

RESOURCE ALLOCATION OPTIONS  
FOR  
THE ALABAMA DEPARTMENT OF  
MENTAL HEALTH AND  
MENTAL RETARDATION

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## PROLOGUE

The Alabama Resource Allocation Modeling Project was a strategic planning process. Strategic planning should focus on particular target populations, identify objectives for that planning population, describe alternative means for reaching these objectives, weigh the effectiveness and cost of these various means, and, given current and anticipated resources, suggest new directions for service development.

Strategic plans should not be thought of as the sole product or end point of a strategic planning process. In view of the imperfect planning technologies and information available to planners, strategic plans should be made to be challenged. Thus a strategic plan should only be one step in an ongoing policy process. As such, a strategic plan should stimulate and encourage policy analysis and debate by making explicit the values, causal inferences, and data estimates that go into planning.

The computer implemented resource allocation model used in this report is a new technology. It forces us to confront how little research actually exists to support the causal inferences and parameter estimates that strategic planning requires. Nevertheless, strategic plans must be made if resources are to be invested in other than a totally subjective manner.

In this context, the resource allocation model used has a number of benefits. First, it has the virtue of forcing planners to make explicit their values, causal inferences and data estimates. Second, because of its computer implementation, it allows scenarios that take into account alternative values, causal inferences, and data estimates to be explored and evaluated. Finally, it provides an organizing focus for future planning and research efforts. This focus can result in improved model input and output and can contribute to an ongoing and continually improving strategic planning effort.

This report does not recommend a specific resource allocation strategy for Alabama. Instead, it presents for consideration by policy makers, several productive and efficient possibilities suggested by the resource allocation model. HSRI believes that confidence can be placed in the judgment that these strategies will be more productive and efficient than others.

The specific predictions of the model should be viewed more cautiously and in the context of the baseline application present in the report. A conservative margin of error should be assumed for predictions in regard to client movement, service utilization, or service cost. Moreover, because random errors are more likely to cancel each other out when numbers are larger, the more specific the prediction, the less confidence should be placed in it. In

other words, model predictions probably will be more accurate for all clients, than for clients at a particular functional level, and more accurate for all costs than for costs for a particular service.

HSRI wishes to thank the members of the Alabama Resource Allocation Planning Project task force, who made an extraordinary contribution to this project. In particular, we wish to thank Ingram Gomillion and Greg Carlson, who provided the project with both guidance and support.



SUMMARY

In 1984 the Alabama Department of Mental Health and Mental Retardation (DMH) initiated a comprehensive planning process. The goal of this process is to produce plans and plan updates to assist the DMH in providing cost effective services to Alabama citizens. The planning process is a comprehensive one addressing the areas of child and adult mental health, mental retardation, and substance abuse.

This report describes work to plan adult mental health services carried out by the DMH from September of 1984 to the present. This work was done in collaboration with the Human Services Research Institute (HSRI).

The project involved an enumeration and categorization by functional level of clients of the DMH. Following this alternative groups of services or service packages were designed for clients at the various functional levels. Costs were also developed for each service package. To estimate the effectiveness of each service package a set of outcome measures in the form of transition probabilities selected from a database developed by HSRI was assigned to each package. The current DMH budget for the planning population was also estimated. Given these data, the HSRI Resource Allocation Linear Programming Model was employed to find affordable and cost effective strategies for the DMH. These strategies were refined using the HSRI Resource Allocation Simulation Model.

The components of system cost effectiveness, as determined by the HSRI models, are defined as follows:

- o system cost refers to the total DMH cost of providing, for specified time periods, the services called for in the Alabama service package options.
- o system effectiveness refers to the extent to which client functioning is improved or prevented from deteriorating.

The model application was able to both approximate the current system and to suggest several affordable strategies for the Alabama DMH that should improve system cost effectiveness. First, the strategy coming closest to describing the current system was one that combined "Adaptive" inpatient services (e.g. traditional therapies) with "Basic" (fundamental) community services for the lower functioning clients. For higher functioning clients, "Basic" services best described the present system. The findings further indicated that there may be a shortfall of community residential services, at least in some geographic areas.

The model application produced alternative strategies which pointed to possible new directions for Alabama. These strategies would initially cost more than Alabama is currently spending, but they would be more cost effective. Although the model predicted that system costs would drop over time, those predictions were questioned from observed inaccuracies in the model.

## METHODOLOGY AND RESULTS

### THE PLANNING PROCESS AND TASK FORCE

The Alabama mental health system resource allocation planning project was guided by a task force of mental health professionals convened by the DMH. The task force for this project consisted of the following members:

Horace Allen	Administrative Services Coordinator, Bryce State Hospital, Tuscaloosa
Greg Carlson	DMH Central Planning Section, Administrative Services Division, Montgomery
Dr. James L. Dill	Executive Director, Alabama Council Community Mental Health, Birmingham
Dr. Layton B. Dorman	Executive Director, Jefferson- Blount-St. Clair MH/MR Authority, Birmingham
Dr. John Goff	Chief Psychologist, Bryce State Hospital, Tuscaloosa
Ingram Gomillion	Project Manager, Director of Research and Planning, Administrative Services Division, Montgomery
Dr. Edward Kimbrough	Clinical Director, Searcy State Hospital, Mt. Vernon
Jay Muller	Division of Mental Illness and Substance Abuse Community Programs, Alabama MH/MR Department, Montgomery
Dr. Frazier Rolan	Director of Mental Health Programs, Jefferson-Blount-St. Clair MH/MR Authority, Birmingham
Mary Lee Rice	Director, Division of Community Mental Illness and Substance Abuse Community Programs, Montgomery
Chris Retan	Director, Aletheia House, Birmingham

David Smith	Staff Assistant to the Director, Searcy State Hospital, Mt. Vernon
Jerry Lovett	Director, Northwest Alabama Mental Health Center
Gary Stockdale	Intensive Treatment Director, Eastside Mental Health Center

### THE ALABAMA MENTAL HEALTH SYSTEM

For the purposes of this planning effort, the Alabama mental health system was defined by the task force as including the community mental health centers and Bryce, Searcy, Northern Alabama Regional, Greil, and the Thomasville Adult Adjustment Center. A list of the sites from which data were collected, the number of cases sampled at each site, and the total client enrollment at each site are shown in Table 1.

### DATA COLLECTION

Six types of input information had to be developed for use by the model:

1. Numbers of clients, by functional level, currently in the mental health system ("snapshot").
2. Numbers of clients, by functional level, arriving to the system (arrivals).
3. For each functional level, descriptions of service package option (SPO) components, and costs.
4. Estimates of SPO effectiveness (transition probabilities).
5. An estimate of the current Alabama DMH budget for the planning population.
6. Statements of system objectives.

TABLE 1  
SAMPLE (UNADJUSTED) BY SITE

NAME	#	CURRENT #	ARRIVAL #	TOTAL	CASES 1/25	CUR/CASES
RIVERBEND	1	72	19	91	923	7.80%
NORTH CENTRAL	2	58	15	73	864	6.71%
HUNTSVILLE*	3	117	30	146	1207	9.66%
NORTHWEST	4	62	19	81	589	10.53%
JBS AUTHORITY	5	50	0	50	271	18.45%
WESTERN	5	121	11	132	1508	8.02%
EASTSIDE	5	97	32	129	1010	9.60%
UAB	5	181	41	222	2268	7.98%
CEB	6	4	25	29	988	0.40%
CALHOUN/CLEBUR	7	95	7	102	839	11.32%
INDIANS RIVERS	8	126	29	155	1273	9.90%
CHEAMA	9	133	39	172	764	17.41%
WEST ALA	10	29	10	39	366	7.92%
CHILTON SHELBY	11	67	5	72	384	17.45%
EAST ALA	12	147	55	202	1421	10.34%
CAHABA	13	93	19	112	730	12.74%
MONTGOMERY	14	118	33	151	1451	8.13%
EAST CENTRAL	15	44	16	60	617	7.13%
MOBILE	16	201	45	246	2204	9.12%
SOUTHWEST	17	50	15	65	474	10.55%
SOUTH CENTRAL	18	10	31	41	655	1.53%
WIREGRASS	19	163	22	185	1208	13.49%
MARSHALL/JACK	20	52	14	66	823	6.32%
BALDWIN	21	38	10	48	406	9.36%
SUB TOTAL		2128	542	2669	23243	9.15%
BRYCE		1261	40	1301		
SEARCY		650	17	667		
NARH		125	7	132		
GREIL		48	2	50		
TAAC		157	0	157		
SUB TOTAL		2241	66	2307		
TOTAL		4369	608	4976		

\* Data for Huntsville estimated

## THE PLANNING POPULATION

The planning population for this project was defined as those persons aged 19 and over, with mental illness, either currently in the Alabama mental health system or likely to become clients in the next three years (the planning time period or horizon). Forensic inpatients were excluded by the planning task force because their court involvement was deemed to require special planning.

## THE CLIENT DATA FORM

Working in consultation with the task force, HSRI developed a client data instrument for the data collection. One form was completed for each client in the target sample by a clinician or case manager knowledgeable about the client in question. The form consisted of 11 items which required the person filling out the form to rate the client's functional level using the Resource Allocation Functional Level Scale, and to provide certain other demographic and clinical information. The data items included in the form are shown in Exhibit 1.

A copy of the Resource Associated Functional Level Scale is shown in Exhibit 2. This scale has been shown to have good inter-rater reliability when used by coders given minimal training (Leff, Cohler, Swartz, and Shlessinger, 1985).

EXHIBIT 1

ALABAMA CLIENT DATA FORM

CURRENT ARRIVAL ( )

FOR CODING

1) PROGRAM/FACILITY: \_\_\_\_\_

INPATIENT ( ) RESIDENTIAL ( ) OUTPATIENT TX ( )  
DAY TX ( ) DAY ACTIV. ( )

( ) ( ) ( )  
1 2 3

2) CASE NUMBER: \_\_\_\_\_ 3) AGE: \_\_\_\_\_

4) SEX:

MALE	1
FEMALE	2

( )  
4

( )  
5

5) LAST KNOWN OR CURRENT COUNTY OF RESIDENCE: \_\_\_\_\_

( )  
6

6) IF INPATIENT, COUNTY IN WHICH CLIENT INTENDS TO LIVE AFTER DISCHARGE: \_\_\_\_\_

( ) ( ) ( )  
7 8 9

7) PRINCIPAL DIAGNOSIS:

SCHIZOPHRENIA	1
AFFECTIVE DISORDER PSYCHOTIC	2
AFFECTIVE DISORDER NONPSYCHOTIC	3
PERSONALITY DISORDER	4
ORGANIC BRAIN SYNDROME	5
SUBSTANCE ABUSE	6
OTHER: (SPECIFY) _____	7

( ) ( ) ( )  
10 11 12

( )  
13

8) SECONDARY DIAGNOSIS:

SCHIZOPHRENIA	1
AFFECTIVE DISORDER PSYCHOTIC	2
AFFECTIVE DISORDER NONPSYCHOTIC	3
PERSONALITY DISORDER	4
ORGANIC BRAIN SYNDROME	5
SUBSTANCE ABUSE	6
OTHER: (SPECIFY) _____	7
NONE	8

( )  
14

9) AXIS III DX/MEDICAL (3 MOST SIGNIFICANT)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

10) FUNCTIONAL LEVEL:

\*See attached copy of RAFLS to assist coding.

DANGEROUS/UNABLE/UNWILLING COOPERATE	A
UNABLE TO FUNCTION DUE TO SYMPTOMS	B
LACKS ADL/PERSONAL CARE SKILLS	C
LACKS COMMUNITY LIVING SKILLS	D
NEEDS ROLE SUPPORT/TREATMENT FOR ROUTINE STRESS	E
NEEDS ROLE SUPPORT/TREATMENT FOR EXTREME STRESS	F1
FUNCTIONS ADEQUATELY BUT SEEKS TX	F2
SYSTEM INDEPENDENT	G

( )  
15

11) MENTAL HEALTH TREATMENT IN DMH SYSTEM on 1/29/85 (FOR ARRIVALS ONLY)

YES	1
NO	2

DMH FACILITY	1
CMHC/CMHC FACILITY	2

( ) ( )  
16 17

12) NAME AND TELEPHONE NUMBER OF PERSON FILLING OUT THIS FORM: \_\_\_\_\_

- (1) Dangerous  
Danger to self, others, or property of value. Unable or unwilling to control violent, aggressive, or escape-seeking behavior. Requires continuous (24-hour) supervision, high staff/patient ratio, locked or limited-access facility.
- (2) Unable to Function, Current, Psychiatric Symptoms (Acute)  
If suicidal or homicidal, is able/willing to control impulses with assistance. Symptoms result in behavior that is seriously disruptive or dangerous, and/or prevent role functioning. Examples of symptoms: lack of reality testing, hallucinations or delusions, impaired judgment, impaired communication, or manic behavior. May be able to carry out some activities of daily living. Requires continuous supervision, moderate staff/patient ratio, limited-access facility.
- (3) Lacks ADL/Personal Care Skills  
Symptoms no longer result in behavior that is seriously disruptive or dangerous. (Nuisance behaviors should not be considered seriously disruptive or dangerous). Lacks sufficient ADL and/or personal care skills to carry out role functions. Skills lacking because: 1) never mastered, or 2) atrophied through disuse from: creation of extreme dependency, neglect, lack of motivation. Requires continuous (24-hour) prompting, skill training, and encouragement. Moderate staff/patient ratio needed.
- (4) Lacks Community Living Skills  
Able to carry out ADL personal care skills. Role functioning impaired by lack of community living skills, such as: housekeeping, money management, using public transportation, ability to engage in competitive employment, maintaining interpersonal contacts. Require regular and substantial (e.g., 2 or more hours per day), but not necessarily continuous training, prompting, and encouragement.
- (5) Needs Role Support and or Training  
Can perform role functions, at least minimally, in familiar settings and with frequent support to deal with the ordinary stresses of everyday life; e.g., can perform housekeeping tasks, although may need the regular assistance of a roommate, homemaker-aid, etc., or can work outside of sheltered situations with an understanding employer or on-site support or counseling. Becomes dysfunctional under the stresses associated with the frustrations of everyday life and novel situations. Requires frequent (e.g., weekly) information, encouragement, and instrumental assistance.
- (6) Needs Support/Treatment to Cope with Extreme Stress or Seeks Treatment to Maintain or Enhance Personal Development
  - (a) Can perform role functions adequately except under extreme or unusual stress. At these times, the support of natural or generic helpers such as: family, friends, clergy, or physician, is not sufficient. Mental health services required for the duration of stress.
  - (b) Can perform role functions adequately, but seeks mental health services because of feelings of persistent dissatisfaction with self or personal relationships. Intensity and duration of treatment can vary.
- (7) Systems Independent  
Can obtain support from natural helpers or generic services. Does not require or seek mental health services.



HSRI staff trained case managers and clinicians at a one day meeting in Birmingham how to complete the client data form. Instructions were provided both orally and in writing. Questions raised during the data collection process were referred to either DMH Central Office staff or HSRI.

#### **SAMPLING METHOD FOR ESTIMATING CLIENTS IN THE SYSTEM AND TREATED ARRIVAL RATES**

##### **Clients in the System**

To estimate the number and functional levels of planning population clients in the Alabama mental health system at the start of planning period, the Client Data Form was used to take a "snapshot" of 100% of clients in the state hospitals and approximately 10% of clients in community mental health centers on January 15, 1985.

##### **Arrival Rates**

To estimate the rate at which clients in the planning population arrive for service from the Alabama mental health system, Client Data Forms were completed over a two week period, beginning January 16, 1984, for 100% of persons arriving for service at sites defined as in the system.

Clients were assigned a functional level which reflected their level of functioning on the day they arrived in the system and not at the time that the client data form was filled out.

To avoid double counting clients, client records were checked to insure that clients who were in the system at one site on January 15 and who arrived for service at another in the period from January 15 through January 29 were excluded from the count of arrivals. This was necessary because movement by clients in the snapshot data is assumed by the planning models.

### **Latent Demand**

In addition to those clients in and arriving to the mental health system there is a pool of persons who qualify to be in the planning population, but who, for various reasons, do not receive services. This pool is often referred to as the latent demand. The latent demand constitutes a potential source of new demand for services which is often induced to become "expressed" demand when additional or more accessible or acceptable services are implemented. Therefore, it is desirable to estimate the extent of the latent demand so that policy decisions about how it should be served can be anticipated. Where resources are abundant a decision to serve some or all of the latent demand can be made. Where resources are in short supply, limitations must be placed on services to meet this demand.

Latent demand can be operationally defined as the difference between the total number of persons who qualify to be in the planning population minus the number who are actually receiving services at some point in time. The

latter number can be projected for any planning period using the HSRI model. HSRI has developed a method for estimating the total number of chronically mentally ill persons in a state. At the present time the data needed for HSRI to estimate Alabama's latent demand are not available. Once the data for are available, HSRI will estimate the latent demand for various time periods so that the policy implications of this demand can be considered. These analyses will be presented in a supplemental report.

#### **CLIENTS IN AND ARRIVING TO THE MENTAL HEALTH SYSTEM: RESULTS**

Table 2 shows, for inpatient and community based ambulatory services, the number of clients at each functional level in the Alabama mental health system on the day of the snapshot, and the number arriving in the two week arrival study.

The next tables are presented to provide a more multi-dimensional picture of the clients at each functional level. Table 3 presents, for the sample of inpatients currently in the system, the distribution of diagnoses for each functional level. Table 4 shows the same information for the sample of current CMHC clients, -- persons who were clients of the Alabama system on the day of the "snapshot." Tables 5 and 6 indicate the distribution of diagnoses by functional level for the two week sample of persons arriving to state inpatient units and CMHCs, respectively .

TABLE 2  
 CLIENTS ARRIVING TO AND IN SYSTEM BY FUNCTIONAL LEVEL  
 BY FACILITY TYPE  
 (ADJUSTED)

FUNCTIONAL LEVEL	HOSPITAL				CHIC				TOTAL ARRIVING		TOTAL CURRENT	
	ARRIVING CLIENTS		CURRENT CLIENTS		ARRIVING CLIENTS		CURRENT CLIENTS		NUMBER	PERCENT	NUMBER	PERCENT
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT				
1 DANGEROUS	26	20%	117	5%	51	5%	368	2%	77	6%	485	2%
2 UNABLE TO FUNCTIONS DUE TO SYMPTOMS	74	56%	935	42%	83	8%	2090	9%	157	13%	3025	12%
3 LACKS ACTIVITY OF DAILY LIVING SKILLS	4	3%	572	26%	61	6%	1759	8%	65	5%	2331	9%
4 LACKS COMMUNITY LIVING SKILLS	6	5%	317	14%	97	9%	3835	16%	103	8%	4152	16%
5 NEEDS ROLE SUPPORT	20	15%	208	9%	250	23%	7852	34%	270	22%	8060	32%
6 SEEKS TREATMENT	2	2%	82	4%	496	46%	7154	31%	498	41%	7236	28%
7 MENTAL HEALTH SYSTEM INDEPENDENT	0	0%	10	0%	42	4%	206	1%	42	3%	216	1%
TOTAL	132	100%	2241	100%	1080	100%	23264	100%	1212	100%	25505	100%

TABLE 3

FUNCTIONAL LEVELS BY DIAGNOSIS  
FOR INPATIENTS-"CURRENT"  
(UNADJUSTED)

FUNCTIONAL LEVEL	DIAGNOSIS															
	SCHIZ.		AFFECT. PSYCHO.		AFFECT. NONPSY.		PERSON. DISORDER		ORGAN- ICITY		SUB. ABUSE		OTHER		TOTAL	
	N	% FL	N	% FL	N	% FL	N	% FL	N	% FL	N	% FL	N	% FL	N	% FL
A(1) DANGEROUS	67	63%	11	10%	2	2%	2	2%	9	9%	2	2%	13	12%	106	100%
B(2) UNABLE TO FUNCTION DUE TO SYMPTOMS	568	61%	94	10%	8	1%	12	1%	189	20%	5	1%	58	6%	934	100%
C(3) LACKS ACTIVITY OF DAILY LIVING SKILLS	304	53%	24	4%	13	2%	10	2%	158	28%	6	1%	57	10%	572	100%
D(4) LACKS COMMUNITY LIVING SKILLS	195	62%	24	8%	8	3%	12	4%	31	10%	8	3%	39	12%	317	100%
E(5) NEEDS ROLE SUPPORT	91	44%	38	18%	18	8%	9	4%	12	6%	8	4%	32	15%	208	100%
F(6) SEEKS TREATMENT	29	36%	10	12%	14	17%	3	4%	4	5%	6	7%	15	19%	81	100%
G(7) MENTAL HEALTH SYSTEM INDEPENDENT	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
TOTAL	1254		201		63		48		403		35		214		2218	

TABLE 4  
 FUNCTIONAL LEVELS BY DIAGNOSIS  
 FOR CMHC CLIENTS-"CURRENT"  
 (UNADJUSTED)

FUNCTIONAL LEVEL	DIAGNOSIS															
	SCHIZ.		AFFECT. PSYCHO.		AFFECT. NONPSY.		PERSON. DISORDER		ORGAN- ICITY		SUB. ABUSE		OTHER		TOTAL	
	N	% FL	N	% FL	N	% FL	N	% FL	N	% FL	N	% FL	N	% FL	N	% FL
A(1) DANGEROUS	20	56%	0	0%	2	6%	0	0%	4	11%	6	6%	8	22%	36	100%
B(2) UNABLE TO FUNCTION DUE TO SYMPTOMS	101	60%	14	8%	17	10%	5	3%	15	9%	6	4%	11	7%	169	100%
C(3) LACKS ACTIVITY OF DAILY LIVING SKILLS	121	71%	8	5%	10	6%	3	2%	12	7%	1	1%	15	9%	170	100%
D(4) LACKS COMMUNITY LIVING SKILLS	180	57%	34	11%	27	9%	20	6%	15	5%	5	2%	33	11%	314	100%
E(5) NEEDS ROLE SUPPORT	241	34%	57	8%	126	18%	53	8%	18	3%	14	2%	193	28%	703	100%
F(6) SEEKS TREATMENT	88	15%	32	5%	129	22%	52	9%	7	1%	18	3%	268	45%	594	100%
G(7) MENTAL HEALTH SYSTEM INDEPENDENT	1	6%	0	0%	0	0%	2	11%	0	0%	1	6%	14	78%	18	100%
TOTAL	751		145		311		133		71		50		528		1986	

TABLE 5

FUNCTIONAL LEVELS BY DIAGNOSIS  
FOR INPATIENTS-"ARRIVALS"  
(ADJUSTED TO ONE MONTH)

FUNCTIONAL LEVEL	DIAGNOSIS															
	SCHIZ.		AFFECT. PSYCHO.		AFFECT. NONPSY.		PERSON. DISORD.		ORGAN- ICITY		SUB. ABUSE		OTHER		TOTAL	
	% N	% FL	% N	% FL	% N	% FL	% N	% FL	% N	% FL	% N	% FL	% N	% FL	% N	% FL
A(1) DANGEROUS	14	54%	6	23%	2	8%	0	0%	2	8%	0	0%	2	8%	13	100%
B(2) UNABLE TO FUNCTION DUE TO SYMPTOMS	36	49%	12	16%	4	5%	0	0%	6	8%	6	8%	10	14%	37	100%
C(3) LACKS ACTIVITY OF DAILY LIVING SKILLS	4	100%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	4	100%
D(4) LACKS COMMUNITY LIVING SKILLS	2	33%	0	0%	0	0%	0	0%	0	0%	0	0%	4	67%	6	100%
E(5) NEEDS ROLE SUPPORT	0	0%	0	0%	2	11%	0	0%	2	11%	10	56%	4	22%	18	100%
F(6) SEEKS TREATMENT	0	0%	0	0%	0	0%	0	0%	0	0%	2	100%	0	0%	2	100%
G(7) MENTAL HEALTH SYSTEM INDEPENDENT	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	100%
TOTAL	56		18		8		0		10		18		20		80	

TABLE 6

FUNCTIONAL LEVELS BY DIAGNOSIS  
FOR CMHC CLIENTS-"ARRIVALS"  
(ADJUSTED TO ONE MONTH)

FUNCTIONAL LEVEL	DIAGNOSIS															
	SCHIZ.		AFFECT. PSYCHO.		AFFECT. NONPSY.		PERSON. DISORDER		ORGAN- ICITY		SUB. ABUSE		OTHER		TOTAL	
	% N	% FL	% N	% FL	% N	% FL	% N	% FL	% N	% FL	% N	% FL	% N	% FL	% N	% FL
A(1) DANGEROUS	14	29%	4	8%	6	13%	2	4%	10	21%	2	4%	10	21%	48	100%
B(2) UNABLE TO FUNCTION DUE TO SYMPTOMS	18	23%	14	18%	18	23%	2	3%	6	8%	6	8%	14	18%	78	100%
C(3) LACKS ACTIVITY OF DAILY LIVING SKILLS	18	31%	2	3%	8	14%	2	3%	4	7%	6	10%	18	31%	58	100%
D(4) LACKS COMMUNITY LIVING SKILLS	16	17%	4	4%	20	22%	4	4%	10	11%	6	7%	32	35%	92	100%
E(5) NEEDS ROLE SUPPORT	18	8%	8	3%	56	24%	34	15%	6	3%	12	5%	100	43%	234	100%
F(6) SEEKS TREATMENT	12	3%	0	0%	94	20%	34	7%	8	2%	24	5%	292	63%	464	100%
G(7) MENTAL HEALTH SYSTEM INDEPENDENT	0	0%	0	0%	4	10%	2	5%	0	0%	0	0%	34	85%	40	100%
TOTAL	96		32		202		78		44		56		466		974	



Shown in Table 7, for the sample of current inpatients, are breakdowns by age for each functional level. Table 8 provides similar data for the sample of current CMHC clients. Tables 9 and 10 show these data for for the two week sample of arrivals to state hospitals and CMHC's, respectively.

### SERVICE PACKAGE OPTIONS

Together with HSRI project staff the task force developed a list of all those services that clients of the Alabama mental health system might need. Table 11 lists these services and provides definitions for each. DMH unit costs were also estimated for each of these services.

The planning task force then developed service packages for each functional level to reflect three possible levels of service comprehensiveness and intensity: Basic, Adaptive, and Promotive. These levels are described in detail below. Table 12 presents an overview of the service package component costs and units of service for each functional level and service package option. (Note that the costs shown are therefore not total social costs. Total social costs would be the costs to all agencies, institutions, and individuals of the services shown, and the costs of infrastructure services such as police and fire protection.) A more detailed description of each service package option is contained in Appendix A.

TABLE 7

FUNCTIONAL LEVEL BY AGE  
FOR INPATIENTS-"CURRENT"  
(UNADJUSTED)

FUNCTIONAL LEVEL	AGE										
	19 TO 34			35 TO 64			65 AND OVER			TOTAL	
	N	% FL	% 19-34	N	% FL	% 35-64	N	% FL	% 65+	N	% FL
A(1) DANGEROUS	41	38%	6%	50	47%	5%	16	15%	3%	107	100%
B(2) UNABLE TO FUNCTION DUE TO SYMPTOMS	237	25%	34%	406	43%	41%	292	31%	52%	935	100%
C(3) LACKS ACTIVITY OF DAILY LIVING SKILLS	122	21%	18%	249	44%	25%	201	35%	36%	572	100%
D(4) LACKS COMMUNITY LIVING SKILLS	137	43%	20%	137	43%	14%	43	14%	8%	317	100%
E(5) NEEDS ROLE SUPPORT	102	49%	15%	96	46%	10%	10	5%	2%	208	100%
F(6) SEEKS TREATMENT	43	52%	6%	38	46%	4%	1	1%	0%	82	100%
G(7) MENTAL HEALTH SYSTEM INDEPENDENT	5	50%	1%	4	40%	0%	1	10%	0%	10	100%
TOTAL	687		100%	980		100%	564		100%	2231	

TABLE 8

FUNCTIONAL LEVEL BY AGE  
FOR CMHC CLIENTS-"CURRENT"  
(UNADJUSTED)

FUNCTIONAL LEVEL	AGE										TOTAL	
	19 TO 34			35 TO 64			65 AND OVER					
	N	% FL	% 19-34	N	% FL	% 35-64	N	% FL	% 65+	N	% FL	
A(1) DANGEROUS	12	33%	1%	19	53%	2%	5	14%	4%	36	100%	
B(2) UNABLE TO FUNCTION DUE TO SYMPTOMS	71	42%	9%	86	51%	8%	12	8%	7%	169	101%	
C(3) LACKS ACTIVITY OF DAILY LIVING SKILLS	60	35%	7%	90	53%	8%	20	12%	16%	170	100%	
D(4) LACKS COMMUNITY LIVING SKILLS	130	41%	16%	163	52%	15%	22	7%	17%	315	100%	
E(5) NEEDS ROLE SUPPORT	246	35%	31%	414	59%	39%	44	6%	35%	704	100%	
F(6) SEEKS TREATMENT	273	46%	34%	297	50%	28%	24	4%	19%	594	100%	
G(7) MENTAL HEALTH SYSTEM INDEPENDENT	12	67%	1%	6	33%	1%	0	0%	0%	18	100%	
TOTAL	804		100%	1075		100%	127		98%	2006		

TABLE 9

FUNCTIONAL LEVEL BY AGE  
FOR INPATIENTS-"ARRIVAL"  
(ADJUSTED TO ONE MONTH)

FUNCTIONAL LEVEL	AGE										TOTAL	
	19 TO 34			35 TO 64			65 AND OVER			N	%	
	N	% FL	% 19-34	N	% FL	% 35-64	N	% FL	% 65+			
A(1) DANGEROUS	18	69%	28%	8	31%	14%	0	0%	0%	26	100%	
B(2) UNABLE TO FUNCTION DUE TO SYMPTOMS	22	30%	34%	42	57%	75%	10	14%	83%	74	100%	
C(3) LACKS ACTIVITY OF DAILY LIVING SKILLS	2	50%	3%	2	50%	4%	0	0%	0%	4	100%	
D(4) LACKS COMMUNITY LIVING SKILLS	6	100%	9%	0	0%	0%	0	0%	0%	6	100%	
E(5) NEEDS ROLE SUPPORT	14	70%	22%	4	20%	7%	2	10%	17%	20	100%	
F(6) SEEKS TREATMENT	2	100%	3%	0	0%	0%	0	0%	0%	2	100%	
G(7) MENTAL HEALTH SYSTEM INDEPENDENT	0	0%	0%	0	0%	0%	0	0%	0%	0	0%	
TOTAL	64		100%	56		100%	12		100%	132		

TABLE 10

FUNCTIONAL LEVEL BY AGE  
FOR CMHC CLIENTS--"ARRIVALS"  
(ADJUSTED TO ONE MONTH)

FUNCTIONAL LEVEL	AGE										TOTAL	
	19 TO 34			35 TO 64			65 AND OVER					
	N	% FL	% 19-34	N	% FL	% 35-64	N	% FL	% 65+	N	% FL	
A(1) DANGEROUS	20	42%	4%	20	42%	5%	8	17%	20%	48	100%	
B(2) UNABLE TO FUNCTION DUE TO SYMPTOMS	26	33%	5%	46	59%	11%	6	8%	15%	78	100%	
C(3) LACKS ACTIVITY OF DAILY LIVING SKILLS	24	41%	4%	30	52%	7%	4	7%	10%	58	100%	
D(4) LACKS COMMUNITY LIVING SKILLS	54	59%	9%	32	35%	8%	6	7%	15%	92	100%	
E(5) NEEDS ROLE SUPPORT	140	59%	25%	88	37%	21%	8	3%	20%	236	100%	
F(6) SEEKS TREATMENT	282	60%	49%	180	39%	44%	6	1%	15%	468	100%	
G(7) MENTAL HEALTH SYSTEM INDEPENDENT	24	60%	4%	14	35%	3%	2	5%	5%	40	100%	
TOTAL	570		100%	410		100%	40		100%	1020		

TABLE 11

## SERVICE COMPONENT DEFINITIONS

RESIDENTIAL SERVICES

1. **Intensive Treatment:** A 24-hour per day hospital-type treatment of the acutely psychotic person provided in state hospitals, general hospitals, and crisis stabilization units.
2. **Assisted Living Alternative -- Hospital:** A residential facility on state hospital grounds providing care, rehabilitative activities, and living space for persons so disabled as to be unable to live independently.
3. **Nursing Home:** The term "nursing home" shall mean nursing home, rest home, convalescent home, and related institution regardless of what they are named or called, which provide chronic and/or convalescent care for not less than twenty-four (24) hours in any one week to two or more individuals not related by blood or marriage to the owner and/or administrator. Chronic and/or convalescent care includes care given because of prolonged illness or defect, or during recovery from injury or disease and shall include any or all of the procedures commonly employed in waiting on the sick, such as administration of medicines, preparation of special diets, giving of bedside care, application of dressings and bandages, and carrying out of treatment prescribed by a physician. Nursing homes shall be classified as "Skilled Nursing Homes" and "Nursing Home."
4. **Transitional/Group Home:** A certified residential facility operated and staffed by a community mental health center under a contract with the Department of Mental Health/Mental Retardation. The home provides eligible clients with a short-term intensive program. This program generally is directed at enabling clients to live more independently in the community by offering a service program including vocational, education, social, recreational, and community integration activities. This facility is staffed to provide 24 hour per day coverage and designed to provide support and active rehabilitation programming but less than constant supervision for clients who are not so symptomatic and/or socially disabled.
5. **Intensively Staffed Transitional Home:** A certified residential facility with 3 shifts per day, capable of providing around the clock support and supervision and might house patients with significant residual psychiatric symptoms and/or social deficits, perhaps as they are coming out of the hospital but not yet in total remission.

6. **Foster Home:** A certified facility operated by a responsible individual to provide room, board, transportation and recreation for former institutional patients. Various levels of supervision are provided by different foster homes in accordance with the needs of the clients. Support services (medical, psychological, social and vocational) are provided by appropriate community resources. Foster homes vary in size (2 to 20 clients) and program (custodial to transitional).
7. **Boarding Home:** A facility which provides, for a fee, room and board for three (3) or more persons nineteen (19) years of age or older, not related to the owner or manager by blood or marriage, and who do not require the medical and nursing service provided by a nursing home. In the boarding home there may be available general supervision, social activity, and other limited supportive services as well as limited medical attention of the nature an individual would receive if he/she were living in his/her own home.
8. **Assisted Living Alternative -- Community:** A residential facility in the community providing care, rehabilitative activities, and living space for persons so disabled as to be unable to live independently.
9. **Cooperative Apartments:** An apartment complex of several units with frequent staff visits to provide necessary supportive content and monitoring of functioning and treatment. Access to social, recreation, and other community resources is provided.
10. **Independent Living:** a living situation such as support apartments wherein the client lives virtually independent of the service system, but has frequent contact with case managers or other staff in situations requiring outside support and/or interventions.

#### TREATMENT SERVICES

1. **Outpatient Psychotherapy:** Includes the following services provided by public or private organizations and as defined by DMH/MR:
  - Individual Therapy
  - Family Therapy
  - Collateral Contract
  - Psychological Testing/Assessment
  - Group Therapy

2. **Emergency Crisis Intervention:** The availability of trained staff person(s) to assist and support patients and clients during period of acute symptomatology or requiring immediate attention; services include telephone crisis work as well as emergency room contact.
3. **Day Treatment:** A milieu treatment program which is goal oriented, has written admissions and continuation criteria and has the expectation that the client will improve. Clients must have a psychiatric diagnosis and must be involved in scheduled activities and therapy sessions within a structured program.
4. **Day Activity:** A stabilization, resocialization and maintenance program which involves the clients in activities which include custodial care, nutrition, medical checks, and skill building activities.
5. **Medication Maintenance:** Scheduled periodic evaluation of clients/patients with regard to their medication treatment by a physician and other trained medical personnel.
6. **Medical/Dental:** Scheduled and "as needed" medical and dental care.

#### REHABILITATION SERVICES

1. **Sheltered Workshop:** A facility designed to focus on establishing and maintaining work skills with emphasis on maintaining self-help and community adjustment skills. Also might include a work station for disabled clients actually performing work tasks in industry.
2. **Work Station Industry:** A program providing employment and training opportunities in an actual production situation in an industry or other private concern. Generally individuals earn wages based upon their level of production.
3. **Job Placement:** The location of possible jobs in the job market consistent with the abilities and aptitudes of the patient/client. May include actual training programs to acquire needed skills.
4. **Evaluation:** Includes the process of the identification of vocational skills and aptitudes of patients/clients through the administration and scoring of vocational assessment instruments.
5. **Daily Living Training:** Specialized training programs for patients to regain skills in daily living for purpose of acquiring those social and personal care skills necessary to live as independently as possible.



SUPPORT SERVICES

1. **Case Management:** Case management is the activity of providing and assuring continuity of care for those whose mental disability and living situation prevent them from utilizing resources within themselves, within their living situation, and/or within their communities so that they function in a healthy, appropriate way. Case management includes information, referral, advocacy, needs assessment, case planning, arrangement of transportation for the client, monitoring of the client's progress and redetermination of a client's unmet service needs.
2. **Social Club:** A designed activities program to allow for recreational and social development of patients usually away from their living situations.
3. **Family Support:** Services provided by qualified staff in the client's home or other location, which emphasizes skills development of family members that they can use in caring for the patient.
4. **Probate Court Liaison:** This includes a qualified professional by agreement of the center and Probate Court, to act as liaison between the Court and the community mental health system. The Probate Court Liaison's main function is to assist families (petitioners) who seek commitment to the State institutions by exploring community alternatives and coordinating the activities of the Court, the local mental health professionals, and the State Department of Mental Health institutions when inpatient care is indicated.
5. **Hospital/Community Liaison:** A program designed to assist in pre-discharge planning for all patients returning from the hospital to the community and to assure that a continuum of services is available to all patients upon return.
6. **Residential Assistance Service:** A program to provide assistance to disabled individuals in locating temporary or permanent housing consistent with their income and disabilities.

It is important to remember, also, that the terms Basic, Adaptive, and Promotive, refer primarily to the range of services in a service package, and not to the therapeutic quality of their component services. For example, the institutional care that Basic service packages include may be of high quality. However, Basic service packages lack community based residential, vocational, and treatment alternatives to institutional care. For this reason, their rehabilitative potential is judged to be less than that of Promotive services.

#### **Basic Service Package Options**

Basic service packages include the services needed to assure the health and safety of clients and communities. Basic services can include room, board, physical health care, and psychoactive medications. While various forms of psychotherapy and rehabilitation may be provided in Basic service packages, the services provided are, on the whole, neither community based nor intensive.

#### **Adaptive Service Package Options**

Adaptive service packages include basic services and services designed to adjust or adapt clients to their current level of functioning. Adaptive services are primarily the traditional psychotherapies: milieu, individual, group, etc.

### **Promotive Service Package Options**

Promotive service packages include services specifically designed to improve the client's level of functioning. Promotive service packages can include basic and adaptive services, but focus on areas such as activities of daily living training and vocational training. Promotive services, are, in the main community based.

### **Current Service Package Options**

Current service packages describe the current status of services in the Alabama mental health system for persons at each functional level. A mix of orientations is reflected in these service packages. This mix is discussed in detail in the " Baseline" Application section below.

### **TRANSITION PROBABILITIES**

A major component of the HSRI resource allocation model is its service effectiveness database. This database consists of probabilities (known as transition probabilities) showing the chances that mentally disabled persons in a specific functional level receiving a particular combination of services will improve in functional level, regress, or remain the same. Transition probabilities were estimated by translating results of individual program evaluation studies into a common language and combining them so that their implications for policy questions could be quantitatively summarized. This

methodology was suggested by the literature on data synthesis. A detailed technical description of the methodology can be found in the paper contained in Appendix B, Description and Field Test of A Mental Health System Resource Allocation Model.

By using these data synthesis techniques it was possible to derive transition probabilities from the findings of almost one hundred separate evaluation studies, both published and unpublished, of services for severely mentally ill persons, ranging from hospital inpatient services to crisis hostels and half-way houses. The studies chosen addressed those individuals who were judged to have major mental illness and/or marked functional impairment as a result of mental illness. This group includes, but is not limited to, the chronically mentally ill and contains persons with more intermittent mental illness. Table 13 shows the transition probabilities used in the model analyses presented in this report.

#### **Disappearance Rate**

One of the transition probabilities that must be estimated for the resource allocation modeling is the rate at which clients disappear from or drop out of the mental health system. Such persons refuse or discontinue care against the advice of caregivers, and usually little is known of their status unless and until they return for services. Analysis of previous modeling projects and recent

TABLE 13  
 TRANSITION PROBABILITY COMPUTATION TABLE  
 FOR ALABAMA (USING MEAN DISAPPEARANCE RATE)

INITIAL FL	DESTINATION FL AFTER 1 MONTH							DISAP	DEATH	FL	
	A(1)	B(2)	C(3)	D(4)	E(5)	F(6)	G(7)			SUM	SUM
A(1) B	0.8492	0.0098	0.0276	0.0009	0.0761	0.0207	0	0.0123	0.003	1	0.984
A(1) A	0.8492	0	0.0474	0.0079	0.0790	0.0009	0	0.0123	0.003	1	0.984
A(1) P	0.7108	0	0.0919	0.1769	0.0019	0.0029	0	0.0123	0.003	1	0.984
B(2) B	0	0.2217	0.0582	0.6633	0.0081	0.0194	0	0.026	0.003	1	0.971
B(2) A	0.0081	0.1543	0.2125	0.2330	0.2698	0.0930	0	0.026	0.003	1	0.971
B(2) P	0.0969	0.1715	0.0102	0.0071	0.2940	0.3481	0.042	0.026	0.003	1	0.971
C(3) B	0	0.0452	0.9059	0.0127	0.0009	0	0	0.032	0.003	1	0.965
C(3) A	0	0.0324	0.8420	0.0088	0.0413	0.0403	0	0.032	0.003	1	0.965
C(4) P	0	0.0186	0.7800	0.0049	0.0816	0.0796	0	0.032	0.003	1	0.965
D(4) B	0	0.0406	0.0009	0.9058	0.0048	0.0077	0	0.037	0.003	1	0.96
D(4) A	0	0.0522	0	0.9077	0	0	0	0.037	0.003	1	0.96
D(4) P	0	0	0	0.9106	0.0493	0	0	0.037	0.003	1	0.96
E(5) B	0	0.0123	0	0	0.9288	0.003	0	0.052	0.003	1	0.945
E(5) A	0.0038	0.0066	0.0019	0.0038	0.9193	0.0095	0	0.052	0.003	1	0.945
E(5) P	0	0.0056	0	0	0.9345	0.0047	0	0.052	0.003	1	0.945
F(6) B	0	0.0325	0	0	0	0.8854	0	0.079	0.003	1	0.918
F(6) A	0.0046	0.0176	0	0.0018	0	0.8938	0	0.079	0.003	1	0.918
F(6) P	0	0	0	0.0046	0.0055	0.9022	0.005	0.079	0.003	1	0.918

data generated by HSRI's national study of community support program clients suggested that the disappearance rate obtained from the data synthesis was too low due to the fact that persons likely to disappear from service are also unlikely to agree to participate in evaluation research.

Consequently, an estimate of client disappearance rates under the current Alabama system was obtained from a convenience sample of 6 community mental health centers.

The steps in this process were as follows:

1. First, the centers were asked to estimate the total number of clients who disappeared from their service systems in one year. A disappearance was defined as a client discontinuing or rejecting care against the advice or without the approval of treatment staff. This number was assumed to be an approximation of the total number of client episodes annually ending in disappearance.
2. Next, the centers were asked to estimate the total number of clients served in a year. This number was assumed to be an approximation of the total number of client episodes in a year, including those carried over from the previous year. This assumption was supported by the fact that for five of the six centers, the estimates reported exceeded the numbers of admissions reported by the centers in 1985. For the sixth center, the number of client episodes estimated was equal to the number of admissions reported, suggesting an undercounting of episodes for this center.
3. Global disappearance rates were then computed for each center by dividing the estimated number of episodes ending in disappearance by the estimated total number of episodes.
4. Next, of the total number of clients who disappeared, centers were asked to estimate what percentage disappeared from each functional level.
5. These percentages were then multiplied by a center's global disappearance rate to estimate that center's disappearance rates for each functional level.

6. Finally, for each functional level, the mean of the six centers' disappearance rates was taken as the estimate of the disappearance rate for that functional level to be used in the model.

Table 14 shows the disappearance data collected from each center and the disappearance rate computed. The transition probabilities used in the model analyses presented in this report were adjusted to reflect the disappearance rates shown in Table 14. This was done by subtracting the Alabama disappearance rates from the sum of all probabilities for each functional level (i.e. 1.00), and distributing the remainder (1 - disappearance rate) so as to maintain the same proportionality among transition probabilities observed in the transition probabilities gleaned from program evaluation research.

#### DOLLAR RESOURCES

An estimate of dollar resources currently available for services to persons in the planning population was developed in consultation with Central Office staff from the DMH budget for fiscal year 1985-86 and the 1985 Systems Plan. Monies for substance abuse programs and child and adolescent services were excluded from this estimate. Given these exclusions the current DMH mental health budget was estimated to be approximately 79.7 million dollars for adult hospital services and 21.5 million dollars for adult community mental health services. An additional 10 million dollars were estimated to be available to CMHC's from a

TABLE 14  
DISAPPEARANCE RATES BASED ON 6 AREAS

	Chilton/ Shelby	Wiregrass	N.W. AL. MHC	Mobile	Jeff./Blount/ St. Clair	Riverbend	Mean
F1 %	0.150	0.063	0.010	0.014	0.000	0.020	
F1 rate	0.037	0.028	0.001	0.004	0.000	0.004	0.012
F2 %	0.300	0.063	0.010	0.069	0.196	0.030	
F2 rate	0.075	0.028	0.001	0.020	0.027	0.006	0.026
F3 %	0.250	0.063	0.030	0.229	0.137	0.050	
F3 rate	0.062	0.028	0.003	0.067	0.019	0.010	0.032
F4 %	0.100	0.063	0.050	0.383	0.137	0.150	
F4 rate	0.025	0.028	0.005	0.113	0.019	0.029	0.037
F5 %	0.100	0.250	0.100	0.239	0.333	0.250	
F5 rate	0.025	0.114	0.010	0.070	0.045	0.048	0.052
F6 %	0.100	0.500	0.800	0.066	0.196	0.500	
F6 rate	0.025	0.227	0.083	0.019	0.027	0.095	0.079
Total %	1.000	1.000	1.000	1.000	0.999	1.000	
Total # Served	1141	3667	1934	4228	377	2625	
Total # Dis.	285	1666	200	1243	51	500	

Note: For Wiregrass, .0125 was added to the given rates of .05 for Functional Levels 1 through 4. (Presumed reporting error)



variety of sources. These estimates yielded a total budget of approximately 111.2 million dollars.

To estimate the largest possible budget available to the DMH, the fiscal year 1986-87 budget request and plans adopted by the Capital Construction Committee were used. After exclusions for substance abuse and child and adolescent services, "high-side" budget estimates of 83.3 million dollars in hospital funds and 24.6 million in community funds (105.8 million total) were generated. When another 10 million dollars was assumed from CMHC revenues, the estimated total was 115.8.

To generate a "low-side" budget estimate, the FY 1986-87 mental health budget submitted by the Governor was used. It was assumed that the cuts in this budget would be distributed evenly to all services. Once again, funds for substance abuse and child and adolescent services were excluded. This process yielded low-side estimates of 75.7 million dollars for hospital services and 19.7 million dollars for community mental health services. Again, when another \$10 million dollars was assumed for CMHC's, the low-side total mental health system budget was estimated to be 105.4 million dollars.

These estimates served two purposes. First, they were used to operationally define affordable strategies. That is, resource allocation strategies were sought that would not require resources greatly in excess of those currently

available. Second, the current resource estimate was compared with model projections of resources spent under strategies thought to approximate the current service system as one means of finding a "baseline" strategy for the Alabama mental health system. These baseline model applications are described in detail below.

## OBJECTIVES

Rational resource allocation planning requires explicit statements of system objectives. For this project several objectives were entertained. These are as follows:

### Major Objectives

1. **Maximize net forward steps.** This objective was operationally defined as the sum of all those forward steps predicted for clients under a given strategy, minus the sum of all those negative ones predicted under that strategy. Note that for any service package option, the transition probabilities HSRI has derived from research studies predict that some clients will advance in level of functioning one or more steps, some will move backward one or more steps, and some will remain at the same level.

Note also, that this strategy counts all forward steps equally. Thus a movement from Functional Level 1 to Functional Level 2 counts the same as one from Functional Level 6 to Functional Level 7.

2. **Keep costs in an affordable range.** A number of strategies were explored for this project. However, in keeping with the affordability objective, most of the strategies explored in depth were ones approximating the range of estimated current Alabama expenditures and possible budgets for 1986-87.
3. **Maximize effectiveness-cost.** Effectiveness-cost was defined as the ratio of net forward steps to predicted system costs. The higher a system's effectiveness-cost ratio, the more efficient the system.

## Second Order Objectives

4. **Maximize the number of client episodes ending in persons reaching system independence.** Below we describe how each of the strategies selected for presentation performed on this objective. However, strategies were selected for presentation primarily based on the first three objectives. This is because we judged that the objective of maximizing the number of episodes ending in persons reaching system independence does not give enough weight to client progress, and maintenance of progress, within the system. As noted, maximizing net forward steps counts all forward steps equally and does not have the same bias.
5. **Minimize the number of hospital beds used.** Once again, we did not select strategies for presentation based on how they performed with respect to this objective, however, we do report on this objective. This is because we judged this objective to have the opposite problem to the objective directly above. That is, this objective weights too heavily client movements from the lower functional levels.

## APPLYING THE HSRI RESOURCE ALLOCATION MODEL

The HSRI Resource Allocation Model can be thought of as consisting of several components: a conceptual framework, input data, a mathematical formulation, and computer implementations. The conceptual framework and mathematical formulations are described in detail in Appendix B. The input data have been described above. In this section we present a brief description of the two microcomputer implementations that embody the model.

The first is the HSRI linear programming model (HSRILP) model. Given estimates of a system's resources and its objectives, this model finds strategies for assigning

clients to service packages that go as far as possible in reaching (i.e. optimizing) these objectives.

The second microcomputer program is the HSRI simulation model (HSRISIM). HSRISIM reflects the same conceptual structure as HSRILP, and it uses the same data. However, HSRISIM requires that the user instruct it as to what clients get what service package options. Usually HSRI uses HSRILP to find candidate resource allocation strategies and then employs HSRISIM to gain a refined understanding of the strategies and how slight modifications in the strategies affect their performance.

HSRILP and HSRISIM both operate on IBM compatible microcomputers with 640K and both require LOTUS 123. HSRILP also requires a math chip and additional programs.

## RESULTS OF MODEL APPLICATIONS

Table 15 summarizes the results of model applications selected for presentation.

### The "Baseline" Application

Strategy 1 is a "baseline" application. It suggests the service packages the current Alabama mental health system is providing. This baseline application was developed by a process of successive approximation guided by available data. Two criteria were used in searching for a baseline strategy. First, a strategy was sought that used

TABLE 15

Alabama Resource Allocation Modeling Project  
Strategy Summary

Strat. No.	Service Packages: FL:A(1),B(2),C(3) D(4),E(5),F(6)	Year	Annual DMH&MR Cost (000'S)	Z Annual Change	Net Forward Steps	Intens. Tx Beds	ALA-H Beds	ALA-C Beds	Episodes Ending with Clients Reaching FL 7	Effectiveness/Cost (NFS/COST in \$ millions)
1	C,C,C,B,B,B	1	\$156,916		13600	712	1939	0	0	86.7
	(\$'s for all FL's)	2	\$133,316	-15%	8631	630	1631	0	0	64.7
		3	\$125,370	-6%	8263	618	1507	0	0	65.9
2	C,P,P,A,B,B	1	\$130,041		20663	819	0	688	3739	158.9
	(\$'s for all FL's)	2	\$96,114	-26%	12417	813	0	364	8984	129.2
		3	\$87,499	-9%	11798	783	0	327	13584	134.8
3	C,P,P,B,B,P	1	\$162,138		23857	681	951	519	5977	147.1
	(\$'s for all FL's)	2	\$122,701	-24%	13772	610	629	242	15794	112.2
		3	\$112,434	-8%	13004	585	522	223	24725	115.7
4	C,C,C,B,B,B	1	\$146,875							
	(\$'s for FL A to FL D only)	2	\$123,702	-5%						
		3	\$116,066	-6%						
5	C,P,P,A,B,B	1	\$118,898							
	(\$'s for FL A to FL D only)	2	\$85,316	-28%						
		3	\$77,183	-10%						
6	C,P,P,B,B,P	1	\$113,751							
	(\$'s for FL A to FL D only)	2	\$76,423	-33%						
		3	\$68,584	-10%						

approximately the same number of inpatient hospital beds as used by the current system (about 2200 beds, not including forensic beds). Second, a strategy was sought that consumed approximately the same dollar resources as the current Alabama system (111.2 million dollars).

In searching for a baseline strategy it was necessary to use different combinations of the service packages developed by the Planning Task Force. It should be remembered that these service package options were designed not to represent the current system, but rather to suggest different options for the future. Nevertheless, it was felt by Task Force members that some combination of Basic and Adaptive service package options would best approximate the service packages currently offered to most clients by the Alabama system. Consequently, various combinations of these service package options were explored.

The strategy coming closest to describing the current system was one that combined Adaptive inpatient services with Basic community services for Functional Levels A through C. Adaptive transition probabilities were used for this reconfigured set of services, designated "Current Service Package." For Functional Levels D through F, Basic Service Packages best approximated the baseline criteria. The Basic transition probabilities were maintained for these Basic Services Packages.

This baseline strategy used 259,828 intensive treatment hospital days and 707,653 assisted living alternative-hospital days at a cost of approximately 27 million dollars for the former and 58 million dollars for the latter. These projections result in a predicted hospital utilization of 2651 beds at a cost of 85 million dollars.

The baseline strategy uses a larger number of beds than currently are used for the planning population in Alabama's state hospitals alone. However, the planning population currently is known to use an undetermined number of private general and specialty hospital beds, which could account for some of the difference observed for number of beds.

The residential and non-residential service costs under the baseline strategy are 48.5 and 23.1 million dollars, respectively, or a total of 71.6 million dollars. This is considerably more than the estimated current budget amount of 31.5 million dollars. However the Basic Service Package generates almost a million transitional group home days in excess of those estimated to be available (see Table 16, below) at a cost of almost 41 million dollars. If this amount is subtracted from the projected total, the baseline cost for community services is reduced to approximately 30.6 million dollars, and the total system cost to \$115 million dollars, which closely approximates the estimated expenditures of \$111.2 million.

Table 16 further illustrates the relationships between the baseline strategy and available services by comparing results of the strategy to the 1984 Alabama Systems Plan. The total number of inpatient hospital days is very similar. There is a wide disparity in community residential service days. Non-residential community services from both frameworks approximate each other, although the baseline strategy tends to predict higher utilization.

These findings suggest that the current system is offering to clients at functional levels A-C only the institutional component of Adaptive service packages. The findings for community services, particularly those for residential services, suggest that, in the community, many clients are receiving service packages that are not well described by either the Basic or the Adaptive service packages developed.

One explanation for this may be that the planning task force did not develop service packages for Alabama's rural areas. Although, the planning task force recognized the necessity for conceptualizing rural services in a different manner from urban ones, it was unable to come up with rural service packages in this planning cycle.

Figure 1 is a cumulative graph showing hospital, community residential, community non-residential, and total costs for Strategy 1. Figure 2 is a cumulative graph which predicts number of clients at each functional level for both



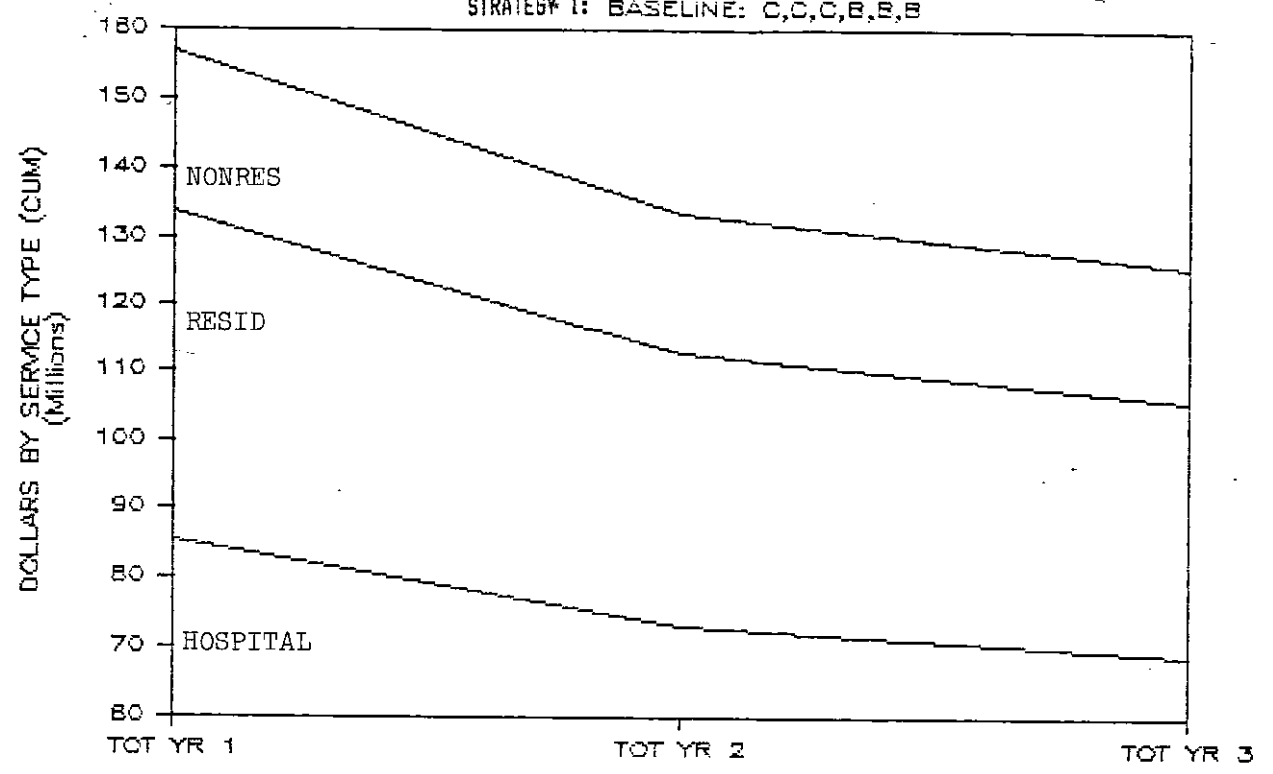
TABLE 16

ALSIM MODEL RESOURCE OUTPUT: SYSTEMS PLAN FRAMEWRK

FUNCTIONAL LEVEL												
A B C D E F												
STRATEGY: C C C B B B												
DISAPPEARANCE RATE: MEAN												
BUDGET: \$156,915,616												
-----												
HSRI MODEL												
SYSTEMS PLAN												
SERVICES	INPAT ACUTE	INPAT CHRONIC	SPEC CARE	TR GRP HOME	FOS HOME	BOARD HOME	NURS HOME	OUTPAT PSYCH	DAY TREAT	DAY ACT	CASE MGT	NON-SYS SERVICES
-----												
INTEN. TX	259,828											
ALA-HOSP		707,653										
NURS HM							230,592					
INT TGH												0
TR GRP HM			1,055,721									0
FOS HOM				389,099								
BOARD HM					1,842,405							
ALA-COM												0
INDEP LIV												4,210,019
OUT PSYCH								513				
CRIS/EMER								120,508				
DAY TREAT									12,074			
DAY ACT												0
MED MAIN								108,336				
MED DENT												44,181
SHELT WRK												0
WRK STA												0
JOB PLACE												0
EVAL												0
ADL												0
CASE MGT											244,632	
SOC CLUB										105,902		
FAM SUP												0
COURT LIA												16,916
LIA H/C											4494	
RES SERV												0
HSRI MOD												
PLAN TOT	259,828	707,653	0	1,055,721	389,099	1,842,405	230,592	229,357	12,074	105,902	249,126	
SYS PLAN												
AVAILABLE	379,163	575,204	0	105,154	104,145	0	439,825	175,414	184,786	48,633	11,605	
DIFFERENCE	(119,335)	132,449	0	950,567	284,954	1,842,405	(209,233)	53,943	(172,712)	57,269	237,521	

# ALABAMA COSTS BY SERVICE TYPE

STRATEGY I: BASELINE: C,C,C,B,B,B



PLANNING PERIOD  
FIGURE 1

# ALABAMA CLIENTS BY FUNCTIONAL LEVEL

STRATEGY 1: BASELINE: C,C,C,B,B,B

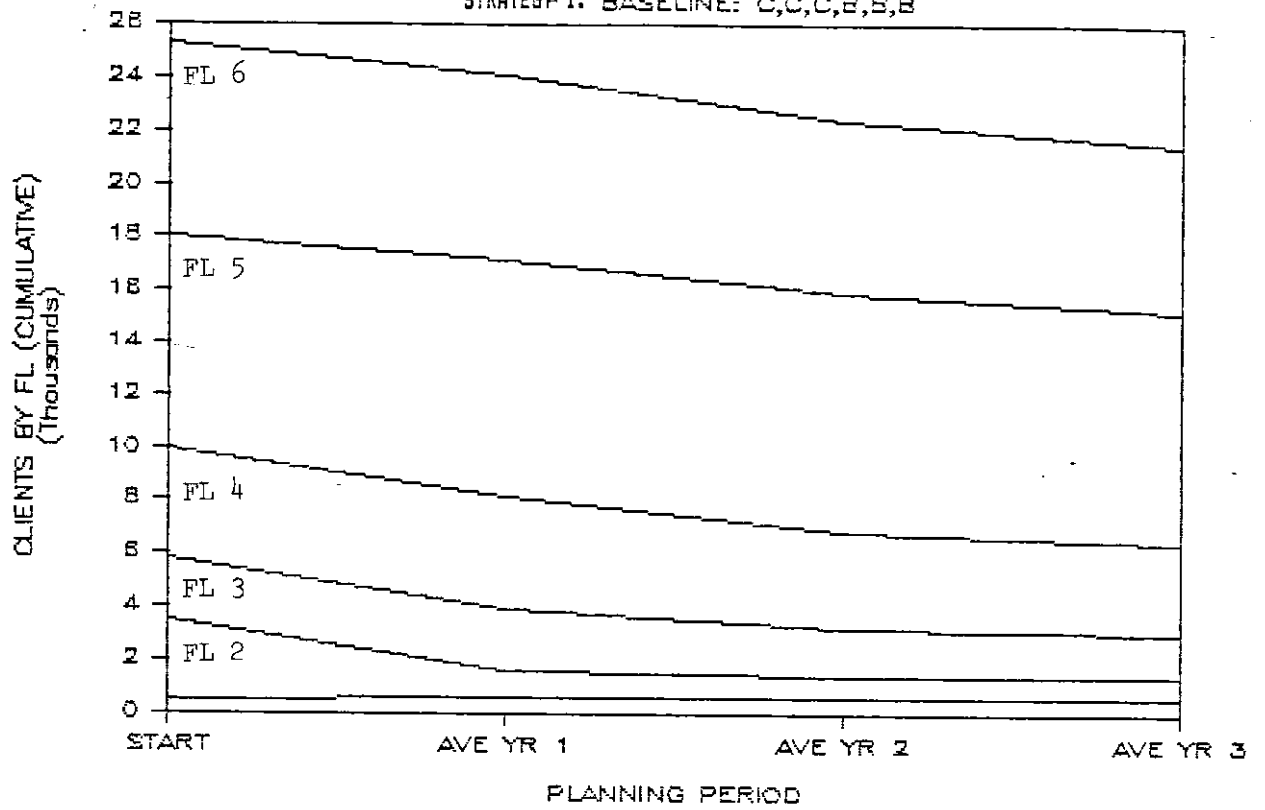


FIGURE 2

Strategy 1. The downward slope for both graphs show that the simulation tends to underestimate clients and costs over time.

This is particularly due to the dramatic drop in number of clients at Functional Level 2 from start-up to the average for Year One. There are several possible explanations: 1) the snapshot estimate may have been unrepresentative, 2) there may be a flaw in the transition probability estimates for this functional level, and 3) some clients in the sample may have been mistakenly coded as Functional Level 2.

Over time we may improve our ability to model the current system. However, the baseline strategy described above, which posit that the current Alabama mental health system is providing service package options to its clients that are between Basic and Adaptive in their levels of rehabilitation potential, except in the residential area, seems a not unreasonable depiction of the current system. Given this as a starting point, this report turns next to the question of how this strategy could be improved.

### **New Directions for the Alabama Mental Health System**

Following the selection of a validation strategy, HSRI implemented multiple LP and simulator model applications to find affordable combinations of service packages that would be more productive than the current one. Strategies 2 and 3

are those strategies found to be most promising given Alabama's current budget constraints.

Both strategies would cost more than Alabama is currently spending. However, both would also be more cost effective than the baseline strategy. Approaches to the shortfall shown for these strategies are discussed in the sections below on targeting and demonstration projects.

Strategy 2 provides the current service package option to clients at Functional Level A. In fact, the Planning Task Force decided that, at the present time, no alternatives to the the current service package option should be considered for this Functional Level, due to the difficulties of providing community based services to clients at this Level. Clients at Functional Levels B and C are assigned to Promotive service package options, clients at Functional Level D receive Adaptive service packages, and clients at Functional Levels E and F receive Basic service packages.

Strategy 2 is the least costly alternative strategy discovered using the data estimated for this project. It begins with an annual budget of 130 million dollars. The strategy uses 819 intensive treatment beds by diverting hospital episodes to Assisted Living Alternatives in the community where they account for 688 beds. Hospital and residential costs are each about 37 million dollars, while non-residential costs are almost 55 million dollars. By

Year 3, this Strategy 2 predicts total costs will be down to 87 million dollars, however, this prediction is judged to be overly optimistic and should be viewed in the context of the baseline simulation which shows the model to be under predicting clients and costs over time.

The cost effectiveness for Strategy 2 (net forward steps per cost) is dramatically higher than for the Baseline Strategy. Furthermore, Strategy 2 projects that many clients (3739 in the first year) will reach Functional Level 7 and thus leave the system. The baseline strategy showed no clients attaining system independence.

Strategy 3 differs from 2 in offering the Basic service package option to clients at Functional Level C and the Promotive service package option to clients at Functional Level F, which maximizes net forward movement, is less cost effective than the minimized resource strategies, but delivers more clients to Functional Level 7 (5977 in the first year and 24,725 by the third year).

This strategy uses, in the first year, a total of 1632 inpatient beds, of which 681 are intensive treatment and 951 are Assisted Living Alternative beds in the hospital. These strategies call for an additional 519 Assisted Living Alternative beds in the community. Thus the total number of beds is similar to the current beds available but the location differs. However, this difference in setting has implications for longterm outcome and the two types of

Assisted Living Alternatives (hospital and community) should not be viewed as completely interchangeable. Clients treated in the community will be more likely to progress in level of functioning than those treated on state hospital grounds.

## **Responses to Budget Constraints**

### **Targeting**

One response to funding constraints is targeting funds to those clients deemed to be the neediest. Usually these are clients at lower levels of functioning.

Strategies 4,5, and 6 represent simulations targeting services for the lower functional levels A through D. These analyses were conducted to explore alternative strategies in light of budget constraints. Thus, for instance, if DMH funded services for functional levels A through D, using a baseline strategy (Strategy 4), first year costs would be \$146.9 million, a reduction of \$10 million dollars from a baseline strategy (Strategy 1) in which the DMH bears costs for all six functional levels.

Strategy 5 is a version of Strategy 3 that funds services for Functional Levels A through D only. The cost differential between Strategy 2 and Strategy 5 is about \$12 million dollars for the first year.

Strategy 6 is a version of Strategy 3 that limits DMH costs to the lower four functional levels. The cost

difference between strategy 3 and Strategy 6 in the first year is dramatic; the limited group strategy costs nearly \$48 million dollars less than full coverage of all functional levels. These findings suggest that targeting DMH dollars to specific groups is a plausible option.

It should be noted, however, that targeting will only work as predicted if services, paid for by other sources, are provided to those clients who are not prioritized for Department of Mental Health Funds. Otherwise, targeting services to lower functioning clients and not providing services to higher functioning ones can result in phenomena like rapid recidivism and "homelessness."

#### **Demonstration**

A second approach to budgetary limitations is the use of demonstration projects. This approach directs funds to certain substate areas rather than specific client subgroups.

Demonstration approaches are particularly appropriate because the predictions made as to the efficacy of a strategy assume that the service packages called for by the strategy will be provided *in toto*. This means that providing only one of several service packages called for by a strategy, or only one of the services in a service package can not be expected to have the result predicted for the entire strategy.



This point is emphasized because states often engage in the piecemeal implementation of service systems. This is often an effort to equitably distribute resources that are too minimal for everyone to receive all of the components of a comprehensive system. Unfortunately, this approach, although equitable, may be short sighted, since it puts in place services that will not live up to the claims made for them. A better approach, given limited resources, would be to provide comprehensive service packages to demonstration sites and then strive to expand the concept based on the demonstrated effectiveness of the systems.

#### **Details of Suggested Strategies**

A number of Figures follows below. These graphically illustrate the implications of the Strategies shown in Table 15. Separate sets of figures are presented to illustrate different aspects of a strategy's impact on clients, costs, and services. Where appropriate, data for the current system or start of the planning time frame are presented. These data are followed by data for alternative strategy planning years. These years are labeled "ALT YEARS" in the graphs. Note that the Y-axis scales for these graphs change from graph to graph.

- o Figures 3 - 7 show how costs for hospital, residential, and non-residential services change for each planning year under strategies 2 through 6. These figures present cumulative graphs and also show total system costs.
- o Figures 8 - 9 show how the numbers of clients at each functional level change annually over the planning period under Strategies 2 and 3.

# ALABAMA COSTS BY SERVICE TYPE

-STRATEGY 2: C,P,P,A,B,B

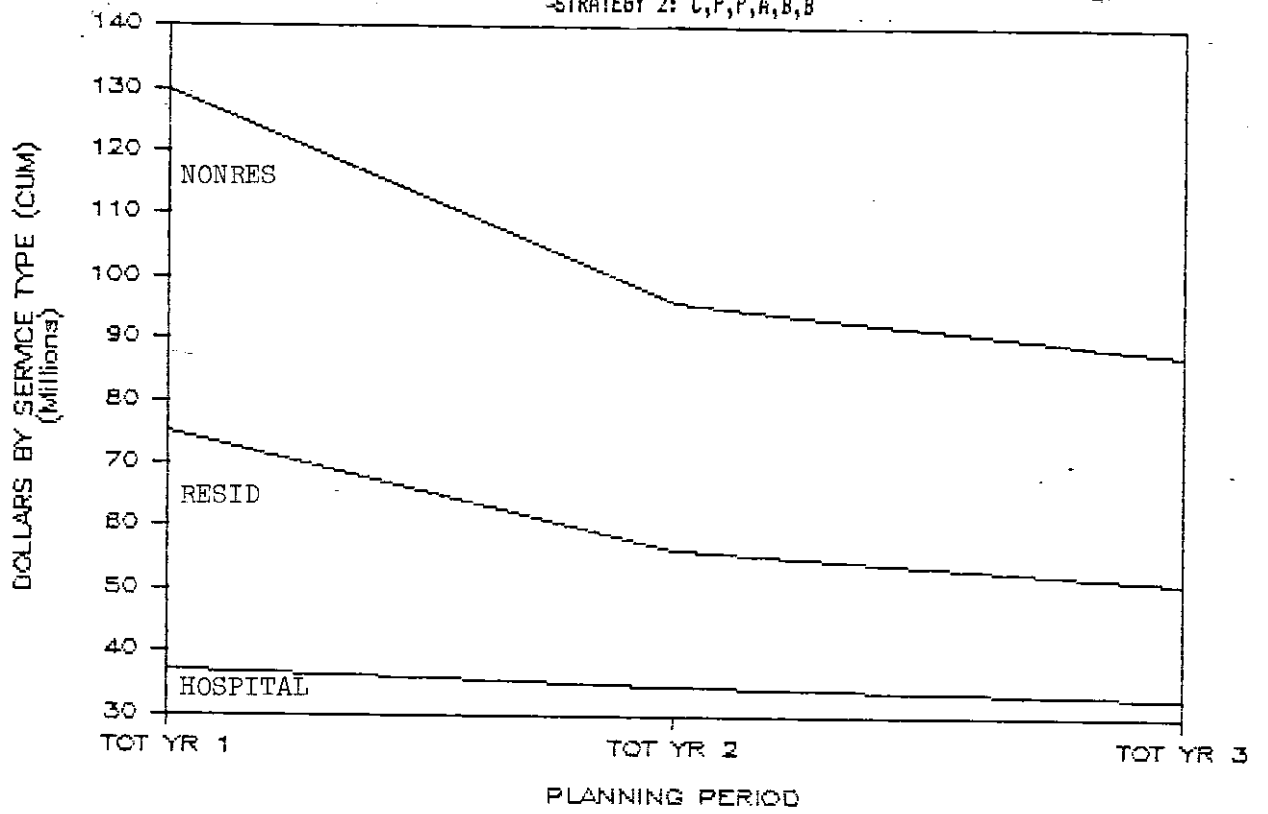


FIGURE 3

# ALABAMA COSTS BY SERVICE TYPE

STRATEGY 3: C,P,P,B,B,P

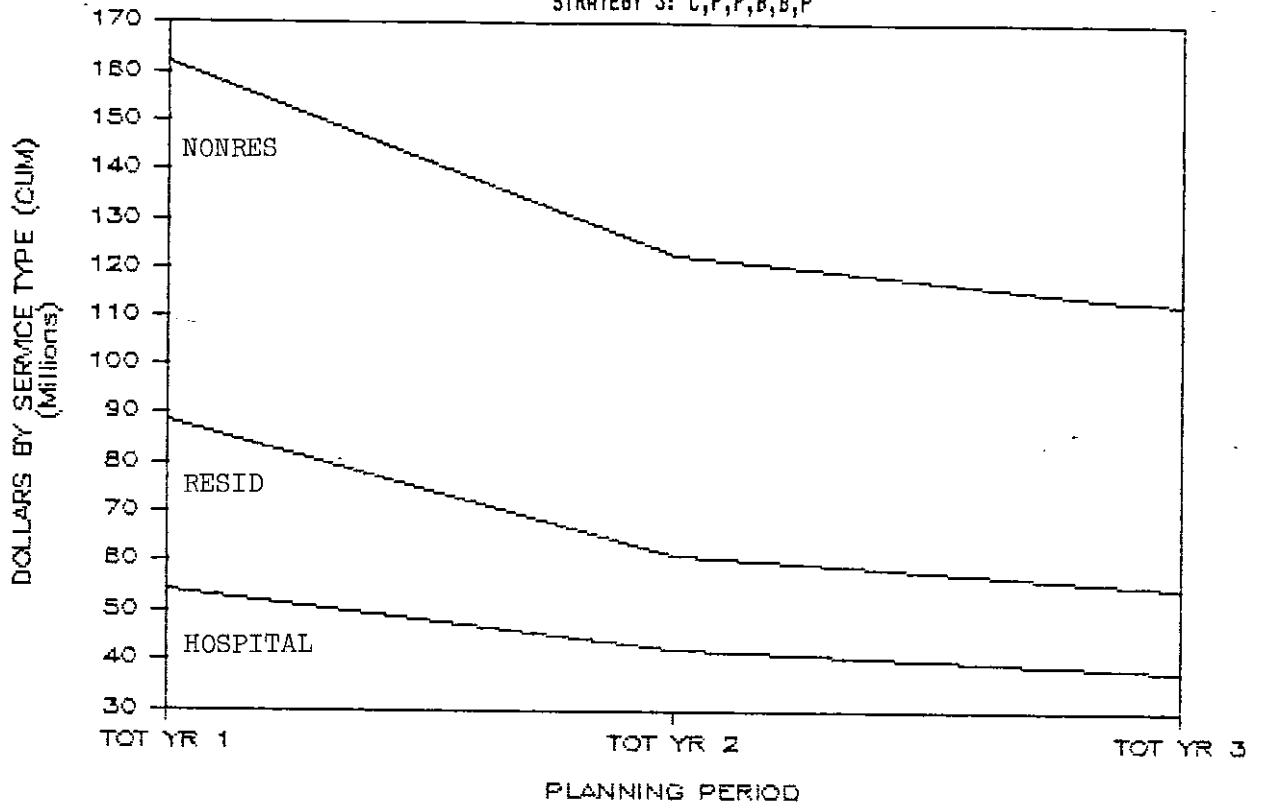


FIGURE 4

# ALABAMA COSTS BY SERVICE TYPE

STRATEGY 4: C,C,C,B,B,B

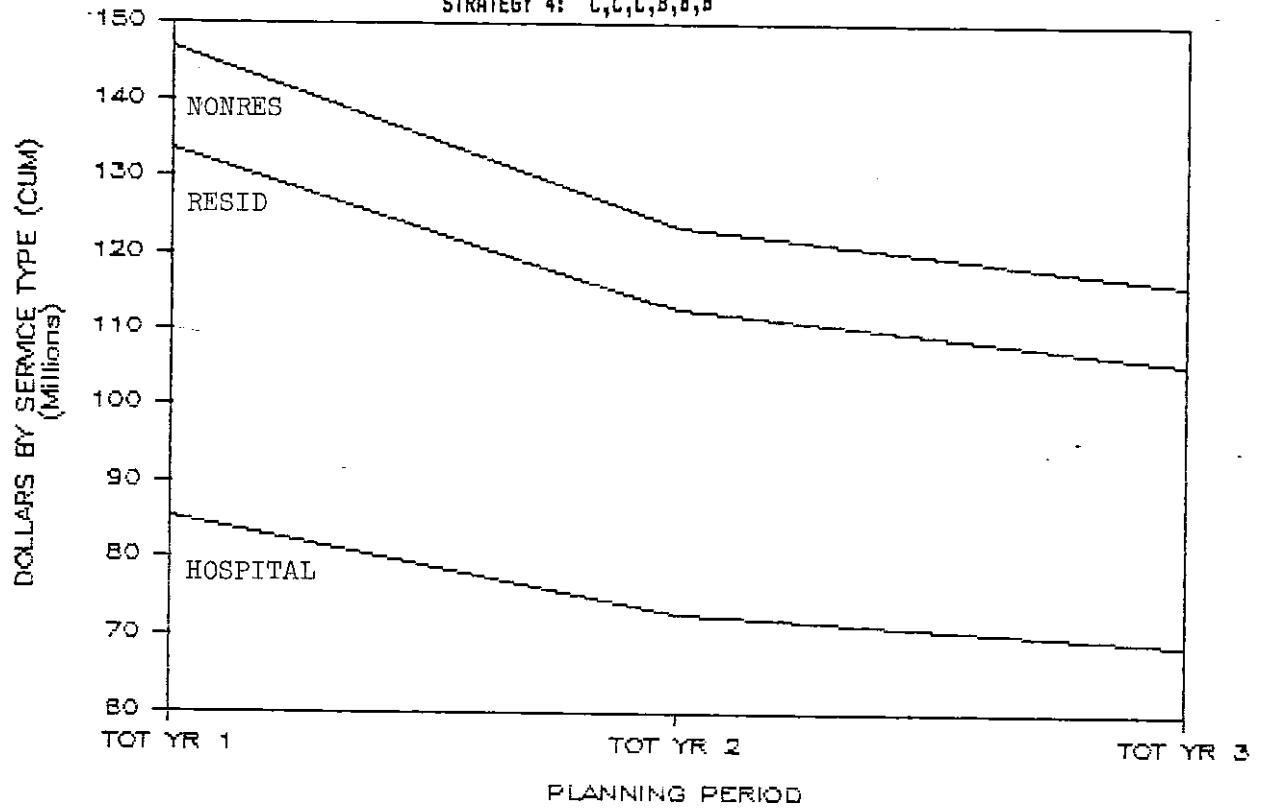
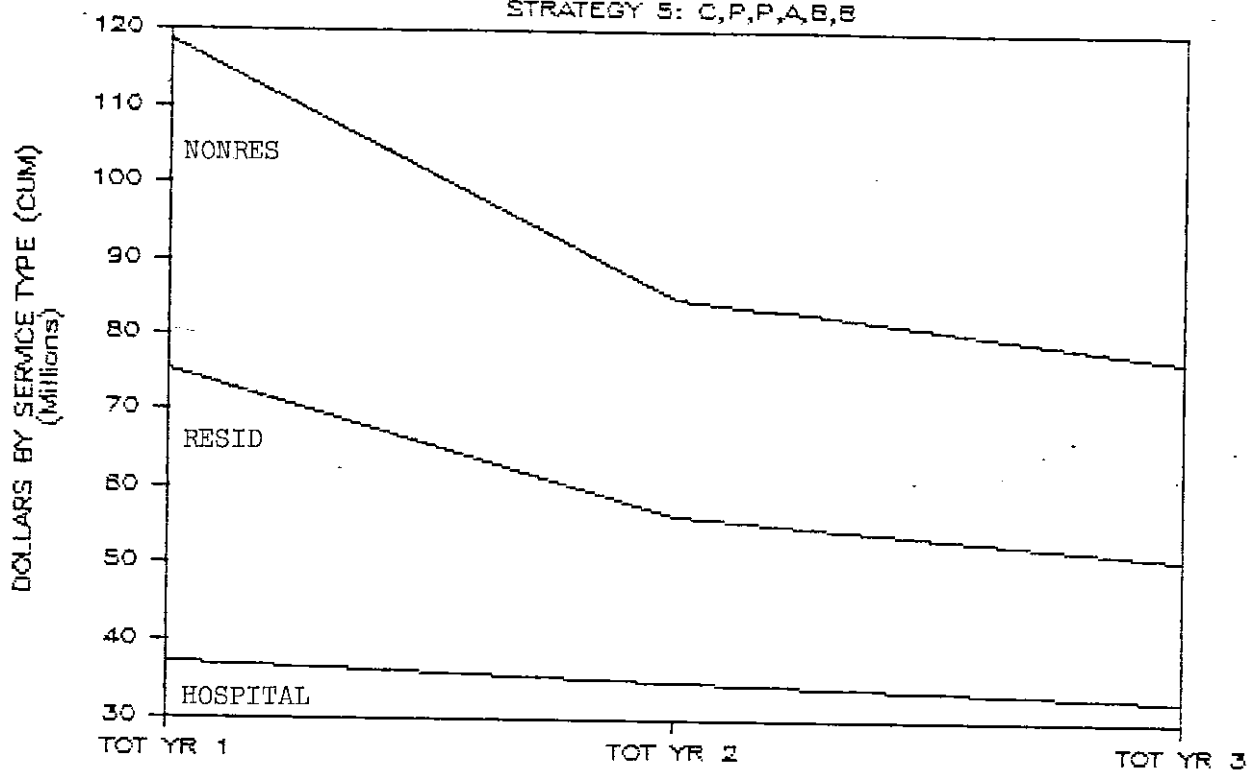


FIGURE 5

# ALABAMA COSTS BY SERVICE TYPE

STRATEGY 5: C,P,P,A,B,B



PLANNING PERIOD

FIGURE 6

# ALABAMA COSTS BY SERVICE TYPE

STRATEGY B: C,P,P,B,S,P

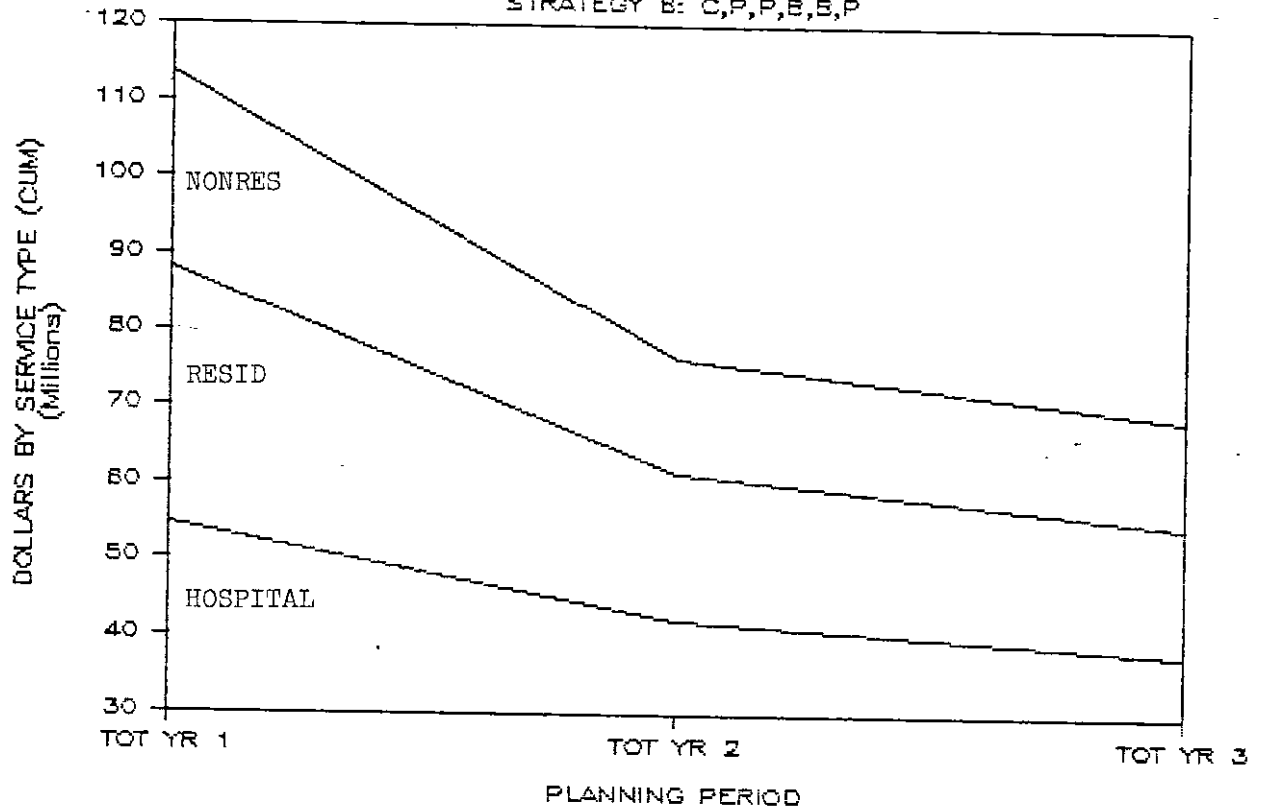
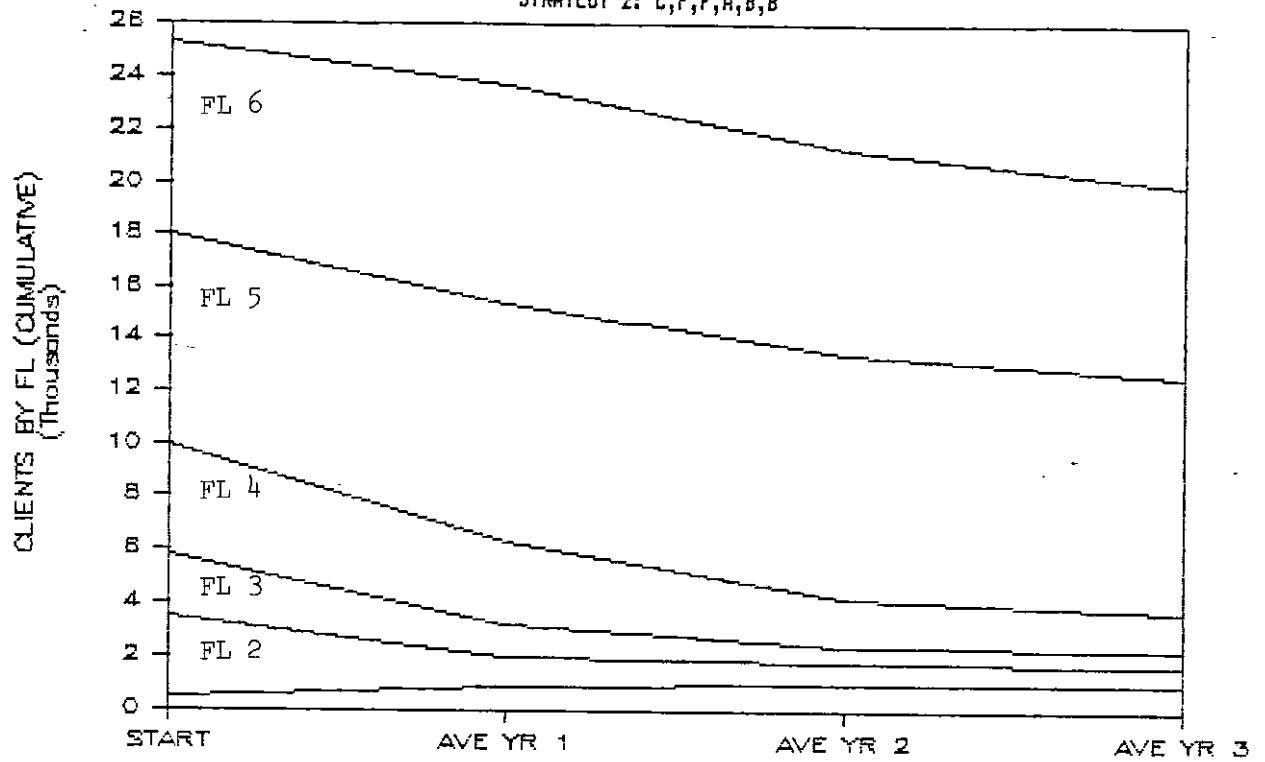


FIGURE 7

# ALABAMA CLIENTS BY FUNCTIONAL LEVEL

STRATEGY 2: C,P,P,A,B,B



PLANNING PERIOD

FIGURE 8

# ALABAMA CLIENTS BY FUNCTIONAL LEVEL

STRATEGY 3: C,P,P,B,B,P

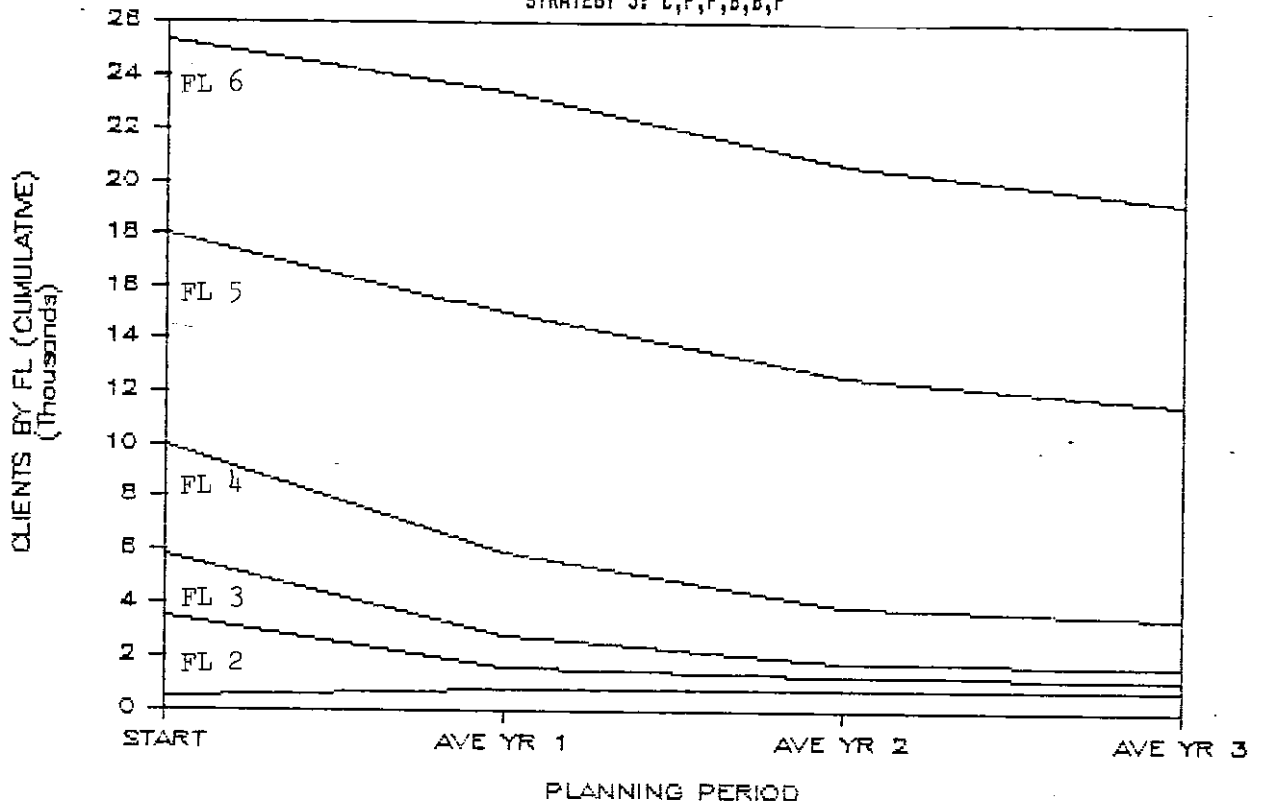


FIGURE 9



- o Figures 10 - 11 depict trends in the utilization of residential services.
- o Figures 12 - 13 present the trends in the utilization of treatment services.
- o Figures 14 - 15 present the trends in the utilization of rehabilitation services.
- o Figures 16 - 17 show trends in the utilization of support services.

Several points in regard to the above strategies bear making.

- o Although Strategies 2 and 3 suggest that after a period of operation costs might approximate the current system budget, or even reduce it, this is based on the assumption that institutional costs would be reduced drastically in a relatively short period of time, and that these institutional dollars would follow clients to the community. These assumptions are almost certainly too optimistic about the time frame for the radical changes shown in Table 15. The results shown could only happen over a longer period of time, and would depend very much on the rate at which new community services could be implemented.
- o In the baseline strategy, as well as in the alternative strategies presented in the next section, intensive treatment, as defined in Table 10, includes state hospital, private hospital and crisis stabilization beds. Should crisis stabilization beds be the treatment of choice, additional community services would be necessary. Should private hospital beds be used, costs shown would probably be higher, given that such hospitals charge higher per diem rates than those charged by state hospitals or projected for crisis stabilization units.
- o As noted above, the costs shown are only DMH costs. Total social costs for these strategies would be much higher. To compute total social costs it would be necessary to determine unit costs for services such as boarding homes and medical/dental care. It would also be desirable to estimate unit costs for infrastructure services such as police and fire protection. These tasks were beyond the scope of the current project.

# ALABAMA RESIDENTIAL SERVS. UTILIZATION

STRATEGY 2: C,P,P,A,B,B

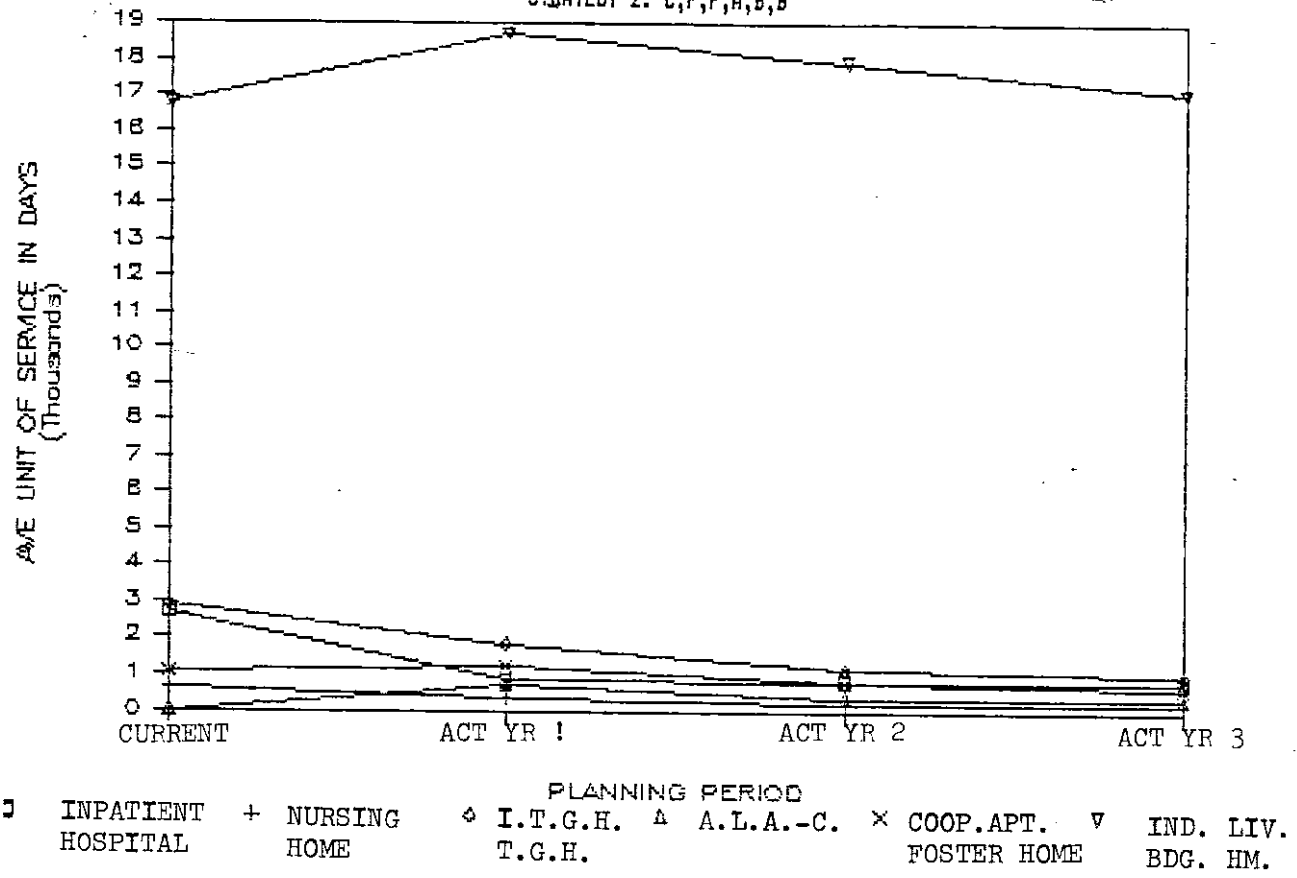


FIGURE 10

# ALABAMA RESIDENTIAL SERVS. UTILIZATION

STRATEGY 3: C,P,P,B,B,P

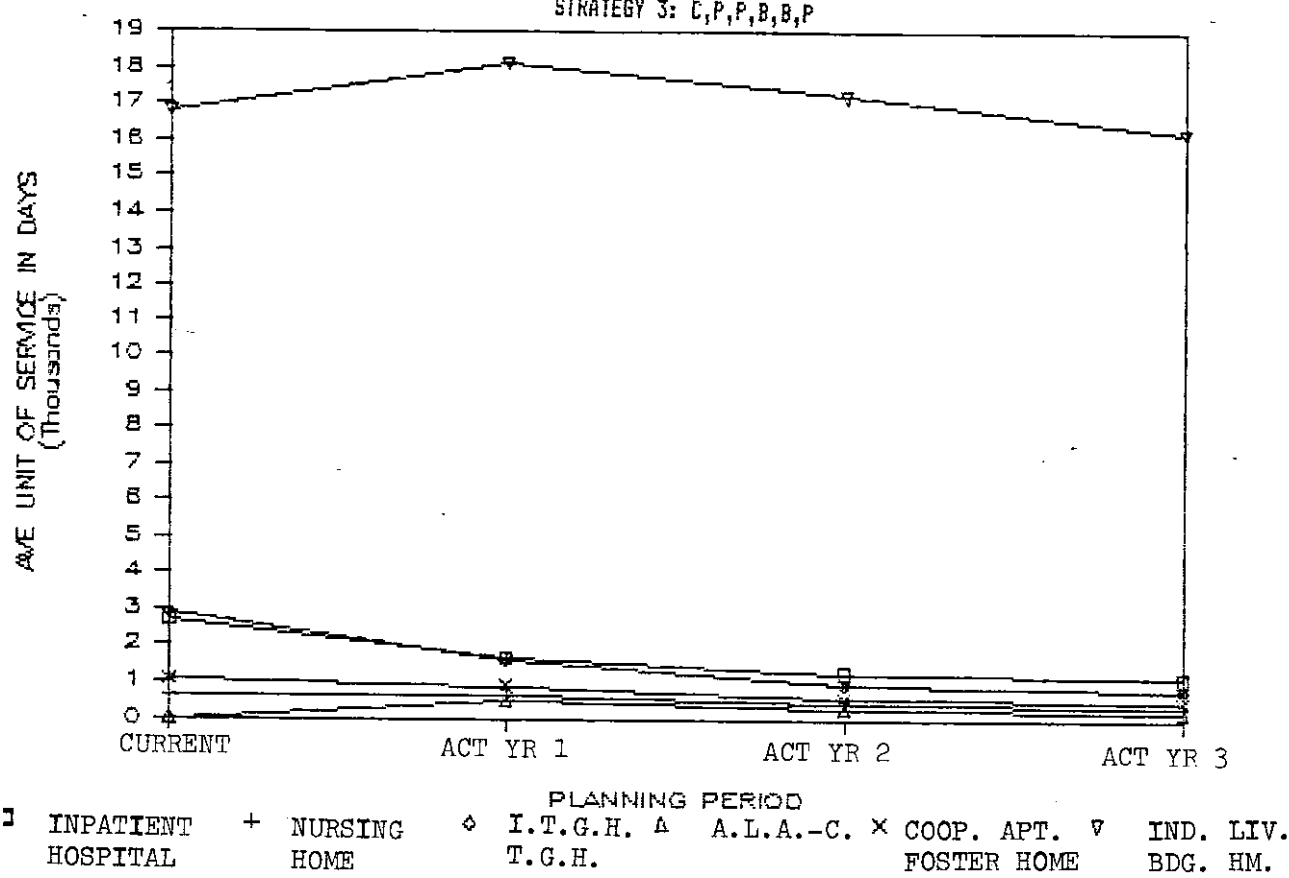


FIGURE 11

# ALABAMA TREATMENT SERVS. UTILIZATION

STRATEGY 2: C,P,P,A,B,B

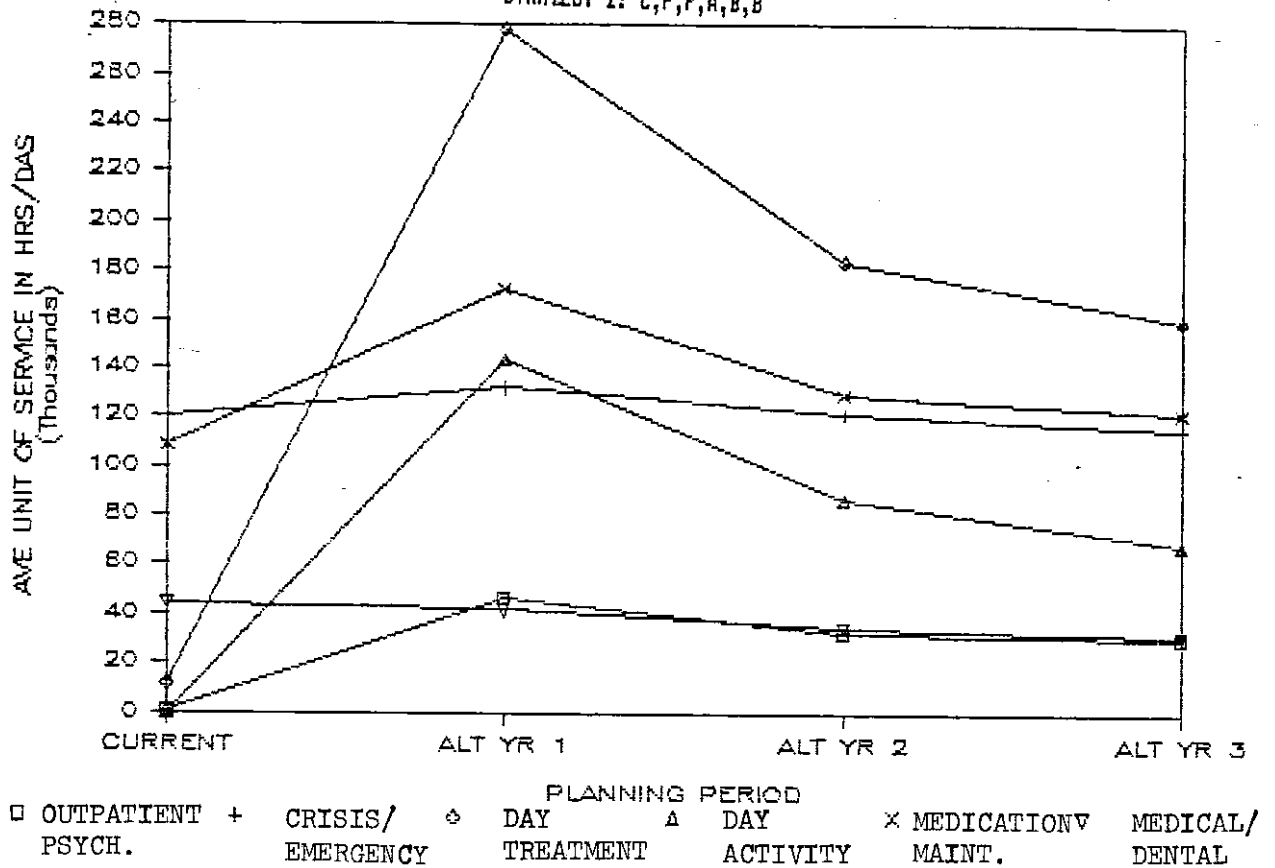


FIGURE 12

# ALABAMA TREATMENT SERVS. UTILIZATION

STRATEGY 3: C,P,P,B,B,P

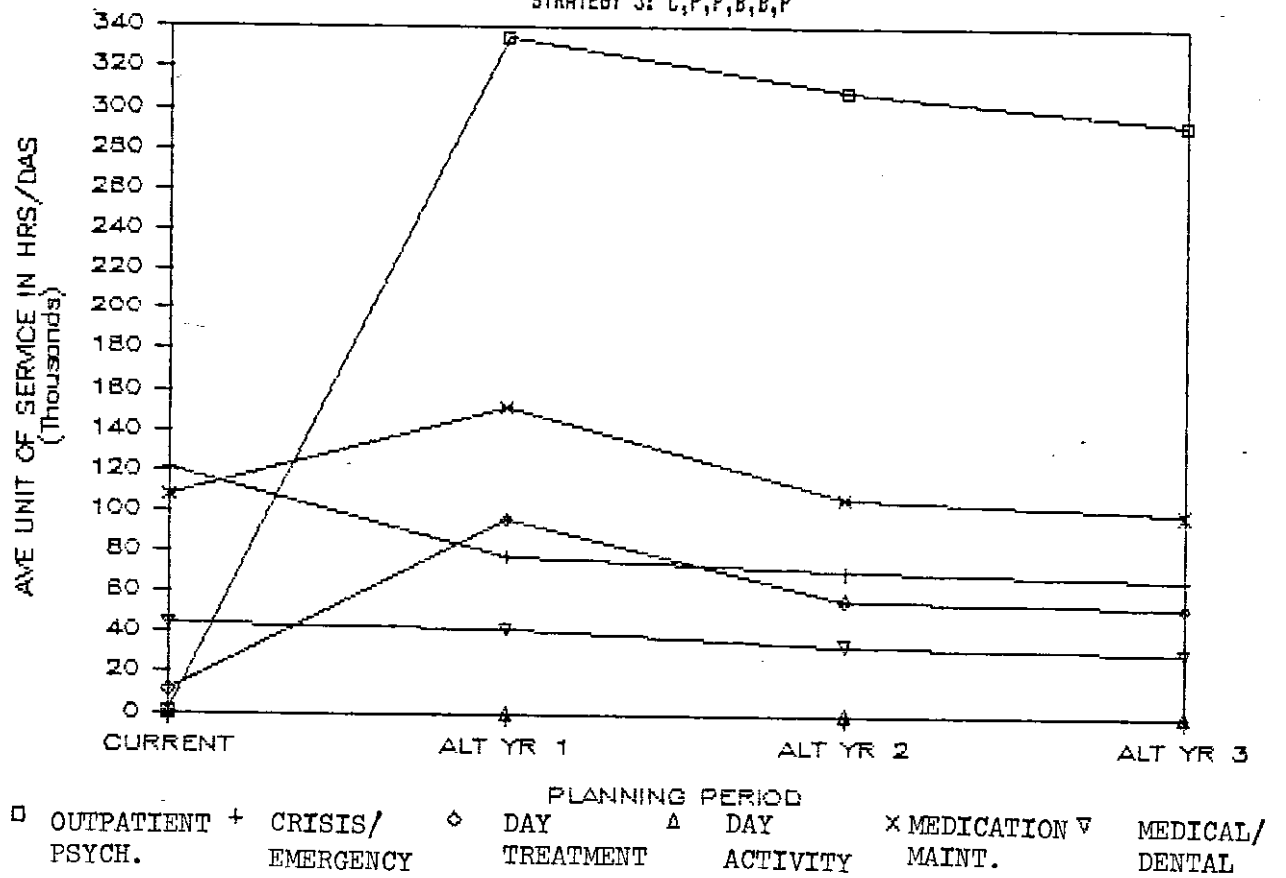


FIGURE 13

# ALABAMA REHAB. SERVS. UTILIZATION

STRATEGY 2: C,P,P,A,B,B

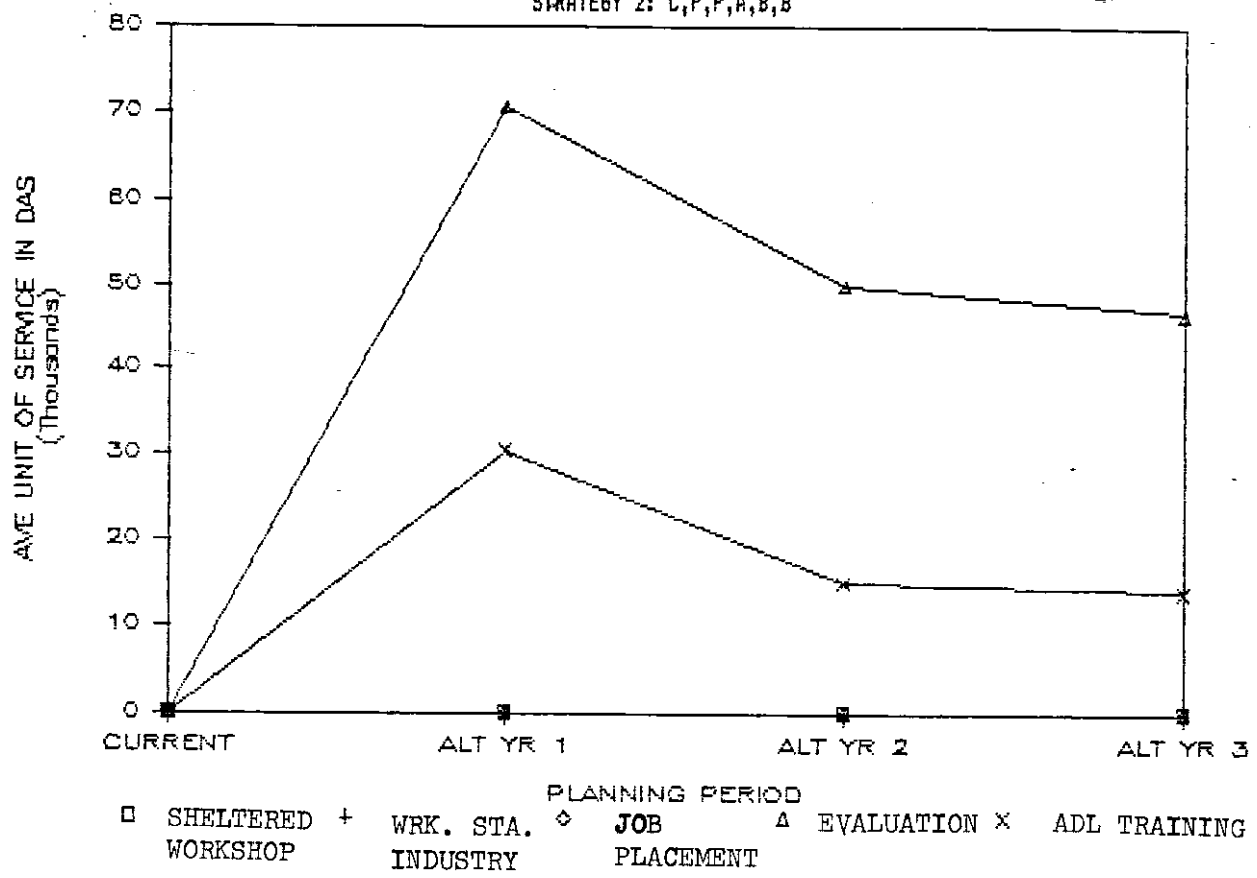


FIGURE 14

# ALABAMA REHAB. SERVS. UTILIZATION

STRATEGY 3: C,P,P,B,B,P

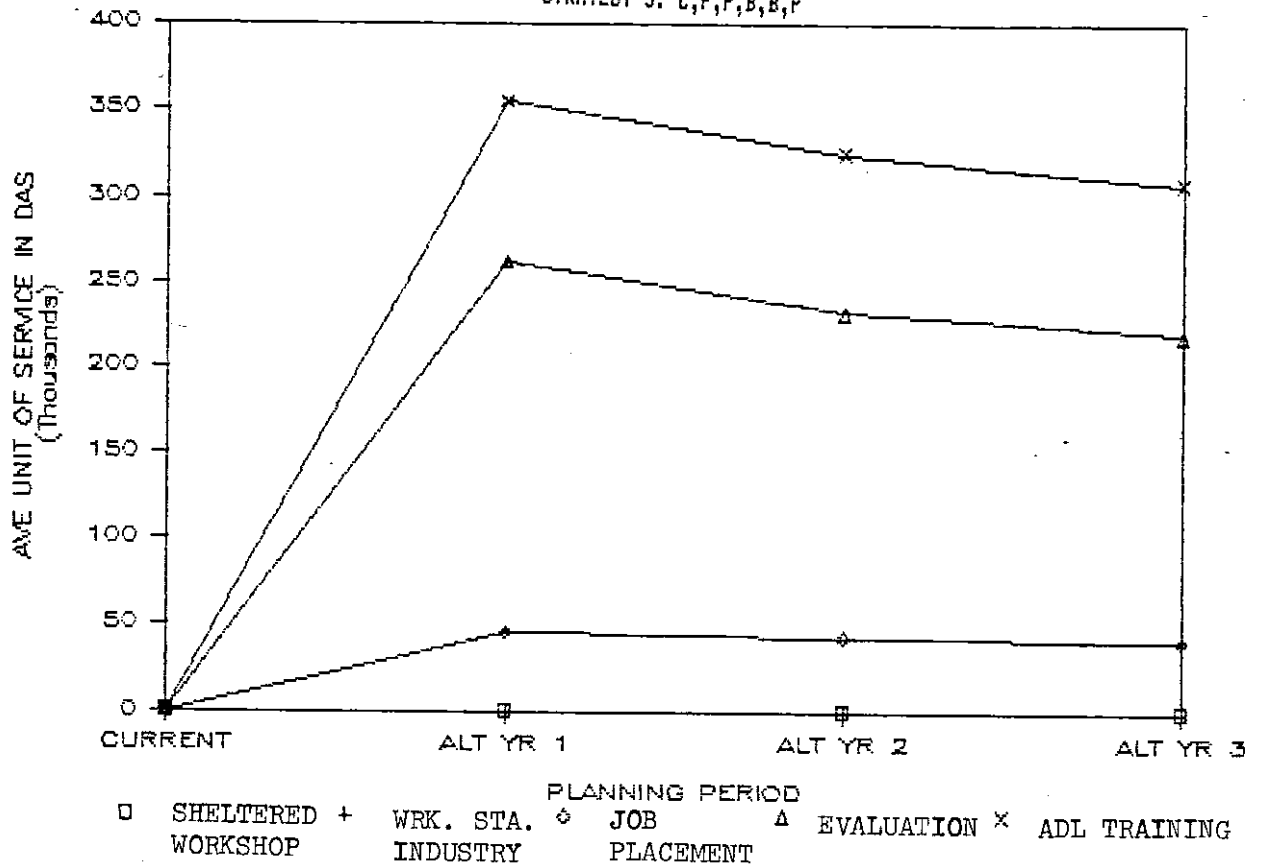


FIGURE 15

# ALABAMA SUPPORT SERVS. UTILIZATION

STRATEGY 2: C,P,P,A,B,B

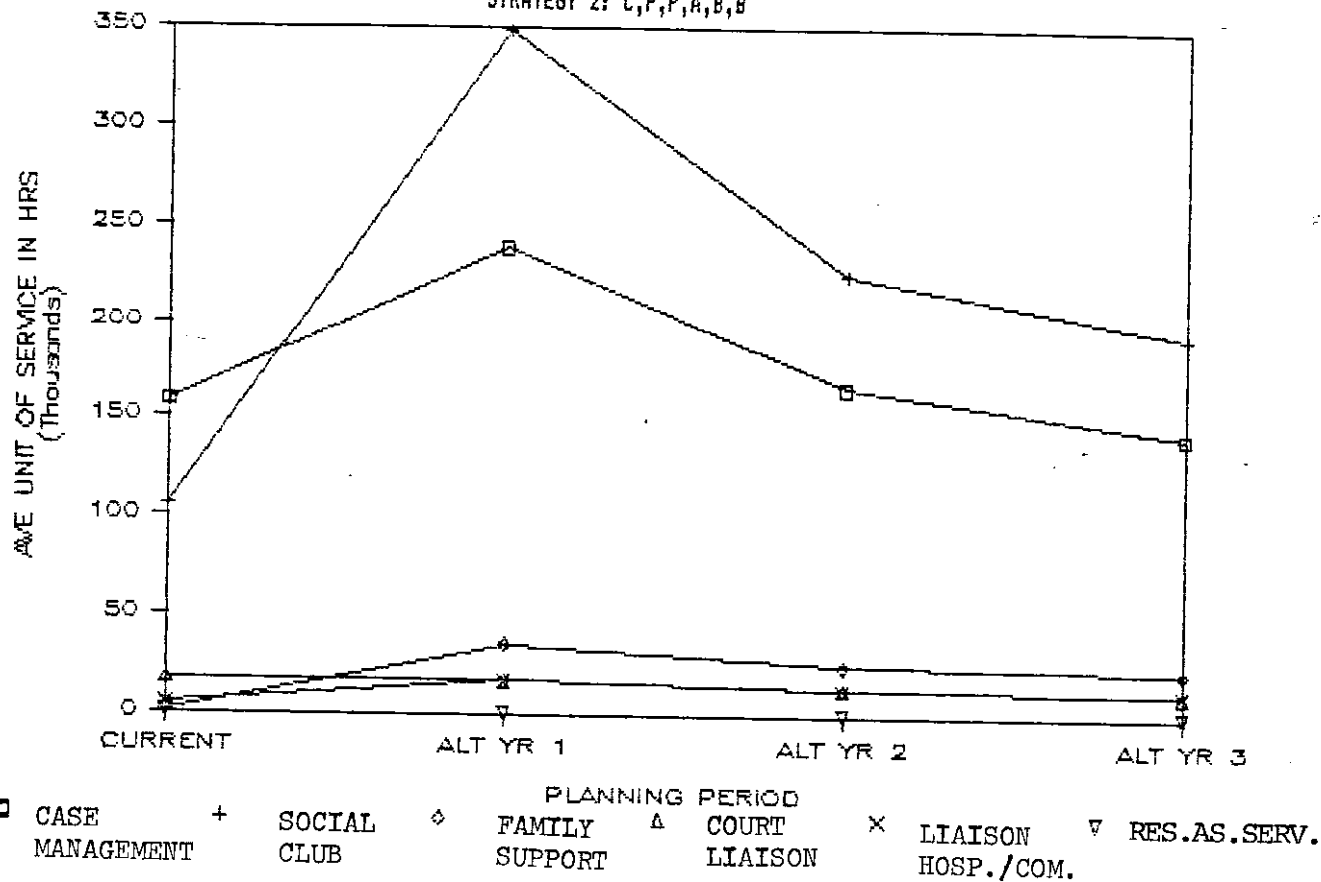


FIGURE 16



# ALABAMA SUPPORT SERVS. UTILIZATION

STRATEGY 3: C,P,P,B,B,P

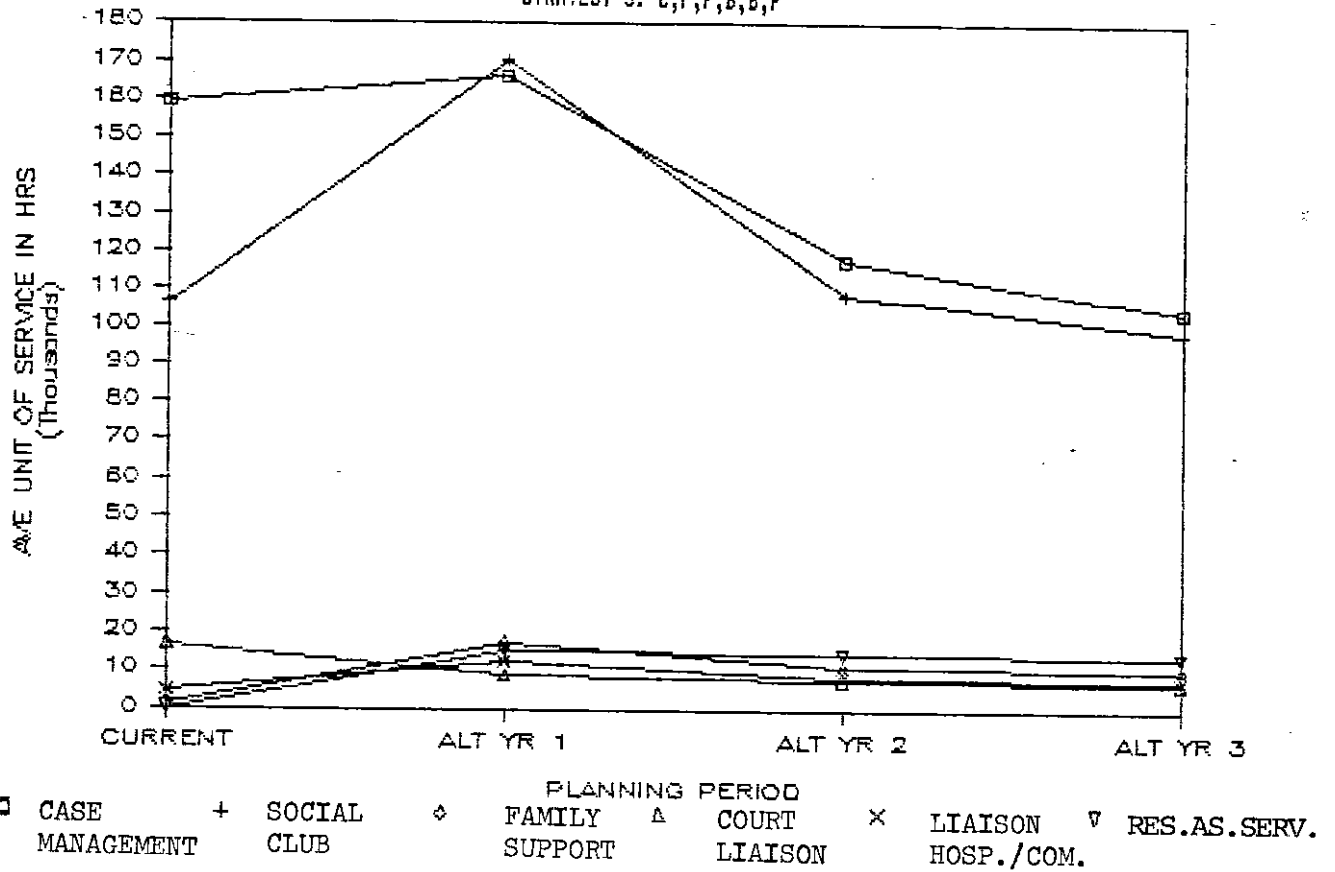


FIGURE 17

The amounts of service required by each of the strategies is presented in the HSRISIM (labeled ALSIM) rough output contained in Appendix C. These outputs are labeled according to the service packages assigned to each functional level (e.g., C,C,C,B,B,B). The amounts of services required by each strategy can be found in the tables labeled Resource Output Table. Note that Appendix C also contains selected examples of HSRILP rough output (labeled ALLP).

#### GEOGRAPHIC CONSIDERATIONS

Table 17 and 18 present, by community mental health center, the number of clients currently in and arriving to the Alabama mental health system. Some of the rural CMHCs may not have sufficient client volume to provide, on a local basis, all of the services their clients require. In such cases it may be necessary to create larger service areas. These multi-catchment area service areas should meet two criteria: first the catchment areas should be accessible enough to each other for clients from one catchment area to attend services in another; second, the total number of clients in each service area should be as large as possible. Once such service areas are defined, HSRI will use HSRISIM to identify service needs and costs for the various multi-catchment area service areas.

TABLE 17  
FACILITY BY FUNCTIONAL LEVEL FOR "CURRENT" POPULATION

NAME	#	CASES 1/25	FL1 %	FL1 #	FL2 %	FL2 #	FL3 %	FL3 #	FL4 %	FL4 #	FL5 %	FL5 #	FL6 %	FL6 #	FL7 %	FL7 #	TOTAL %	TOTAL #
RIVERBEND	1	923	2.80%	26	5.60%	52	5.60%	52	13.90%	128	36.10%	333	34.70%	320	1.40%	13	100%	924
NORTH CENTRAL	2	864	0.00%	0	13.80%	119	12.10%	105	22.40%	194	34.50%	298	17.20%	149	0.00%	0	100%	864
HUNTSVILLE	3	1207	1.12%	13	8.97%	108	7.74%	93	17.00%	205	31.87%	385	32.51%	392	0.82%	10	100%	1207
NORTHWEST	4	589	0.00%	0	10.00%	59	8.30%	49	31.70%	187	26.70%	157	23.30%	137	0.00%	0	100%	589
JBS AUTHORITY	5	271	0.00%	0	10.00%	27	22.00%	60	22.00%	60	18.00%	49	28.00%	76	0.00%	0	100%	271
WESTERN	5	1508	0.00%	0	15.70%	237	7.40%	112	22.30%	336	50.40%	760	4.10%	62	0.00%	0	100%	1506
EASTSIDE	5	1010	1.00%	10	7.20%	73	11.30%	114	15.50%	157	39.20%	396	23.70%	239	2.10%	21	100%	1010
UAB	5	2268	1.70%	39	7.80%	177	5.00%	113	12.80%	290	28.50%	646	43.60%	989	0.60%	14	100%	2268
CED	6	988	0.00%	0	25.00%	247	0.00%	0	25.00%	247	0.00%	0	50.00%	494	0.00%	0	100%	988
CALHOUN/CLEBUR	7	839	0.00%	0	5.30%	44	3.20%	27	4.20%	35	26.30%	221	50.50%	424	10.50%	88	100%	839
INDIANS RIVERS	8	1273	3.20%	41	5.60%	71	13.50%	172	23.00%	293	32.50%	414	22.20%	283	0.00%	0	100%	1273
CHEAHA	9	764	0.80%	6	9.00%	69	9.80%	75	24.80%	189	23.30%	178	32.30%	247	0.00%	0	100%	764
WEST ALA	10	366	0.00%	0	6.90%	25	10.30%	38	17.20%	63	34.50%	126	31.00%	113	0.00%	0	100%	366
CHILTON SHELBY	11	384	1.50%	6	16.40%	63	10.40%	40	6.00%	23	34.30%	132	31.30%	120	0.00%	0	100%	384
EAST ALA	12	1421	4.80%	68	2.00%	28	4.80%	68	13.60%	193	55.10%	783	19.70%	280	0.00%	0	100%	1421
CAHABA	13	730	1.10%	8	6.50%	47	10.80%	79	21.50%	157	25.80%	188	32.30%	236	2.20%	16	100%	731
MONTGOMERY	14	1451	0.00%	0	4.20%	61	5.90%	86	17.80%	258	60.20%	874	11.90%	173	0.00%	0	100%	1451
EAST CENTRAL	15	617	0.00%	0	11.40%	70	4.50%	28	9.10%	56	25.00%	154	50.00%	309	0.00%	0	100%	617
MOBILE	16	2204	4.50%	99	11.90%	262	14.40%	317	8.50%	187	32.30%	712	27.40%	604	2.00%	44	101%	2226
SOUTHWEST	17	474	0.00%	0	10.00%	47	10.00%	47	10.00%	47	36.00%	171	34.00%	161	0.00%	0	100%	474
SOUTH CENTRAL	18	655	0.00%	0	0.00%	0	0.00%	0	40.00%	262	10.00%	66	50.00%	328	0.00%	0	100%	655
WIREGRASS	19	1208	4.30%	52	8.00%	97	6.20%	75	14.20%	172	30.20%	365	37.00%	447	0.00%	0	100%	1207
MARSHALL/JACK	20	823	0.00%	0	11.50%	95	0.00%	0	7.70%	63	34.60%	285	46.20%	380	0.00%	0	100%	823
BALDWIN	21	406	0.00%	0	2.60%	11	2.60%	11	7.90%	32	39.50%	160	47.40%	192	0.00%	0	100%	406
AVG. % /SUBTOT		23243	1.12%	368	8.97%	2090	7.74%	1759	17.00%	3835	31.87%	7852	52.51%	7154	0.82%	206	100%	23264
BRYCE			4.20%	53	47.00%	593	23.90%	301	12.30%	155	8.70%	110	3.30%	42	0.60%	7	100%	1261
SEARCY			6.20%	40	35.40%	230	32.00%	208	15.70%	102	7.70%	50	2.80%	18	0.30%	2	100%	650
NARH			7.20%	9	36.00%	45	18.40%	23	14.40%	18	15.20%	19	8.80%	11	0.00%	0	100%	125
GREIL			8.30%	4	47.90%	23	14.60%	7	12.50%	6	10.40%	5	6.30%	3	0.00%	0	100%	48
TAAC			0.70%	11	29.90%	44	22.40%	33	24.50%	36	16.30%	24	5.40%	8	0.70%	1	100%	157
SUBTOT			5.32%	117	39.24%	935	22.26%	572	15.88%	317	11.66%	208	5.32%	82	0.32%	10	100%	2241
GRAND TOTAL				485		3025		2331		4152		8060		7236		216		25505

TABLE 18  
FACILITY BY FUNCTIONAL LEVEL FOR "ARRIVAL" POPULATION

NAME	#	FL1 #	FL1 %	FL2 #	FL2 %	FL3 #	FL3 %	FL4 #	FL4 %	FL5 #	FL5 %	FL6 #	FL6 %	FL7 #	FL7 %	TOTAL #	TOTAL %
RIVERBEND	1	5.3%	15.8%	6	10.5%	4	6.7%	0	0.0%	10.5%	4	20	52.6%	2	5.3%	2	100%
NORTH CENTRAL	2	6.7%	0.0%	0	0.0%	0	0.0%	2	6.7%	6.7%	2	24	80.0%	0	0.0%	0	100%
HUNTSVILLE	3	4.7%	7.6%	5	5.7%	3	5.7%	5	9.0%	23.1%	14	28	45.9%	2	3.9%	2	100%
HORTHWEST	4	5.3%	0.0%	0	0.0%	0	0.0%	0	0.0%	36.8%	14	22	57.9%	0	0.0%	0	100%
JBS AUTHORITY	5	0.0%	0.0%	0	0.0%	0	0.0%	0	0.0%	0.0%	0	0	0.0%	0	0.0%	0	0%
WESTERN	5	0.0%	27.3%	6	9.1%	2	3.1%	6	27.3%	36.4%	8	0	0.0%	0	0.0%	0	100%
EASTSIDE	5	3.1%	6.3%	4	3.1%	2	3.1%	4	9.4%	21.9%	14	36	56.3%	0	0.0%	0	100%
UAB	5	0.0%	15.0%	12	15.0%	0	0.0%	4	5.0%	20.0%	16	42	52.5%	6	7.5%	6	100%
CED	6	4.0%	12.0%	6	12.0%	0	0.0%	4	8.0%	24.0%	12	24	48.0%	2	4.0%	2	100%
CALHOUN/CLEBUR	7	0.0%	0.0%	0	0.0%	0	0.0%	0	0.0%	14.3%	2	12	85.7%	0	0.0%	0	100%
INDIANS RIVERS	8	3.4%	13.8%	8	10.3%	6	6.9%	4	6.9%	20.7%	18	26	44.8%	0	0.0%	0	100%
CHEAHA	9	5.1%	5.1%	4	10.3%	8	15.4%	12	15.4%	23.1%	18	32	41.0%	0	0.0%	0	100%
WEST ALA	10	10.0%	0.0%	2	0.0%	2	10.0%	2	10.0%	30.0%	6	0	0.0%	0	40.0%	0	100%
CHILTON SHELBY	11	0.0%	20.0%	0	0.0%	2	20.0%	2	20.0%	20.0%	2	2	20.0%	0	0.0%	0	100%
EAST ALA	12	7.3%	0.0%	0	0.0%	0	0.0%	12	10.9%	41.8%	46	44	40.0%	0	0.0%	0	100%
CAHABA	13	5.3%	5.3%	2	5.3%	2	5.3%	6	15.8%	10.5%	4	12	31.6%	10	26.3%	10	100%
MONTGOMERY	14	3.0%	18.2%	12	18.2%	16	24.2%	2	3.0%	18.2%	12	22	33.3%	0	0.0%	0	100%
EAST CENTRAL	15	6.3%	6.3%	2	6.3%	2	6.3%	2	6.3%	12.5%	4	16	50.0%	4	12.5%	4	100%
MOBILE	16	4.4%	8.9%	8	8.9%	8	8.9%	16	17.8%	20.0%	18	36	40.0%	0	0.0%	0	100%
SOUTHWEST	17	13.3%	0.0%	0	0.0%	2	6.7%	2	6.7%	20.0%	6	16	53.3%	0	0.0%	0	100%
SOUTH CENTRAL	18	12.9%	4.8%	4	6.5%	2	3.2%	2	3.2%	25.8%	16	30	48.4%	0	0.0%	0	100%
WIREGRASS	19	0.0%	4.8%	2	4.8%	0	0.0%	6	14.3%	19.0%	8	18	42.9%	8	19.0%	8	100%
MARSHALL/JACK	20	0.0%	0.0%	0	0.0%	0	0.0%	2	7.1%	21.4%	6	20	71.4%	0	0.0%	0	100%
BALDWIN	21	0.0%	0.0%	0	0.0%	0	0.0%	0	0.0%	30.0%	6	14	70.0%	0	0.0%	0	100%
AVG. % /SUBTOT		4.7%	7.6%	83	5.7%	61	9.0%	97	9.0%	23.1%	250	496	45.9%	42	3.9%	42	100%
BRYCE	20	25.0%	47.5%	38	2.5%	2	2.5%	4	5.0%	17.5%	14	2	2.5%	0	0.0%	0	100%
SEARCY	4	11.9%	76.5%	26	0.0%	0	0.0%	0	0.0%	11.8%	4	0	0.0%	0	0.0%	0	100%
WARH	2	14.3%	42.9%	6	14.3%	2	14.3%	2	14.3%	14.3%	2	0	0.0%	0	0.0%	0	100%
GREIL	0	0.0%	100.0%	4	0.0%	0	0.0%	0	0.0%	0.0%	0	0	0.0%	0	0.0%	0	100%
TAAC	0	0.0%	0.0%	0	0.0%	0	0.0%	0	0.0%	0.0%	0	0	0.0%	0	0.0%	0	0%
SUBTOT	26	0.0%	0.0%	74	0.0%	4	0.0%	6	0.0%	0.0%	20	2	0.0%	0	0.0%	0	0%
GRAND TOTAL	77		157	65	103	270	498	42									

NOTE: WORKSHEET USED TO CALCULATE ESTIMATE FOR HUNTSVILLE AND ESTIMATES FOR TOTAL POPULATION OF ARRIVALS