KILLEEN)                 202200   27275 134  3216900
72 4424  3 GALVESTON & 2, TX                         229500   34313 149  3446400
72 4423  4 CAMERON & 3, TX(BROWNSVILLE)              219500   24372 111  3665900
72 4419  4 MCLENNAN & 3, TX(WACO)                    203700   32591 159  3869600
72 4432  4 SMITH & 3, TX(TYLER)                      200000   37440 187  4069600
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72 4430  6 GREGG & 5, TX(LONGVIEW)               221000   47315 182  4290600
72 4428  7 BRAZOS & 6, TX(BRYAN)                 222800   32734 146  4513400
72 4435  8 GRAYSON & 7, TX(SHERMAN)              226000   43118 190  4739400
72 4414  9 POTTER & 8, TX(AMARILLO)              209800   51571 245  4949200
72 4402  9 ECTOR & 8, TX(ODESSA-MIDLAND)         207900   47133 226  5157100
72 4416  9 TAYLOR & 8, TX(ABILENE)               202500   44289 218  5359600
72 4431 10 BOWIE & 9, TX(TEXARCANA)              205400   35908 174  5565000
72 4410 11 WEBB & 10, TX(LAREDO)                 199500   30473 152  5764500
72 4415 12 WICHITA & 11, TX(WICHITA FALLS)       200600   37521 187  5965100
72 4403 23 TOM GREEN & 22, TX(SAN ANGELO)        228300   48130 210  6193400
73 WEST SOUTH CENTRAL, LARGE SUBURBAN PSUS
73 1914  1 JEFFERSON, LA(N.O. METRO)             392300   59061 150   392300
74 WEST SOUTH CENTRAL, SMALL SUBURBAN PSUS
74 1902  7 BOSSIER & 6, LA(NW)                   211500   34413 162   211500
74 3709  5 CLEVELAND & 4, OK(O.C. METRO)         230700   34013 147   442200
74 4434  3 DENTON & 2, TX(DALLAS METRO)          206700   29701 143   648900
74 4421  5 BRAZORIA & 4, TX(HOUSTON METRO)       212300   34112 160   861200
74 4433  6 ELLIS & 5, TX(DALLAS METRO)           204900   41577 202  1066100
74 4420  9 FORT BEND & 8, TX(HOUSTON METRO)      206400   33799 163  1272500
74 4436 11 GUADALUPE & 10, TX(SAN ANT. METRO 210800   36967 175  1483300
75 WEST SOUTH CENTRAL, RURAL LOW GAS SALES PSUS
75 0404  7 CRAIGHEAD & 6, AR(NE)                 210600   32663 152   210600
75 0412 16 POPE & 15, AR(NW)                     219600   30746 140   430200
75 1907  4 ST. LANDRY & 3, LA(SC)                208700   28914 138   638900
75 1909  5 TERREBONNE & 4, LA(SE)                266800   37325 139   905700
75 1913  5 TANGIPAHOA & 4, LA(EAST)              234700   34838 148  1140400
75 1910  9 ASCENSION & 8, LA(SC)                 199700   22511 112  1340100
75 1924 12 NATCHITOCHES & 11, LA(NC)             207200   24384 117  1547300
75 3705  7 MUSKOGEE & 6, OK(EAST)                208200   29430 144  1755500
75 3706 11 PITTSBURG & 10, OK(SE)                204400   30709 146  1959900
76 WEST SOUTH CENTRAL, RURAL AVERAGE GAS SALES PSUS
76 0406  9 GARLAND & 8, AR                       204500   33069 161   204500
76 0403 11 FAULKNER & 10, AR(NC)                 228200   36414 159   432700
76 3702  7 PAYNE & 6, OK(NC)                     216600   35936 163   649300
76 3703  8 WASHINGTON & 7, OK(NE)                202800   34654 171   852100
76 3707 10 POTTAWATOMIE & 9, OK(SC)              222600   36064 162  1074700
76 4427  9 ORANGE & 8, TX(EAST)                  211700   33430 158  1286400
76 4422 10 VICTORIA & 9, TX(SOUTH)               210300   35220 161  1496700
76 4417 15 WILLIAMSON & 14, TX(CEN)              214900   38475 182  1711600
77 WEST SOUTH CENTRAL, RURAL HIGH GAS SALES PSUS
77 0405  7 ST. FRANCIS & 6, AR(EAST)             198400   40556 204   198400
77 3701 16 GARFIELD & 15, OK(NW)                 190600   45933 229   389000
77 4429  8 ANGELINA & 7, TX(EAST)                208100   38036 185   597100
77 4413 23 HALE & 22, TX(NORTH)                  216200   43543 211   813300
77 4411 23 HOWARD & 22, TX(WEST)                 205100   52460 255  1018400
81 MOUNTAIN, LARGE URBAN PSUS
81 0301  1 MARICOPA, AZ(PHOENIX)                1172200  169657 144  1172200
81 0302  2 PIMA-STA. CRUZ(TUCSON)                450600   63958 141  1622800
81 0601  1 DENVER, CO                            501700   72367 144  2124500
81 2901  1 CLARK, NV(LAS VEGAS)                  319600   69326 216  2444100
81 3202  1 BERNALILLO, NM(ALBUQUERQUE)           356600   62520 175  2800700
81 4502  2 SALT LAKE-TOOELE, UT                  522600   79706 152  3323300
82 MOUNTAIN, SMALL URBAN PSUS
82 0602  1 EL PASO, CO(COLORADO SPRINGS)         287800   47768 166   287800
82 0606  2 BOULDER-LARIMER, CO                   276900   35894 129   564700
82 0608 12 PUEBLO & 11, CO                       232400   44280 190   797100
82 0607 12 WELD & 11, CO(GREELEY)                202700   41126 202   999800
82 1302  5 ADA & 4, ID(BOISE)                    234700   36610 156  1234500
82 2702 20 CASCADE & 19, MT(GREAT FALLS)         215400   39613 133  1449900
82 2703 21 YELLOWSTONE & 20, MT(BILLINGS)        225000   51001 226  1674900
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82 2302 19 WASHOE & 18, NV(RENO)                278400   94676 340   1953300
82 4501  2 WEBER-DAVIS, UT(OGDEN)               242800   28455 117   2196100
82 4503 16 UTAH & 15, UT(PROVO)                 284600   59291 208   2480700
83 MOUNTAIN, LARGE SUBURBAN PSUS
83 0605  1 JEFFERSON, CO                        294000   42625 144    294000
83 0603  1 ADAMS, CO                            211700   36673 173    505700
83 0604  1 ARAPAHOE, CO                         205600   31263 152    711300
84 MOUNTAIN, SMALL SUBURBAN PSUS
85 MOUNTAIN, RURAL LOW GAS SALES PSUS
85 0304  5 PINAL & 4 (SE)                       219200   36826 166    219200
86 MOUNTAIN, RURAL AVERAGE GAS SALES PSUS
86 1601 15 NEZ PERCE & 14, ID(NORTH)            219800   36370 165    439000
86 3201 12 SANTA FE & 11, NM(NORTH)             261000   46206 177    700000
87 MOUNTAIN, RURAL HIGH GAS SALES PSUS
87 0303  6 COCONINO & 5,(FLAGSTAFF)             310400   86392 279    310400
87 0609 32 MESA & 31, CO(WEST)                  283200   65275 230    593600
87 1604 12 TWIN FALLS + 9, ID-UT(SOUTH)         204200   38664 189    797800
87 1603 14 BANNOCK & 13, ID(EAST)               215600   40811 169   1013400
87 2701 15 MISSOULA & 14, MT(WEST)              294800   60153 204   1308200
87 3203  9 DONA ANA & 8, NM(WEST)               235100   59218 251   1543300
87 3204 10 CHAVES & 9, NM(EAST)                 268700   59454 221   1812000
87 5101 12 NATRONA & 11, WY(EAST)               217700   54702 251   2029700
87 5102 18 SWEETWATER & 17, WY-UT(WEST)         189500   55363 292   2219200
91 PACIFIC, LARGE URBAN PSUS
91 0524  1 LOS ANGELES, CA                     6926100 1116601 161   6926100
91 0525  1 ORANGE, CA(ANAHEIM)                 1640900  266056 160   8567000
91 0527  1 SAN DIEGO, CA                       1518000  214513 141  10085000
91 0515  1 SANTA CLARA, CA(SAN JOSE)           1181000  184810 156  11266000
91 0512  1 ALAMEDA, CA(OAKLAND)                1089600  172437 158  12375200
91 0522  1 SAN BERNARDINO, CA                   702600  135035 165  13077800
91 0505  1 SACRAMENTO, CA                       687200  110601 160  13765000
91 0509  1 SAN FRANCISCO, CA                    677000   92435 136  14442000
91 0518  1 FRESNO, CA                           439400   75923 172  14881400
91 0523  1 VENTURA, CA                          430200   67629 157  15311600
91 0521  1 KERN, CA(BAKERSFIELD)                337600   79517 235  15649200
91 0526  2 RIVERSIDE-IMPERIAL, CA               592300  109572 184  16241500
91 3803  1 MULTNOMAH, OR(PORTLAND)              538500   97753 161  16780000
91 4804  1 KING, WA(SEATTLE)                   1135200  193682 170  17915200
91 4805  1 PIERCE, WA(TACOMA)                   397600   63169 156  18312800
91 4811  1 SPOKANE, WA                          303600   46758 153  18616400
92 PACIFIC, SMALL URBAN PSUS
92 0513  1 SAN JOAQUIN, CA(STOCKTON)            299200   50855 169    299200
92 0507  1 SONOMA, CA(SANTA ROSA)               242600   44739 184    541800
92 0514  1 STANISLAUS, CA(MODESTO)              211100   33541 158    752900
92 0516  2 SANTA CRUZ-MONTEREY, CA              407800   69127 159   1160700
92 0520  2 SANTA BARBARA-SAN LUIS OB, CA        406800   74537 182   1567500
92 0508  2 SOLANO-NAPA, CA(VALLEJO)             267700   46453 173   1835200
92 3807  1 LANE, OR(EUGENE)                     236600   40011 169   2071800
92 3805  2 MARION-LINN, OR(SALEM)               244000   39274 160   2315800
92 4803  1 SNOHOMISH, WA(EVERETT)               261200   45693 174   2577000
92 4808  4 YAKIMA & 3, WA                       196200   37726 192   2773200
92 4809  7 BENTON & 6, WA(RICHLAND)             201600   30579 151   2974800
93 PACIFIC, LARGE SUBURBAN PSUS
93 0511  1 CONTRA COSTA, CA                     583600   66424 146    583600
93 0510  1 SAN MATEO, CA                        572600   97501 170   1156200
93 0506  1 MARIN, CA                            214200   30973 144   1370400
93 3804  1 CLACKAMAS, OR(PORTLAND METRO)        201000   25134 125   1571400
94 PACIFIC, SMALL SUBURBAN PSUS
94 3802  2 WASHINGTON-COLUMBIA, OR(PORT. M)     222600   32335 145    222600
94 4807  3 CLARK & 2, WA(PORT. METRO)           223800   28455 127    446400
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95 PACIFIC, RURAL LOW GAS SALES PSUS
95 0519  2 TULARE-KINGS, CA(CEN)          279800    41318 152    279800
95 3801  6 BENTON & 5, OR(NW)              217700    33240 152    468500
95 4801  4KITSAP & 3, WA(WEST)             180300    23124 128    66880
96 PACIFIC, RURAL AVERAGE GAS SALES PSUS
96 0503  5 BUTTE & 4, CA(NORTH)            296300    49273 166    296300
96 3809  5 JACKSON & 4,OR(SOUTH)           200700    36557 182    497000
96 4802  4 WHATCOM & 3, WA(NW)             179600    30376 171    67600
97 PACIFIC, RURAL HIGH GAS SALES PSUS
97 0501  4 HUMBOLDT & 3, CA(NW)            202300    37631 186    202300
97 0517  5 MERCED & 4, CA(CEN)             212200    41039 193    41450
97 0504  7 PLACER & 6, CA(NC)              252000    52877 209    666500
97 0502  7 SHASTA & 6, CA(NORTH)           202200    52330 258    868700
97 3808  4 DOUGLAS & 3, OR(SW)             208800    42227 210   108950
97 3806 14 UMATILLA & 13, OR(NE)           204100    45339 222   127360
97 4806  4 THURSTON & 3, WA(WEST)          213600    40635 193   1487200
97 4816  9 GRANT & 8, WA(NE)               183300    34558 189   1670500
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APPENDIX C

USER'S GUIDE FOR CONTROLLED SELECTION PROGRAM

Robert Groves
May 21, 1975

USER'S GUIDE FOR CONTROLLED SELECTION PROGRAM

This program constructs patterns for controlled selection problems with two or three stratifying dimensions. The problem can be inputted with cells representing decimal expectations (e.g., 4.3 means a .3 chance of 5 selections and a .7 chance of 4 selections) or as integer fractions (e.g., 7 means 7/6 = 1.16667).

SETUP

Card No.

1 `$SIGNON CCID T=10SEC`
2 Password
3 `$ RUN SGM8:NUPR    5=*SOURCE*    6=*SINK*`

Card No.	Column	Contents
4	1 - 3	Right-justified, number of categories in I dimension (i.e., the number of subtables excluding the total subtable) Limits $0<I<51$
	4 - 6	Right-justified, number of categories in J dimension (i.e., the number of rows in each subtable, excluding the total row) Limits: $1<J<26$
	7 - 9	Right-justified, number of categories in K dimension (i.e., the number of columns in each subtable, excluding the total column). If a two-dimensional problem leave field blank. Limits: $-1<K<17$
	10 - 17	Right-justified, sum of weights, the number to which table frequencies are relative (e.g., if input frequencies are single place decimal numbers the field is ƀƀƀƀƀƀ10, then a 43 would yield expectation 4.3; if input frequencies are integer fractions, the denominator is entered; e.g., if 1 = 1/6, the field equals ƀƀƀƀƀƀƀ6)
5-end	1 - 8	in fields of 8 columns, the frequencies of the problem, row-by-row in each subtable (if each row has more than 10 cells, continue on the next card. <u>Each row must start on a new card</u>.)
	9 - 16	
	17 - 24	
	25 - 32	
	33 - 40	
	41 - 48	
	49 - 56	
	57 - 64	
	65 - 72	
	73 - 80	

EXAMPLES:

1. The problem has 2 categories on the I dimension, 3 categories on the J dimension, and 2 categories on the K dimension:

I=1

	K=1	K=2	total
J=1	.4	.1	.5
J=2	.5	.2	.7
J=3	.5	.2	.7
total	1.4	.5	1.9

I=2

	K=1	K=2	total
J=1	.1	.2	.3
J=2	.7	.4	1.1
J=3	.3	.4	.7
total	1.1	1.0	2.1

TOTAL

	K=1	K=2	total
J=1	.5	.3	.8
J=2	1.2	.6	1.8
J=3	.8	.6	1.4
total	2.5	1.5	4.0

The Setup cards are:

```
         1         2        3
12345678901234567890234567890
  2  3  2      10
       4       1      5
       5       2      7
       5       2      7
      14       5     19
       1       2      3
       7       4     11
       3       4      7
      11      10     21
       5       3      8
      12       6     18
       8       6     14
      25      15     40
```

2. The problem has 2 categories on I dimension and 10 on J dimension:

	J=1	J=2	J=3	J=4	J=5	J=6	J=7	J=8	J=9	J=10	Total
I=1	$\frac{1}{6}$	0	$\frac{1}{3}$	1	$2\frac{1}{3}$	$1\frac{5}{6}$	$\frac{2}{3}$	$\frac{1}{2}$	0	$\frac{1}{3}$	$7\frac{1}{6}$
I=2	1	$\frac{2}{3}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{6}$	$2\frac{1}{6}$	0	$1\frac{5}{6}$	$\frac{1}{6}$	7
total	$1\frac{1}{6}$	$\frac{2}{3}$	$\frac{1}{2}$	$1\frac{1}{3}$	$2\frac{5}{6}$	2	$2\frac{5}{6}$	$\frac{1}{2}$	$1\frac{5}{6}$	$\frac{1}{2}$	$14\frac{1}{6}$

The Setup cards are:

```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
  2 10          6
       1       0       2       6      14      11       4       3       0       2
      43
       6       4       1       2       3       1      13       0      11       1
      42
       7       4       3       8      17      12      17       3      11       3
      85
```