PROGRAMMING
AN AMBULATORY HEALTH CARE FACILITY

for delaware county, indiana

a thesis program for the college of architecture and planning
ball state university muncie, indiana

stanley r. combs
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0.0 FORMAT

0.1 Proposal
Program and design a non-emergency outpatient, health care facility, as part of an organized network of comprehensive health care services and facilities within the Muncie, Standard Metropolitan Statistical area.

0.2 Project summary
Available statistics show clearly that the demand for outpatient health care services is increasing at a rapid rate, reflecting serious unmet health care needs. This program is an attempt to recognize the need for more efficient and economical solutions to these problems.

Optimum health care today must of necessity have certain characteristics. It must be based on the scientific method, be applied in a personalized manner with full recognition and attention to personal dimensions in patient needs, and be carried out within a framework of social responsibility. Each of these components must be continuously redefined in light of new knowledge.

Optimum health care should be accessible to every person in his community or through regional arrangements. This group would include all age groupings and social classes. It is hoped through the adoption of prepayment plans and government subsidies in addition to the typical fee-for-service system, that economic barriers will be removed.

The Health care facility will be designed as a link in an organized network of comprehensive health care services within the Muncie Standard Metropolitan statistical area. Health care services for this area are established by a framework consisting of Ball Hospital, an outpatient health care unit, mobile helath care units, and the existing health care facilities located there.

The Health care facility will be planned and designed so as to promote comprehensive, preventive, diagnostic, curative, rehabilitative, outpatient health care services for the 150,000 residents of the Muncie Standard Metropolitan Statistical Area. Due to the social implications of a comprehensive health care program, physical services as practiced today will be supplemented by dental care, minor surgical
procedures, laboratory facilities, social counseling, therapy facilities, radiological, and pharmaceutical facilities. Preventive-diagnostic medicine as practiced here would entail examination, consultation, and treatment on an outpatient basis, or referral to another facility if need be as in the case of serious health problems or conditions.

0.3 Methodology
The base data utilized in this program were obtained from a survey of existing conditions and documents, source materials listed in bibliography, interviews with Ball Hospital and Muncie Clinic personnel, and special critic, Robert A. Cochran, Director, Health Care Division for Fanning and Howey Architects and Engineers, Celina, Ohio.

The base data are contained in sections 1.0, 2.0, 3.0, 4.0, 5.0, and 6.0. This information is used in the formulation of projections and alternatives.

This program is keyed with a decimal numbering system which both replaces page numbers and serves as a method for cross-referencing. The keying number is listed on each sheet.

This format is conceived as a growing non-static process and has provisions in the decimal numbering system for future additions as the programming and planning process expands.

0.4 General contents
The following is a description of the major sections of this document and a key to understanding it's organizational framework.

<table>
<thead>
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<th>0 Format</th>
<th>General outline of the project and the document</th>
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<td>Documentation</td>
</tr>
</tbody>
</table>
1.0 TRENDS

1.1 Outpatient visits per day have been increasing at the rate of 6.8% per year and will continue to increase at an even faster rate than before.

1.2 Hospital expenditures have been increasing at the rate of 11% per year and will continue to increase.

1.3 Outpatient clinics have increased in numbers in an attempt to solve health needs of the community, they will increase in numbers and scope of service.

1.4 Additional financial help can be expected from the government in financing the development, construction, and operation of comprehensive health care centers, especially those aimed at preventive health care.

1.5 The adoption of prepayment medical-dental plans for preventive, maintenance care will become more and more common, through the government, private individuals, and insurance companies.

1.6 Rising incomes and levels of education are accompanied by increased demand for better health care facilities and services.

1.7 Quality, comprehensive health care is non becoming thought of as an inherent right of every individual, not just a privilege for those who can financially afford it.
2.0 POLICY

2.1 Patients will be accepted on a basis of scheduled appointments, and referrals in addition to walk-in patients.

2.2 The emphasis of the health care center will be preventive medicine.

2.3 The facility will be a primary input center in the total health care system.

2.4 The facility shall provide aid, advice, and referral to those requesting who are in a state of "Eco-social-environmental need".

2.5 Provide this service for the residents of Delaware County, Indiana, and to wayfarers.

2.6 Provide this service on a weekly, six day, nine hour per day, fifty four hour week basis.

2.7 Assist other organizations and individuals in programs to relieve the causes of health problems.

2.8 Cooperate fully with other related agencies and work towards a total, comprehensive, health care network incorporating social, mental, physical, and dental health care systems.

2.9 Provide a facility to coordinate and conduct these activities.

2.10 Process any funds necessary and appropriate to the construction and, or operation of the facility.

2.11 Aid and assist the medical profession in any legally permissible scientific research project relating to health conditions of the public.
3.0 BACKGROUND

3.1 Climatic conditions

3.1.1 The prevailing winds come from the southwest in spring, summer, and fall. They average approximately 10 miles per hour. In the winter the winds are essentially from the northwest.

3.1.2 The temperatures average for January (27°F), February (28°F), March (40°F), April (50°F), May (61°F), June (72°F), July (74°F), August (73°F), September (66°F), October (54°F), November (41°F), December (30°F) with the annual average approximately 51°F. The Munroe area has the shortest growing season and the longest period of freezing temperatures in the state.

3.1.3 The frost line is approximately 3 feet.

3.1.4 The average monthly measurement of precipitation shows January (2.8"), February (2.0"), March (3.5"), April (3.5"), May (3.8"), June (3.7"), July (3.0"), August (3.2"), September (3.6"), October (2.5"), November (2.8"), December (2.7") and the annual precipitation total measures 37.5". The average annual snowfall measures 20-25 inches.

3.1.5 The cloud cover daily average for winter measures (75-80%), spring (65-75%), summer (50-60%), and fall (50-70%).

3.2 Area definition

3.2.1 Delaware County lies in the east central region of Indiana and is surrounded by the counties of Grant, Blackford, Jay, Randolph, Henry, and Madison. Muncie is the central city of the region and the only area with an extensive manufacturing and industrial base. The remaining land area of the county supports agricultural land uses, especially for the growing of crops such as corn, soybeans, alfalfa, and winter wheat.

3.2.2 The regional transportation network consists of Highways 67 (north-south), 35 (north-south), 3 (north-south), 32 (east-west), and the Highway 67 bypass. Within Muncie the primary arteries are Madison Avenue (north-south), Jackson Street (east-west), Wheeling Avenue (north-south), Kilgore Avenue (east-west), Walnut Street (north-south), and Tillotson Avenue (north-south). In addition there exists airport facilities, inter-city and intra-city bus routes, and several railroads.
3.2.3 Land usage within the county is essentially limited to agricultural production except for the Muncie proper area. Here we find the industrial and manufacturing bases for the county, which provides most of the residents of the area with job opportunities.

3.2.4 Utilities are provided to most residents by the public service companies: Bell Telephone, Indiana and Michigan Electric Company, Muncie Water Works.

3.2.5 The Delaware County population can be projected by analyzing the results of the 1960 and the 1970 census data.

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>129,000</td>
<td></td>
</tr>
<tr>
<td>1975</td>
<td>139,700</td>
<td>8.3%</td>
</tr>
<tr>
<td>1980</td>
<td>151,100</td>
<td>8.2%</td>
</tr>
<tr>
<td>1985</td>
<td>163,300</td>
<td>8.1%</td>
</tr>
</tbody>
</table>

3.2.6 The land is zoned only in the Muncie proper area.

3.3 Indiana

3.3.1 The population of Indiana is 5,193,669 persons. This includes 65% urban and 35% rural residences.

3.3.2 The Indiana population can be broken into 3 groupings: under 18 (35%), 18-64, (55.5%), and 65 and over (9.5%).

3.3.3 The Indiana population increased 11.4% from 1960-1970.

3.3.4 The general population characteristics include: whites (93%), blacks (7%), male (49%), female (51%).

3.3.5 The social characteristics of the population include: native born of native parentage (91.5%), native born of foreign or mixed parentage (6.5%), and foreign born (2%).

3.3.6 Schooling statistics show an enrollment of 29% of the population, the years completed averages 12.1 years, High School graduates (52%).

3.3.7 Transportation statistics show the auto being used 70% of time for work transportation, passengers accounting for 12.5% in addition, bus and walking were others mentioned.
3.3.8 The residence statistics showed 73\% in the same home as 5 years ago, most movement was within the same county.

3.3.9 The labor force shows 2,016,365 employed workers, males (60\%), female (40\%).

3.3.10 The income of families showed a mean of $10,959, and a median income of $9970.

3.3.11 A survey of housing units showed the average rooms per unit as 5.0 rooms, a contract rent median of $82, and a median value per unit of $13,800.

3.4 Muncie Standard Metropolitan Statistical Area (Delaware County)

3.4.1 The Muncie S.M.S.A. consists of 396 square miles with a population of 129,219 (326 persons per square mile).

3.4.2 The urban population represents 70\% of the total population while the rural population represents but 30\% of the total.

3.4.3 The S.M.S.A. population can be broken into 3 groupings: under 18 (33\%), 18-64 (59\%), and 65 and over (8\%).

3.4.4 The population increased 16.5\% over the last 10 years with most growth occurring in the urban area.

3.4.5 The Muncie S.M.S.A. consists of Center Township, Hamilton Township, Liberty Township, Mount Pleasant Township, Yorktown, and Muncie.

3.4.6 The general characteristics of the population show whites (94.5\%), blacks (5.5\%), males (48.5\%), and females (51.5\%).

3.4.7 The social characteristics show: native born of native parentage (97.5\%), native born of foreign or mixed parentage (2\%); and foreign born or mixed parentage (.5\%).

3.4.8 The schooling statistics show an enrollment of 33\% of the population. The years of school completed tallied an average of 12.1 years with a graduation rate of 52\%. 
3.4.9 The means of transportation and place of work showed employed workers numbering 47,565. The private auto accounted for 74% of the persons' means to their jobs, passengers accounted for 11.5% of the work transportation means, with 8.5% walking to their jobs, no other means accounted for over 2%.

3.4.10 The place of residence in Muncie showed 43.5% in the same house as before, 25% in a different house in that S.M.S.A., and 31% from other areas.

3.4.11 The labor force statistics show employed workers numbering 49,453.

3.4.12 Income characteristics show a median income of $9,578 and a mean income of $10,884.

3.4.13 A survey of housing units shows the average rooms per unit as 4.9. The median value per unit was $13,200 with a contract rent median of $80.

3.5 Muncie

3.5.1 The population of Muncie is 69,080 persons.

3.5.2 The age groupings can be broken into three major groupings: under 18 (38%), 18-64 (52.5%), and 65 and older (9.5%).

3.5.3 The population grew .7% from 1960-1970.

3.5.4 The general population characteristics include: whites (90%), blacks (10%), males (47.5%), and females (52.5%).

3.5.5 The social characteristics show that the native born of native parentage (96.5%), are compared with native born of foreign or mixed parentage (2.5%), and foreign born or mixed parentage (1.0%).

3.5.6 Schooling statistics show an enrollment statistic of 34.5%, years completed as averaging 11.7 and per cent of high school graduates 47.5%.
3.5.7 Transportation and place of work showed the auto as transportation (68%), passengers of autos (12.5%), walking (13.5%) and no other transportation means measuring over 2.0%.

3.5.8 Residency statistics show 45% in the same house as 5 years ago, 26.5% in that same S.M.S.A., and 29.5% in another area entirely.

3.5.9 The labor force statistics show 26,200 employed persons, males (60.5%), females (39.5%).

3.5.10 The income figures show a mean income of $10,182 and the median income of $6752.

3.5.11 A survey of housing units shows an average of 4.7 rooms per unit with a median value per unit of $11,200.

3.6 Tract 8

3.6.1 The population of the tract is 5164 persons.

3.6.2 The age groupings can be broken into three basic groups: under 18 (31%), 18-64 (57%), 65 and over (12%).

3.6.3 Tract growth is occurring in an outward, westward direction.

3.6.4 General population characteristics show whites (99.3%), blacks (.7%), males (47%), and females (53%).

3.6.5 The social characteristics show that the residents who are native born of native parentage are 94.5%, native born of foreign or mixed parentage show 4% of the total, and foreign born number 1.5%.

3.6.6 Schooling statistics inform us of 34% of the public enrolled in school, the years of school completed as averaging 12.9, and the per cent of high school graduates as 76.7%.

3.6.7 The means of transportation and place of work tell us that 78% drive to work with 8.7% as passengers, and 9.5% walked to work.

3.6.8 The residency statistics show that 48% live in the same house as 5 years ago, 24% lived previously in the same S.M.S.A., and 28% had lived outside this area.
3.6.9 The labor force statistics show 2219 employed persons, males (58%), and females (42%).

3.6.10 The income figures show a mean income of $13,588, and a median income of $11,237.

3.6.11 A survey of housing units shows an average of 5.1 rooms per unit with a median value per unit of $17,400.

3.7 Codes and ordinances
3.7.1 State of Indiana Building Code

3.7.2 Indiana State Board of Health
   3.7.2.1 Division of Hospital and Institutional services.
   3.7.2.2 Division of Sanitary Engineering.

3.7.3 City of Muncie Plumbing and Sewer Codes

3.7.4 This facility is classified as a hospital, group D, Division 2, Type 1, construction by code requirements.
4.0 RELATED UNITS

4.1 Ball Hospital is the only hospital within the Muncie S.M.S.A. and is located in the center of the county.

4.2 Physicians within the Muncie area number 121.

4.3 Clinics within the Muncie area number 7.

4.4 Psychiatrists within the Muncie area number 4.

4.5 Dentists within the Muncie area number 40.

4.6 Nursing Homes (geriatric centers) and extended care units within the Muncie area number 9.
5.0 INVENTORY

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6.0 FINANCIAL

6.1 Sources of funds for capital and operational expenditures

6.1.1 Hill-Burton Funds are for construction and
combination, and come in the form of grants,
guaranteed loans, and direct loans.

6.1.2 Private loans which are backed by the
Department of Health, Education, and Welfare
are capable of guaranteeing repayment of
principal and interest when issued.

6.1.3 The Comprehensive Health Planning Program
allows federal funding for Comprehensive
Health Care facilities.

6.1.4 The National Center for Health Services
Research and Development supplies grants
and contracts for systems of improving
distribution and utilization of health
services, and to containing the costs of
medical care.

6.1.5 The National Institutes of Health makes
available grants for Nurses Training,
Allied Health Professions Training, teaching
hospitals construction, Research Grants,
General Clinical Research Centers, Health
Research Facilities Construction, Medical
Library and Health Communications Assistance.

6.1.6 The Department of Health, Education, and
Welfare makes possible surplus property
transfers and donations for health care
centers.

6.1.7 The Department of Housing and Urban Develop-
ment provides for mortgage insurance for
hospitals, group medical practice facilities,
and loans to public facilities.

6.1.8 The Office of Economic Opportunity grants
monies through the Model Cities Program for
construction of neighborhood health centers.

6.1.9 The Small Business Administration provides
loans and guarantees for loan repayment.
6.1.10 The Department of Congress through the Economic Development Administration grants loans for health facilities, especially in low income, high unemployment areas.

6.1.11 Private Capital could be used for the construction and operation of the facility.

6.1.12 Commercial loans are available through banks and various other financial institutions.

6.1.13 Prepayment Plans are now becoming available for Comprehensive Medical Dental Care through various private insurance companies and in the near future through government programs. These plans will be applicable for both individuals and groups.

6.1.14 Medicare is available for the aged.

6.1.15 Medicaid is available for those of low income.

6.1.16 The self-pay system of paying will be a common practice as the services rendered are paid for by the individual on a cash or credit billing systems.

6.1.17 Other medical facilities or hospitals may contract this facility to do work or perform services which they deem to their economic or efficiency advantage.

6.2 Construction Costs
New construction costs for buildings of this type run about $35.00 per square foot. Costs can be expected to rise in the future due to new health care systems, medical technology innovations, rising labor costs, and rising materials costs.
7.0 PROJECTIONS

7.1 Projections are descriptions of series of events that have the probability of happening from a period extending from the present to some time in the future. In this instance, the projection is made to the year 1985. Naturally, the nearer to the present, the higher the probability of accuracy will be. The projections are based on data from the 1960 Census, 1970 Census, Ball Hospital Outpatient Discharge Records for 1970 and 1971, Muncie Family Practice Outpatient Clinic Records for 1971, Parkview Hospital, Fort Wayne, Outpatient Facilities Program, and Projections for Health Care Facilities evaluated in Modern Hospital and J.A.H.A. magazines.

7.1.1 The per cent of patients from Delaware County based on data from Ball Hospital Discharge Records on Outpatients for 1970 and 1971, shows 78% of these patients were from the county. As an outpatient service is developed aside from the hospitals own facilities, it will attract more scheduled outpatients and outpatient walk-ins who live in the geographic proximity of the facility. As the outpatient group increased in number, its proportion of members from out of the county will also increase. Then the per cent of outpatients from the county could be projected as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>% of Patients from Delaware County</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>78%</td>
</tr>
<tr>
<td>1975</td>
<td>80%</td>
</tr>
<tr>
<td>1980</td>
<td>80%</td>
</tr>
<tr>
<td>1985</td>
<td>80%</td>
</tr>
</tbody>
</table>
7.1.2 The per cent of Delaware County residents served by Ball Hospital as indicated by Discharge Records shows that approximately 90% of the residents of Delaware County are served by their facilities. For the development of the outpatient area this rate will be held constant, as the service pattern will quite probably remain nearly the same, especially since this statistic is so high.

<table>
<thead>
<tr>
<th>Year</th>
<th>% of Delaware County Residents Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>90%</td>
</tr>
<tr>
<td>1975</td>
<td>91%</td>
</tr>
<tr>
<td>1980</td>
<td>91%</td>
</tr>
<tr>
<td>1985</td>
<td>91%</td>
</tr>
</tbody>
</table>

7.1.3 The outpatient service population for a given year can be calculated from the following formula:

\[
\text{Service Population} = \left( \frac{\text{Delaware County Population}}{\% \text{ of Delaware County resident serve}} \right) \times \left( \frac{\text{Delaware County population}}{\% \text{ of patient from Delaware county}} \right)
\]

<table>
<thead>
<tr>
<th>Year</th>
<th>Service Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>150,000</td>
</tr>
<tr>
<td>1975</td>
<td>158,000</td>
</tr>
<tr>
<td>1980</td>
<td>172,000</td>
</tr>
<tr>
<td>1985</td>
<td>186,000</td>
</tr>
</tbody>
</table>
7.1.4 The outpatient visit rate is defined as the number of outpatient visits per 1000 service population per year. In 1971, this rate for Ball Hospital was approximately 700 visits per 1000 service population. It has been noted that nationally, non-emergency outpatient visit rates will more than double in the next 10 years. For given facilities growth should be held in check by competing health care units or new patterns in health care. With these considerations in mind the planned growth for outpatient facilities should be as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>% Increase</th>
<th>Rate/1000 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>...</td>
<td>700</td>
</tr>
<tr>
<td>1971</td>
<td>4%</td>
<td>728</td>
</tr>
<tr>
<td>1972</td>
<td>8%</td>
<td>785</td>
</tr>
<tr>
<td>1973</td>
<td>12%</td>
<td>880</td>
</tr>
<tr>
<td>1974</td>
<td>12%</td>
<td>975</td>
</tr>
<tr>
<td>1975</td>
<td>10%</td>
<td>1070</td>
</tr>
<tr>
<td>1976</td>
<td>10%</td>
<td>1180</td>
</tr>
<tr>
<td>1977</td>
<td>8%</td>
<td>1275</td>
</tr>
<tr>
<td>1978</td>
<td>8%</td>
<td>1375</td>
</tr>
<tr>
<td>1979</td>
<td>6%</td>
<td>1450</td>
</tr>
<tr>
<td>1980</td>
<td>6%</td>
<td>1540</td>
</tr>
<tr>
<td>1981</td>
<td>6%</td>
<td>1630</td>
</tr>
<tr>
<td>1982</td>
<td>4%</td>
<td>1700</td>
</tr>
<tr>
<td>1983</td>
<td>4%</td>
<td>1768</td>
</tr>
<tr>
<td>1984</td>
<td>4%</td>
<td>1840</td>
</tr>
<tr>
<td>1985</td>
<td>4%</td>
<td>1920</td>
</tr>
</tbody>
</table>
7.1.5 The projection of outpatient visits per year is based on the formula:

Outpatient visits = (outpatient visit rate) x (service population in 1000's)

The outpatient visits in a given year should be as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Outpatient visit rate</th>
<th>Service population</th>
<th>Outpatient visits/year</th>
<th>Outpatient visits/week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>700</td>
<td>150,000</td>
<td>105,000</td>
<td>2020</td>
</tr>
<tr>
<td>1975</td>
<td>1070</td>
<td>158,000</td>
<td>169,000</td>
<td>3250</td>
</tr>
<tr>
<td>1980</td>
<td>1540</td>
<td>172,000</td>
<td>265,000</td>
<td>5100</td>
</tr>
<tr>
<td>1985</td>
<td>1920</td>
<td>186,000</td>
<td>356,000</td>
<td>6840</td>
</tr>
</tbody>
</table>

7.1.6 Projection and computation of visits and average outpatient flows is based on data from previous calculations and Hospital, J.A.H.A. magazine. It is assumed that outpatients will be processed in a 9-hour day, 5-day week.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>105,000</td>
<td>169,000</td>
<td>265,000</td>
<td>356,000</td>
</tr>
<tr>
<td>Average week</td>
<td>2,020</td>
<td>3,250</td>
<td>5,100</td>
<td>6,840</td>
</tr>
<tr>
<td>Average day</td>
<td>364</td>
<td>585</td>
<td>920</td>
<td>1,230</td>
</tr>
<tr>
<td>(18% of ave. wk.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average 3-hr. period</td>
<td>109</td>
<td>176</td>
<td>276</td>
<td>370</td>
</tr>
<tr>
<td>(30% of ave. day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum week</td>
<td>2,200</td>
<td>3,540</td>
<td>5,560</td>
<td>7,450</td>
</tr>
<tr>
<td>(1.08 times ave. wk.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum day</td>
<td>418</td>
<td>673</td>
<td>1,060</td>
<td>1,415</td>
</tr>
<tr>
<td>(19% of max. wk.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum 3-hr. period</td>
<td>142</td>
<td>230</td>
<td>360</td>
<td>482</td>
</tr>
<tr>
<td>(34% of max. day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7.1.7 The projection of outpatient contacts in an average week and in an average 3-hour period is based on data from the projection of visits in the outpatient facility. The figure for an average 3-hour period will be placed in parenthesis immediately following the respective figure for the average week:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatients</td>
<td>1.000</td>
<td>2020(109)</td>
<td>3250(176)</td>
<td>5100(276)</td>
<td>6840(370)</td>
</tr>
<tr>
<td>Admissions</td>
<td>.900</td>
<td>1820( 98)</td>
<td>2930(158)</td>
<td>4600(248)</td>
<td>6150(350)</td>
</tr>
<tr>
<td>Exam-treatment</td>
<td>.600</td>
<td>1220( 65)</td>
<td>1950(106)</td>
<td>3060(166)</td>
<td>4110(222)</td>
</tr>
<tr>
<td>E.K.G.</td>
<td>.050</td>
<td>61( 3)</td>
<td>98( 5)</td>
<td>153( 8)</td>
<td>206( 11)</td>
</tr>
<tr>
<td>Inhalation therapy</td>
<td>.050</td>
<td>61( 3)</td>
<td>98( 5)</td>
<td>153( 8)</td>
<td>206( 11)</td>
</tr>
<tr>
<td>Dental</td>
<td>.300</td>
<td>608( 30)</td>
<td>975( 50)</td>
<td>1530( 83)</td>
<td>2060(111)</td>
</tr>
<tr>
<td>Social worker</td>
<td>.020</td>
<td>41( 2)</td>
<td>65( 4)</td>
<td>102( 6)</td>
<td>137( 8)</td>
</tr>
<tr>
<td>Psychiatrist</td>
<td>.020</td>
<td>41( 2)</td>
<td>65( 4)</td>
<td>102( 6)</td>
<td>137( 8)</td>
</tr>
<tr>
<td>E.E.N.T.</td>
<td>.100</td>
<td>202( 10)</td>
<td>326( 18)</td>
<td>508( 28)</td>
<td>684( 38)</td>
</tr>
<tr>
<td>Diagnostic radiology</td>
<td>.300</td>
<td>608( 32)</td>
<td>975( 52)</td>
<td>1530( 83)</td>
<td>2060(111)</td>
</tr>
<tr>
<td>Laboratory</td>
<td>.500</td>
<td>1010( 54)</td>
<td>1620( 88)</td>
<td>2540(138)</td>
<td>3420(185)</td>
</tr>
<tr>
<td>Minor surgery</td>
<td>.100</td>
<td>202( 10)</td>
<td>362( 18)</td>
<td>508( 28)</td>
<td>682( 38)</td>
</tr>
<tr>
<td>Physical therapy</td>
<td>.150</td>
<td>31( 6)</td>
<td>49( 26)</td>
<td>77( 42)</td>
<td>103( 55)</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>.200</td>
<td>405( 21)</td>
<td>650( 35)</td>
<td>1020( 55)</td>
<td>1370( 74)</td>
</tr>
</tbody>
</table>
7.1.8 The projection of outpatient contacts in a maximum week and in a maximum 3-hour period is based on data from the projection of visits in the outpatient facility. The figure for maximum 3-hour period will be placed in parenthesis immediately following the respective figure for the maximum week:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of outpatients</td>
<td>1.00</td>
<td>2200(142)</td>
<td>3540(230)</td>
<td>5560(360)</td>
<td>7450(482)</td>
</tr>
<tr>
<td>Admission</td>
<td>.90</td>
<td>1980(128)</td>
<td>3180(206)</td>
<td>5000(324)</td>
<td>6700(434)</td>
</tr>
<tr>
<td>Exam-treatment</td>
<td>.60</td>
<td>1320( 85)</td>
<td>2120(138)</td>
<td>3340(216)</td>
<td>4470(289)</td>
</tr>
<tr>
<td>E.K.G.</td>
<td>.03</td>
<td>110( 7)</td>
<td>172( 12)</td>
<td>278( 18)</td>
<td>372( 24)</td>
</tr>
<tr>
<td>Inhalation therapy</td>
<td>.03</td>
<td>110( 7)</td>
<td>172( 12)</td>
<td>278( 18)</td>
<td>372( 24)</td>
</tr>
<tr>
<td>Dental</td>
<td>.30</td>
<td>660( 43)</td>
<td>1060( 69)</td>
<td>1670(108)</td>
<td>2240(145)</td>
</tr>
<tr>
<td>Social worker</td>
<td>.02</td>
<td>44( 3)</td>
<td>71( 5)</td>
<td>111( 7)</td>
<td>149( 9)</td>
</tr>
<tr>
<td>Psychiatrist</td>
<td>.02</td>
<td>44( 3)</td>
<td>71( 5)</td>
<td>111( 7)</td>
<td>149( 9)</td>
</tr>
<tr>
<td>E.N.T.</td>
<td>.10</td>
<td>220(14)</td>
<td>354(24)</td>
<td>556(36)</td>
<td>744(48)</td>
</tr>
<tr>
<td>Diagnostic radiology</td>
<td>.30</td>
<td>660( 43)</td>
<td>1060( 69)</td>
<td>1670(108)</td>
<td>2240(241)</td>
</tr>
<tr>
<td>Laboratory</td>
<td>.50</td>
<td>1100( 71)</td>
<td>1770(115)</td>
<td>2780(180)</td>
<td>3720(241)</td>
</tr>
<tr>
<td>Minor surgery</td>
<td>.10</td>
<td>220(14)</td>
<td>354(24)</td>
<td>556(36)</td>
<td>744(48)</td>
</tr>
<tr>
<td>Physical therapy</td>
<td>.15</td>
<td>330(21)</td>
<td>532(35)</td>
<td>834(54)</td>
<td>1120(72)</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>.20</td>
<td>440( 28)</td>
<td>710( 46)</td>
<td>1110( 72)</td>
<td>1490( 90)</td>
</tr>
</tbody>
</table>
7.1.9 The range of average to maximum number of outpatients making contact at given points at one time is derived by dividing both the average and the maximum 3-hour outpatient contacts by the respective patient process times. This calculation assumes a constant patient flow for the 3-hour period, but the top end of the range (maximum figure) would allow for fluctuations on a normal day. For any given 3-hour period the low end of the range (average figure) should be adequate 50% of the time; the top end 100% of the time. For these reasons it would be reasonable to plan toward the maximum figure for contacts. This table is based on a 9-hour, 5-day outpatient flow.

<table>
<thead>
<tr>
<th>Contact area</th>
<th>Processing time in minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission</td>
<td>5</td>
</tr>
<tr>
<td>Exam-techniques</td>
<td>20</td>
</tr>
<tr>
<td>E.K.G.</td>
<td>30</td>
</tr>
<tr>
<td>Inhalation therapy</td>
<td>30</td>
</tr>
<tr>
<td>Dental</td>
<td>20</td>
</tr>
<tr>
<td>Social worker</td>
<td>30</td>
</tr>
<tr>
<td>Psychiatrist</td>
<td>60</td>
</tr>
<tr>
<td>E.E.N.T.</td>
<td>20</td>
</tr>
<tr>
<td>Diagnostic radiology</td>
<td>20</td>
</tr>
<tr>
<td>Laboratory</td>
<td></td>
</tr>
<tr>
<td>Minor surgery</td>
<td>30</td>
</tr>
<tr>
<td>Physical therapy</td>
<td>30</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>5</td>
</tr>
</tbody>
</table>
7.1.10 Square footage for the major areas may now be made, based upon the range of patients making contacts and the number of square feet required per patient per function. The areas will be given in approximate net square footage.

<table>
<thead>
<tr>
<th>Major area</th>
<th>Planning persons</th>
<th>Sq. ft.</th>
<th>Planning person</th>
<th>Net sq. ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission</td>
<td>8.0</td>
<td>75</td>
<td></td>
<td>600</td>
</tr>
<tr>
<td>Exam-techniques</td>
<td>20.0</td>
<td>250</td>
<td></td>
<td>5000</td>
</tr>
<tr>
<td>Consultation</td>
<td>10.0</td>
<td>250</td>
<td></td>
<td>2500</td>
</tr>
<tr>
<td>E.K.G.</td>
<td>3.0</td>
<td>250</td>
<td></td>
<td>750</td>
</tr>
<tr>
<td>Inhalation therapy</td>
<td>3.0</td>
<td>250</td>
<td></td>
<td>750</td>
</tr>
<tr>
<td>Dental</td>
<td>10.0</td>
<td>250</td>
<td></td>
<td>2500</td>
</tr>
<tr>
<td>Social worker</td>
<td>2.0</td>
<td>250</td>
<td></td>
<td>500</td>
</tr>
<tr>
<td>Psychiatrist</td>
<td>2.0</td>
<td>250</td>
<td></td>
<td>500</td>
</tr>
<tr>
<td>E.E.N.T.</td>
<td>4.0</td>
<td>250</td>
<td></td>
<td>1000</td>
</tr>
<tr>
<td>Diagnostic radiology</td>
<td>10.0</td>
<td>250</td>
<td></td>
<td>2500</td>
</tr>
<tr>
<td>Laboratory</td>
<td></td>
<td></td>
<td></td>
<td>2000</td>
</tr>
<tr>
<td>Minor surgery</td>
<td>6.0</td>
<td>500</td>
<td></td>
<td>3000</td>
</tr>
<tr>
<td>Physical therapy</td>
<td>8.0</td>
<td>125</td>
<td></td>
<td>1000</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>2.0</td>
<td>500</td>
<td></td>
<td>1000</td>
</tr>
<tr>
<td>Administrative</td>
<td></td>
<td></td>
<td></td>
<td>6000</td>
</tr>
<tr>
<td>Mobile units</td>
<td></td>
<td></td>
<td></td>
<td>1000</td>
</tr>
</tbody>
</table>
7.2 Functions
Functions are groups of related activities contributing to the effectiveness of the health care facility. These functions may be classified basically as administrative, clinical or medical, rehabilitative, and supportive.
7.2.1 Administrative functions
These functions contribute to the management of the health care facility; that is, they are concerned with the planning, organizing, staffing, directing, and controlling of the facility. They are dynamic, based on the interaction of people with people, or people with technology. They are the most general of the functions; administrative functions penetrate every activity of a health facility.
Administration

Function:
The administrative area serves as the source of management of the health facility, where concern for the planning, organizing, staffing, directing, and controlling take place.

Major spaces:
Business manager: 1@ 150
Secretary: 1@ 100
Administrator: 1@ 150
Secretary: 1@ 100
Medical director: 1@ 150
Secretary: 1@ 100
Dental director: 1@ 150
Secretary: 1@ 100
Nurse supervisor: 1@ 150
Accountant: 1@ 150
Bookkeepers: 4@ 100
Typists: 4@ 100
Mailroom: 1@ 100
Conference: 1@ 400
Workroom-storage: 1@ 200
Waiting: 1@ 150

2950 Net Square Feet
7.2.2 Medical or clinical functions
These are the many varied services performed by medical and paramedical personnel in an attempt to establish and uphold total health care.
Examination - Treatment

Functions:
The general medical services which compose the basis for group practice are within this area. They provide for the examination, consultation, and treatment of the patient.

Major spaces:
Exam-treatment
- General 32@ 125 4000
- Dental 16@ 125 2000
- Social 4@ 150 600
- Conference-office 24@ 125 3000
- Audio 4@ 150 600
- E.E.N.T. 4@ 150 600

Nurses stations
Clean utilities
Soiled utilities
Medicine storage 2000
Medical apparatus
Sub-Lab. collection points

12,800 Net Sq. Ft.
Laboratory

Function:
The laboratory is a place equipped for analytical or experimental work. It is responsible for the collection of samples and specimens, then processing, testing and analysis of these samples.

Major spaces:
Examination and testing  1@ 1150  1150
Control-waiting  1@ 150  150
Pathology office  1@ 100  100
Glass washing-sterilizing  1@ 400  400
Technicians lockers  2@ 50  100
Storage  1@ 200  200

2100 Net sq. ft.
Radiology

Function:
Radiology is a service facility. It is used in diagnosing, treating, and researching diseases by the use of radioactive materials.

Major spaces:

<table>
<thead>
<tr>
<th>Space</th>
<th>Quantity</th>
<th>Size</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiographic rooms</td>
<td>4</td>
<td>250</td>
<td>1000</td>
</tr>
<tr>
<td>Control Booths</td>
<td>2</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>Dressing</td>
<td>4</td>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>Processing-darkroom</td>
<td>1</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Viewing room</td>
<td>1</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Filing storage</td>
<td>1</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Technicians lockers</td>
<td>2</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Control-waiting</td>
<td>1</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

1900 Net sq. ft.
Surgery

Functions:
Surgery is a branch of medicine dealing with manual and operative procedures for correction of deformities and defects, repair of injuries, diagnosis and cure of diseases, relief of suffering and prolongation of life. The surgical suite should incorporate diagnosis, pre-operative, operative, and surgical recovery in one unit.

<table>
<thead>
<tr>
<th>Major spaces</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating rooms</td>
<td>4@ 400</td>
<td>1600</td>
</tr>
<tr>
<td>Clean-up room</td>
<td>2@ 50</td>
<td>100</td>
</tr>
<tr>
<td>Anesthesia equipment storage</td>
<td>2@ 50</td>
<td>100</td>
</tr>
<tr>
<td>Surgical supervisors office</td>
<td>1@ 50</td>
<td>50</td>
</tr>
<tr>
<td>Sterile storage</td>
<td>2@ 50</td>
<td>100</td>
</tr>
<tr>
<td>Doctors lockers</td>
<td>1@ 50</td>
<td>50</td>
</tr>
<tr>
<td>Nurses lockers</td>
<td>1@ 50</td>
<td>50</td>
</tr>
<tr>
<td>Stretcher storage</td>
<td>1@ 100</td>
<td>100</td>
</tr>
<tr>
<td>Recovery</td>
<td>1@ 800</td>
<td>800</td>
</tr>
<tr>
<td>Scrub-up alcove</td>
<td>2@ 50</td>
<td>100</td>
</tr>
<tr>
<td>Surgical corridor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utility and storage</td>
<td>1@ 200</td>
<td>200</td>
</tr>
</tbody>
</table>

3250 Net sq. ft.
7.2.3 Rehabilitative functions
These functions are provided for restoration of the ill or disabled to the fullest degree of physical, mental, social, and economic usefulness of which he is capable and maintain that level.
Rehabilitation

Function:
Rehabilitation consists of diagnosis, evaluation, preventive and restorative treatment, education, training and placement. This facility will be limited in scope and therefore will be providing only physical therapy, social service, and inhalation therapy.

Major spaces:
Activity room 1@ 600 600
Control-waiting 1@ 200 200
Dressing-lockers 2@ 50 100
Equipment storage 1@ 200 200

1100 Net sq. ft.
7.2.4 Supportive functions
These functions lend support to the administrative and medical functions of the facility, but are not themselves administrative or medical. They supply the materials, services, and information necessary for the full utilization of the facility.
Pharmacy

Function:
Pharmacy is the practice of compounding and dispensing medical preparations. This will be the area assigned to retail sales of drugs and medications, and eye glasses.

<table>
<thead>
<tr>
<th>Major spaces</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compounding and dispensing lab</td>
<td>400</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waiting</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye glass display</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fitting booths</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workroom-storage</td>
<td>200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1100 Net sq. ft.
Central service

Functions:
Central service is the centralization and control of preparation and distribution of supplies used throughout the health facility. Supplies are stored in a central area and are checked out as they are requisitioned by a department; returned usable supplies are checked in, processed, and returned to storage. Inventory is kept up-to-date. An efficient central service is necessary for the smooth functioning of a health facility; and, as disposables are used more, it will become more necessary.

Major spaces:
Clean work and sterilizing  1@ 200  200
Equipment storage  1@ 200  200
Receiving clean-up  1@ 100  100
Sterile and unsterile supply storage  2@ 50  100
Office  1@ 50  50

650 Net sq. ft.
Central storage

Function:
The central storage area is for the storage of bulk and quantity supplies and equipment, and the inactive records. These are items not needed for immediate use. Central storage works closely with central service. It also includes a dock receiving area.

Major spaces:
- General storage: 1@ 400, 400
- Receiving: 1@ 200, 200
- Office: 1@ 50, 50

650 Net sq. ft.
Maintenance

Function:
Maintenance is the long-term care of the physical plant. It includes preventive and routine care as well as repair work. The objective is to prevent defects or to restore defects before complete failure or loss of function occurs. Maintenance has ultimate control of the planning of physical and mechanical sub-systems. It maintains the physical hardware of heating, lighting, power, water, communications, electrical, grounds, and pipelines such as water, oxygen, compressed air, and medical gasses. It also maintains the physical condition of interior and exterior shells.

Major spaces:
Shop area  1@ 400  400
Office  1@ 50  50

450 Net sq. ft.
Library

Function:
The library handles retention, cataloging, handling, storage, and dissemination of books, pamphlets, periodicals, and such materials. Medical literature is maintained to fill the needs of the health facility and medical staff with emphasis on supplying information relative to the clinical or medical services offered.

Major spaces:
Book storage 1@ 400 400

400 Net sq. ft.
Admissions and discharging

Functions:
The primary functions of admitting include the process of admitting patients, responsibility for patient information and services availability for patients prior to being sent to service areas, guiding of these patients to required stations, processing of out-patients, and central scheduling of patients. Secondary functions include visitor information and control and communications.

<table>
<thead>
<tr>
<th>Major spaces</th>
<th>1a</th>
<th>400</th>
<th>400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission</td>
<td>1a</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Waiting</td>
<td>1a</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Information</td>
<td>1a</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Registration</td>
<td>1a</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Cashier</td>
<td>1a</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Medical records</td>
<td>1a</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Business Records</td>
<td>1a</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Children's playroom</td>
<td>1a</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

2350 Net sq. ft.
Housekeeping

Function:
Housekeeping is the maintenance of clean and sanitary conditions in the health facility. It is coordinated with every department and must receive the cooperation of every department. To be effective, housekeeping is done in a routine designed to prevent accumulation of trash. Housekeeping is responsible for trash disposal and partially for vector and infection control.

Major spaces:
Maintenance closets  4@ 50  200

200 Net sq. ft.
Lounes

Function:
Provide an area in which doctors, nurses, technicians, staff, patients, and visitors might relax and enjoy refreshments and conversation. Toilet facilities for both men and women must be provided also.

Major spaces:
Lounge for staff, technicians,
Nurses, and doctor
Men lounge 1@ 250 250
Womens lounge 1@ 250 250
Lounge for patients and visitors 1@ 500 500

1000 Net sq. ft.
Mechanical

Functions:
The mechanical area must provide space for the location of heating, ventilating, and air conditioning, which serve to regulate the climate within the building.

Major spaces:  
Mechanical room  1@ 1000  1000
Chase space

1000 Net sq. ft.
### Spatial summary

<table>
<thead>
<tr>
<th>Function</th>
<th>Net sq. ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Administrative function</strong></td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td>2,950</td>
</tr>
<tr>
<td><strong>Medical or clinical function</strong></td>
<td></td>
</tr>
<tr>
<td>Examination - treatment</td>
<td>12,800</td>
</tr>
<tr>
<td>Laboratory</td>
<td>2,100</td>
</tr>
<tr>
<td>Radiology</td>
<td>1,900</td>
</tr>
<tr>
<td>Surgery</td>
<td>3,250</td>
</tr>
<tr>
<td><strong>Rehabilitative function</strong></td>
<td></td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>1,100</td>
</tr>
<tr>
<td><strong>Supportive function</strong></td>
<td></td>
</tr>
<tr>
<td>Pharmacy</td>
<td>1,100</td>
</tr>
<tr>
<td>Central service</td>
<td>650</td>
</tr>
<tr>
<td>Central stores</td>
<td>650</td>
</tr>
<tr>
<td>Maintenance</td>
<td>450</td>
</tr>
<tr>
<td>Library</td>
<td>400</td>
</tr>
<tr>
<td>Admissions</td>
<td>2,350</td>
</tr>
<tr>
<td>Housekeeping</td>
<td>200</td>
</tr>
<tr>
<td>Lounges</td>
<td>1,000</td>
</tr>
<tr>
<td>Mechanical</td>
<td>1,000</td>
</tr>
</tbody>
</table>

31,900 Net sq. ft  
31,900 x 1.3  
(circulation)  
41,470 Gross sq. ft.
8.0 ALTERNATIVES

Different options avail themselves as we measure the advantages and disadvantages of a particular solution versus the advantages and disadvantages of another potential solution. Through consideration of factors such as flexibility, potential for expansion, location to related units, accessibility, services rendered, economics in terms of both initial costs and maintenance costs for operation, disruption to existing facilities due to construction, adequate or inadequate square footage, functional relationships, flow patterns, and acceptance factors both political and social, we can rationally choose the appropriate solution or solutions.

8.1 One option is to make no improvements in the health care system or existing facilities.

8.2 One option is to modernize existing facilities.

8.3 One option is to construct an addition or additions to existing facilities.

8.4 One option is to both modernize and construct an addition to existing facilities.

8.5 One option is to begin new construction for additional health care units.
   8.5.1 A sub-option is to provide a central unit only.
   8.5.2 A sub-option is to provide a central unit and satellites.
   8.5.3 A sub-option is to provide a central unit and mobile units.
   8.5.4 A sub-option is to provide a number of identical units.
FLOOR PLAN
FLOOR PLAN