TEXAS A & M UNIVERSITY
RIVERSIDE CAMPUS
MASTER PLAN

JUNE 1988
BOVAY ENGINEERS, INC.
SMITH LOCKE ASAKURA INC.
THE HARDIN GROUP
ROScoe H. JONES CONSULTANT
TEXAS A & M UNIVERSITY
RIVERSIDE CAMPUS

MASTER PLAN

PROJECT NO. 1-2597

JUNE 1988

BOVAY ENGINEERS, INC.
SMITH LOCKE ASAKURA INC.
THE HARDIN GROUP
ROScoe H. JONES CONSULTANT
BOARD OF REGENTS
THE TEXAS A&M UNIVERSITY SYSTEM

Mr. David G. Eller                       Chairman
Mr. Joe H. Reynolds                     Vice Chairman
Dr. John B. Coleman                     Member
Mr. Douglas R. DeCluitt                 Member
Mr. L. Lowry Mays                       Member
Mr. William A. McKenzie                 Member
Mr. John Mobley                         Member
Mr. Wayne Showers                       Member
Mr. Royce E. Wisenbaker                 Member

Dr. Perry L. Adkisson                   Chancellor, The Texas A&M University System
Dr. Frank E. Vandiver                   President, Texas A&M University
General Wesley E. Peel                  Vice Chancellor for Facilities Planning and Construction, The Texas A&M University System
Mr. Paul W. Stephens                    Manager, Facilities Planning Division, The Texas A&M University System
ACKNOWLEDGMENT

The continued growth of the Texas A&M University System and Texas A&M University created a need for the master planning of Riverside Campus formerly identified as the Bryan Research and Extension Center (BREC).

The Riverside Campus Master Plan was authorized by the Board of Regents of the Texas A&M University System in August, 1987. The Master Plan was developed by a consultant team led by Bovay Engineers, Inc. and included Smith Locke Asakura, Inc; The Hardin Group; and Roscoe H. Jones Consultant.

Project guidance was provided through the coordination of a Steering Committee appointed to assist in the campus planning process and the staff of the Facilities Planning Division, The Texas A&M University System. Steering Committee membership included the following:

Jerry Gaston  
Dr. William H. Mobley  
Dr. Robert J. Merrifield  
Dr. John E. Flipse  
Dr. G. Sadler Bridges  
Mr. Robert Smith  
Dr. John J. Dinkel  

Mr. Jim Stocker  

Chairman  
Member  
Member  
Member  
Member  
Member  

Administrative Support
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>SECTION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td></td>
</tr>
<tr>
<td>Purpose of Study</td>
<td>1</td>
</tr>
<tr>
<td>Background</td>
<td>2</td>
</tr>
<tr>
<td><strong>GOALS AND OBJECTIVES</strong></td>
<td></td>
</tr>
<tr>
<td>Questionnaires and Interviews</td>
<td>3</td>
</tr>
<tr>
<td>Goals and Objectives</td>
<td>8</td>
</tr>
<tr>
<td><strong>ANALYSIS OF PLANNING FACTORS</strong></td>
<td></td>
</tr>
<tr>
<td>Regional Setting</td>
<td>13</td>
</tr>
<tr>
<td>Natural Factors</td>
<td>13</td>
</tr>
<tr>
<td>Land Use</td>
<td>21</td>
</tr>
<tr>
<td>Buildings</td>
<td>23</td>
</tr>
<tr>
<td>Traffic Circulation</td>
<td>23</td>
</tr>
<tr>
<td>Parking</td>
<td>26</td>
</tr>
<tr>
<td>Existing Utilities</td>
<td>26</td>
</tr>
<tr>
<td>Security and Safety</td>
<td>33</td>
</tr>
<tr>
<td>Image and Aesthetics</td>
<td>34</td>
</tr>
<tr>
<td><strong>ALTERNATIVE CONCEPT PLANS</strong></td>
<td></td>
</tr>
<tr>
<td>Scheme One - Grid Concept</td>
<td>40</td>
</tr>
<tr>
<td>Scheme Two - Loop Concept</td>
<td>41</td>
</tr>
<tr>
<td>Scheme Three - Curvilinear Concept</td>
<td>42</td>
</tr>
<tr>
<td>Evaluation of Alternative Concepts</td>
<td>42</td>
</tr>
<tr>
<td><strong>MASTER PLAN</strong></td>
<td></td>
</tr>
<tr>
<td>Campus Master Plan Concepts</td>
<td>45</td>
</tr>
<tr>
<td>Master Plan Elements</td>
<td>46</td>
</tr>
<tr>
<td>Traffic Circulation Plan</td>
<td>56</td>
</tr>
<tr>
<td>Open Space Plan</td>
<td>60</td>
</tr>
<tr>
<td>Facility Plan</td>
<td>60</td>
</tr>
<tr>
<td>Campus Image and Identity</td>
<td>66</td>
</tr>
<tr>
<td>Utilities and Drainage Plan</td>
<td>69</td>
</tr>
<tr>
<td>Fire Protection Plan</td>
<td>84</td>
</tr>
<tr>
<td>Security and Fencing Plan</td>
<td>85</td>
</tr>
<tr>
<td><strong>IMPLEMENTATION PLAN</strong></td>
<td></td>
</tr>
<tr>
<td>Phasing Plan</td>
<td>86</td>
</tr>
<tr>
<td>Capital Improvements Program</td>
<td>88</td>
</tr>
<tr>
<td>Management Plan</td>
<td>96</td>
</tr>
<tr>
<td>Development Regulations</td>
<td>99</td>
</tr>
</tbody>
</table>
# LIST OF EXHIBITS AND TABLES

<table>
<thead>
<tr>
<th>Exhibit</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regional Setting</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Terrain Analysis</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>Soils Analysis</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>Vegetation Analysis</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>Existing Land Use Inventory</td>
<td>22</td>
</tr>
<tr>
<td>6</td>
<td>Existing Building Evaluation</td>
<td>24</td>
</tr>
<tr>
<td>7</td>
<td>Existing Streets and Parking</td>
<td>25</td>
</tr>
<tr>
<td>8</td>
<td>Water</td>
<td>28</td>
</tr>
<tr>
<td>9</td>
<td>Sanitary Sewer</td>
<td>29</td>
</tr>
<tr>
<td>10</td>
<td>Gas</td>
<td>31</td>
</tr>
<tr>
<td>11</td>
<td>Power Distribution/Communication</td>
<td>32</td>
</tr>
<tr>
<td>12</td>
<td>Scheme 1</td>
<td>37</td>
</tr>
<tr>
<td>13</td>
<td>Scheme 2</td>
<td>38</td>
</tr>
<tr>
<td>14</td>
<td>Scheme 3</td>
<td>39</td>
</tr>
<tr>
<td>15</td>
<td>Illustrative Master Plan</td>
<td>47</td>
</tr>
<tr>
<td>16</td>
<td>Land Use Plan</td>
<td>48</td>
</tr>
<tr>
<td>17</td>
<td>Campus Entry</td>
<td>49</td>
</tr>
<tr>
<td>18</td>
<td>Technology Core</td>
<td>51</td>
</tr>
<tr>
<td>19</td>
<td>Traffic Circulation Plan</td>
<td>57</td>
</tr>
<tr>
<td>20</td>
<td>Typical Road Sections</td>
<td>59</td>
</tr>
<tr>
<td>21</td>
<td>Open Space Plan</td>
<td>61</td>
</tr>
<tr>
<td>22</td>
<td>Proposed Demolition Plan</td>
<td>65</td>
</tr>
<tr>
<td>23</td>
<td>Entry Perspective</td>
<td>68</td>
</tr>
<tr>
<td>24</td>
<td>Signing &amp; Fencing Plan</td>
<td>70</td>
</tr>
<tr>
<td>25</td>
<td>Proposed Water Distribution</td>
<td>72</td>
</tr>
<tr>
<td>26</td>
<td>Proposed Wastewater Plan</td>
<td>75</td>
</tr>
<tr>
<td>27</td>
<td>Proposed Storm Drainage Plan</td>
<td>77</td>
</tr>
<tr>
<td>28</td>
<td>Proposed Gas Distribution Plan</td>
<td>79</td>
</tr>
<tr>
<td>29</td>
<td>Proposed Electrical, Lighting, Communications System</td>
<td>81</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tables</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Current Users of Space at the Riverside Campus</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Floor Space - Present and Projected</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Support Facilities</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Summary Evaluation of Alternate Concept Plans</td>
<td>44</td>
</tr>
<tr>
<td>5</td>
<td>Technology Core Area Parking &amp; Capacity</td>
<td>60</td>
</tr>
<tr>
<td>6</td>
<td>Recommended Lighting Standards</td>
<td>83</td>
</tr>
<tr>
<td>7</td>
<td>Building Phasing Plan</td>
<td>87</td>
</tr>
<tr>
<td>8</td>
<td>Capital Improvements Program</td>
<td>90</td>
</tr>
<tr>
<td>9</td>
<td>Ultimate Development Level</td>
<td>95</td>
</tr>
</tbody>
</table>
INTRODUCTION

This report presents a Master Plan for Riverside Campus of Texas A&M University and includes the following major sections: Introduction, Goals and Objectives, Analysis of Planning Factors, Alternative Concept Plans, Master Plan and Implementation Plan.

The former Bryan Air Force Base site has been known as the Texas A&M University Research and Extension Center at Bryan, the Bryan Research and Extension Center (BREC), the Texas A&M University Research Annex, and the Annex. These names tend to present a negative image which is not in keeping with the master planned facility of the future. To avoid these negative images the new name selected by the Texas A&M University Board of Regents - Texas A&M University Riverside Campus is used in this report.

The Introduction of this report briefly relates the purpose of the study and presents an overview of the facility, past and present.

The next section, Goals and Objectives, summarizes the results of questionnaires and follow-up interviews of over 30 key officials and college and departmental representatives selected by the steering committee appointed to oversee the preparation of the Master Plan. These questionnaires and interview results, along with review sessions with the steering committee, formed the basis for the suggested Goals and Objectives.

The Analysis of Planning Factors section summarizes and analyzes the collected data forming the basis for the preparation of the Alternative Concept Plans that are presented in this report.

The section, Alternative Concept Plans, offers three concept plans, Grid, Loop and Curvilinear, and summarizes the evaluation of these Alternative Concept Plans.

The Master Plan section provides detailed discussions of the many elements of the Master Plan and the functional plans, such as traffic circulation and utilities, which are part of the Master Plan for Riverside Campus.

The final section, Implementation Plan includes the Phasing Plan, the Capital Improvements Program, Management Plan and Development Regulations.

PURPOSE OF STUDY

For approximately 25 years the former Bryan Air Force Base has served Texas A&M University as a location for research and extension activities which just could not have been carried out on the Texas A&M University Main Campus. Plenty of space, both indoors and outdoors, has been available at low cost. Several thousands of technicians and professionals have been trained at the site, endless experiments have been conducted at the site, and invaluable items have been stored at the site. However, the former Air Force Base is burdened with an image problem, a seemingly remote location and an unattractive appearance. The "Annex" is a place where few go, and then only out of necessity.
The future should be different. The site is no longer subject to restrictive reversionary requirements of the federal government and a recent change in the Texas Constitution has authorized money from the available university fund to be used at the site. In addition, a new University Parkway is planned to shorten travel time between the Main Campus and the Riverside Campus. These changes have made it most timely to master plan the site to guide the renewal and future development. It is the purpose of this study to develop a Master Plan and Implementation Plan which will serve as a guide to the transformation of the Research and Extension Center at Bryan from an "ugly duckling" to an aesthetically pleasing, efficient and cost effective campus extension of the Texas A&M University, which will be fully accepted.

BACKGROUND

Master planning for the future of the Riverside Campus builds upon the past and present conditions of the facility. This section provides a brief overview of the facility historically as well as its present condition.

The Bryan Air Force Base was activated during World War II to provide pilot training. After three years of service, the facility was deactivated in 1946 and then used by Texas A&M College to house freshmen attending Texas A&M during the late 1940's. The Air Force reactivated the base during the Korean Conflict and built two 7,000' runways and some permanent brick barracks buildings. The Air Force deactivated the base in 1958. Declared surplus, the property was turned over to the Federal General Service Administration who, in 1962, leased the property to Texas A&M subject to the facility being used for educational or research purposes. The lease provided for reclamation of the site by the federal government in the event of a national emergency during the period of 1962-1982. In 1982, Texas A&M University acquired title to the property.

The facility includes some 1,991 acres of relatively flat rangeland adjacent to State Highway 21, seven miles west of the Main Campus. More than 90 buildings remain on the site with about two-thirds of them considered to be in very poor condition and appearance. The original street system remains intact along with the runway systems and apron area. Today the property has the appearance of an abandoned air base. The property definitely falls short of its potential as one of the campuses of Texas A&M University.
GOALS AND OBJECTIVES

The goals and objectives set forth herein form the basis for the Site Master Plan. In formulating these goals and objectives the input from System and University Departments and Faculty has been invaluable. Over 30 questionnaires were sent to various officials and staff selected by the Steering Committee and interviews were conducted with these officials to assist in the formulation of goals and objectives for the development of the Riverside Campus. The goals and objectives set forth in this section do reflect the desires of the System and the University.

The first part of this section contains a synopsis of the results of the questionnaires and the interviews. The second part presents the goals and objectives.

QUESTIONNAIRES AND INTERVIEWS

The questionnaires were designed to yield information about the current and future activities of the colleges, agencies and other organizations at the Riverside Campus. Space was provided for listing special needs, support services and facilities suitable for the Riverside Campus, and suggested goals to be achieved in the future of the Riverside Campus. Interviews were conducted with the respondents to clarify and expand on the information provided in the questionnaire. The following summarizes the data obtained.

Current Activities

The current activities at the Riverside Campus are summarized in Table I: Current Users of Space at the Riverside Campus. The eleven users listed in the table occupy 362,648 square feet of building space. The top five users are Texas Engineering Experiment Station, Texas Agriculture Experiment Station, Texas Engineering Extension Service, Texas Transportation Institute, and the College of Geoscience. These users occupy 82.3% of the floor space being used. This total does not include the Physical Plant service buildings and some of the storage buildings. The Innovare Report prepared by Dr. Lane Marshall and graduate students in the Department of Landscape Architecture, listed a total of 394,955 square feet of buildings at the Riverside Campus in 1985. At the present time, almost all of this available floor space is being utilized. In addition, virtually all of the open land space is utilized by various departments, college and agencies. According to the data from the questionnaires, there are currently 141 persons employed at the Riverside site and over 145 students in attendance during any given week. Most of these students are attending Texas Engineering Extension Service training programs.

Future Activities

As the present users view the future of the Riverside Campus, few see any expansion of their uses. Five of the users left the future blank or projected no change. Four gave indication of slight increases for 1995 or 2000, but left a lot of blanks. Only two users gave full projections for all of the
future target years. Two users who projected relatively large needs were the U.S.D.A. and the Texas Transportation Institute. In the discussions during the interviews, it was pointed out by those being interviewed that it was extremely difficult to forecast future needs for space.

Table 1: Current Users of Space at the Riverside Campus

<table>
<thead>
<tr>
<th>AGENCY</th>
<th>FLOOR SPACE</th>
<th>%</th>
<th>Cum. %</th>
<th>LAND AREA</th>
<th>EMPLOYEES</th>
<th>STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sq. Ft.</td>
<td></td>
<td></td>
<td>Acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEES</td>
<td>95,845</td>
<td>26.4</td>
<td>26.4</td>
<td>-----</td>
<td>25</td>
<td>5</td>
</tr>
<tr>
<td>TAES</td>
<td>54,661</td>
<td>15.1</td>
<td>41.5</td>
<td>662</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>TEEE</td>
<td>54,000</td>
<td>14.9</td>
<td>56.4</td>
<td>125</td>
<td>26</td>
<td>125</td>
</tr>
<tr>
<td>TTI</td>
<td>50,000</td>
<td>13.8</td>
<td>70.2</td>
<td>1,000</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>GSC</td>
<td>44,000</td>
<td>12.1</td>
<td>82.3</td>
<td>70</td>
<td>2</td>
<td>MANY</td>
</tr>
<tr>
<td>SC</td>
<td>25,000</td>
<td>6.9</td>
<td>89.2</td>
<td>--</td>
<td>30</td>
<td>--</td>
</tr>
<tr>
<td>TAEX</td>
<td>21,000</td>
<td>5.8</td>
<td>85.0</td>
<td>1</td>
<td>40</td>
<td>4</td>
</tr>
<tr>
<td>OPP</td>
<td>7,055</td>
<td>1.9</td>
<td>96.9</td>
<td>5</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>VET MED</td>
<td>5,000</td>
<td>1.4</td>
<td>98.3</td>
<td>650</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>LIB</td>
<td>4,467</td>
<td>1.2</td>
<td>99.5</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>MED</td>
<td>1,620</td>
<td>0.4</td>
<td>99.9</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>TOTALS</td>
<td>362,648</td>
<td>99.9</td>
<td></td>
<td>2,443</td>
<td>141</td>
<td>145</td>
</tr>
</tbody>
</table>

Sources: Questionnaires and Interviews

Notes:

Physical Plant usage not included. Actual land area totals 1,991 acres; the total shown above is greater due to overlapping uses.

Abbreviations are as follows:

Texas Engineering Experiment Station, Texas Agriculture Experiment Station, Texas Engineering Extension Service, Texas Transportation Institute, College of Geoscience, College of Science, Texas Agriculture Extension Service, Offshore Drilling Program, College of Veterinary Medicine, Library, College of Medicine.

There is a major potential for the expansion of research activities at the Riverside Campus. Dr. Anderson of Graduate Studies indicated that a goal of the University is to double the amount of research in the next ten to 15 years. Based on this goal, it is likely that such activities will also significantly increase at the Riverside Campus. TAMU research currently ranks eleventh in the United States with a funding level of about $165 million dollars, with the number one having a 1985 funding level of about $400 million dollars. It is not unreasonable to envision that TAMU will achieve their goal of becoming number five with an annual funding level of $300 million dollars within a decade. This is a $135 million dollar increase in research funds which indicates that over a million square feet in new research office and laboratory space will be needed for TAMU in the coming decade. If a third of
this new space were provided at the Riverside Campus, it would mean a doubling of floor space at the Riverside Campus by the year 2000. Data from the two users who did provide forecasts of space needs at the Riverside Campus for the three target years of 1995, 2000, and 2010, appear to be in line with such forecasts. The two users occupied 75,000 square feet of floor space at the Riverside Campus in 1987 and projected 115,000 for 1995, 155,000 for 2000, and 200,000 for 2010.

While research activities are extensive at the Riverside Campus, so are extension services, both agriculture and engineering. Since future growth of the State of Texas is going to emphasize diversification of the economy, especially in technological activities, there will be an expanding need for training and retraining of technicians and professionals throughout the state. Just as for research, the estimation of future building and land needs for extension services is most difficult. From the results of the questionnaires and interviews, the space requirements for extension services could double in the next ten to fifteen years.

For master planning purposes, the following estimates of future space needs at the Riverside Campus are felt to be reasonable based on the preceding discussion.

<table>
<thead>
<tr>
<th>Year</th>
<th>Floor Space sq. ft.</th>
<th>Employees</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present Usage</td>
<td>613,000</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>1995</td>
<td>800,000</td>
<td>300</td>
<td>250</td>
</tr>
<tr>
<td>2000</td>
<td>1,100,000</td>
<td>900</td>
<td>400</td>
</tr>
<tr>
<td>2010</td>
<td>1,500,000</td>
<td>1,500</td>
<td>500</td>
</tr>
</tbody>
</table>

Source: Projections based on questionnaires and interviews.

These estimates should be considered flexible and subject to revision as new data becomes available. Because the future of research and extension services is so uncertain, the master plan should provide for a maximum of flexibility to accommodate unforeseen developments. In addition, the master plan should be frequently updated and certainly receive a careful review every five years.

Support Facilities and Services

The following table summarizes the replies to the question about what support facilities and services are needed at the Riverside Campus:
### Table 3 - Support Facilities

<table>
<thead>
<tr>
<th>Service</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus Service</td>
<td>11</td>
</tr>
<tr>
<td>Food Service</td>
<td>9</td>
</tr>
<tr>
<td>Mail Service</td>
<td>8</td>
</tr>
<tr>
<td>Jogging Trails</td>
<td>7</td>
</tr>
<tr>
<td>Bicycle Paths</td>
<td>5</td>
</tr>
<tr>
<td>Lodging</td>
<td>4</td>
</tr>
<tr>
<td>Super Computer</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: Questionnaires

Bus service ranks as the number one need followed closely by food and mail service and jogging trails. Other needs mentioned were security, swimming pool, various outdoor athletic courts, and playing fields.

Major Shortcomings - The major shortcomings of the Riverside Campus as viewed by those interviewed, may be grouped under four headings: 1. Access; 2. Funding; 3. Inadequate support facilities and services and; 4. Poor facilities.

These are discussed below.

- **Access**: By far the number one complaint was poor access. Comments made include: "too far", "remote location", "requires shuttle bus", "too remote", "inconvenient place to work", etc. One person felt that the site gave one a feeling of isolation while another suggested that it would take a monorail to fully link the site with the Main Campus.

- **Funding**: Some felt that the Riverside Campus competed with the Main Campus for resources. Others felt that long term funding commitments by TAMU would be required to transform the Riverside Campus into a desirable place in which to work and locate more activities.

- **Inadequate Support Facilities and Services**: Some pointed out the lack of food service, mail service, and security.

- **Poor facilities**: The unattractive physical appearance of the buildings and the grounds was pointed out by many. They also mentioned, "poor facilities" and "lack of elevators" in the multi-level buildings.

### Goals Suggested

The following goals were extracted from the questionnaires:

- Provide better access roads.
- Provide security, food service, mail service, elevators.
- Identify meaningful and feasible uses for the Riverside Campus.
Provide a market for the Riverside Campus to succeed.
Become a "true research center" with facilities, equipment, and laboratories.
Provide a complete "Life Science Research Center".
Provide a continuing commitment to develop the Riverside Campus.
Improve the recreational areas for the staff.
Develop a complete master plan and adequately fund it.
Replace unattractive structures with structures more befitting a major university.

Additional Comments

In addition to the information presented above, a number of interesting comments were made during the interviews as summarized below.

Of special interest were thoughts about future uses which might be appropriate to the Riverside Campus. First, it was felt that a Conference Center could well be placed at the Riverside Campus. The Conference Center could provide meeting rooms, lodging and food service for small faculty groups averaging 15 to 25 in size with a maximum of about 60. Such a facility might also be used as a small conference center serving a variety of groups. Second, much interest was expressed in developing a Recreational Area which would include the existing lake and swimming pool. In addition to generous and well landscaped open space, there could be volleyball courts, basketball courts, tennis courts, and baseball fields. Such a recreational area could also be used by student groups on weekends with indoor spaces for dances and parties, as well as meeting rooms for student group meetings.

The Riverside Campus might be a desirable location for the joint venture of the College of Environmental Design and TTI to locate a Roadside Vegetation Experiment/Demonstration Program, and also, a Historic Resource Center for the training of designers and crafts persons in full scale preservation of historic buildings.

The need for locker and shower facilities for the laboratory and field testing personnel was pointed out.

The Texas Accelerator Center currently located at HARC (Houston Area Research Center) could move to the Riverside Campus.

The establishment of a complete Life Science Research Center would draw a number of researchers to the Riverside Campus.

TAES and the College of Agriculture would like to place the Beef Cattle Center at the Riverside Campus on 600 acres west of the runways. Such a facility would require an access road from State Highway 21. To move all animal centers to the Riverside Campus, i.e., sheep, goats, beef, and swine, would possibly take more land than is available. Additional lands to the south and west of the present site could possibly be acquired for additional agricultural use.

Texas Engineering Extension Center could double its usage at the Riverside Campus within the next 10 to 15 years if upgraded facilities are provided.
While some feel that a "super-computer" is needed at the Riverside Campus to be a major magnet in drawing researchers to the site, others feel that the needs for a super computer are adequately met by the current linkages to Austin and HARC super computers. Supporters feel that having a super computer at TAMU would enable researchers to get print outs faster, offer better control of priorities of usage, and encourage greater use of super computers.

Physical education classes in skeet shooting, water skiing, and sailing are good prospects for the Riverside Campus. The old pistol range has been used by various groups such as Law Enforcement Training in the past and with improvements could be utilized by Military Science, Physical Education, Law Enforcement Training and others.

The Library could provide electronic index service to the Riverside Campus with overnight delivery of publications from the Main Campus Library. In the near future, CDRM (Compact Disk Reading Module) will be available for an increasing number of technical publications. Thus, an increasing number of technical articles could be available to users at the Riverside Campus via fiber phone links to the central facility. The Library has expressed a need for a 100,000 sq. ft. storage facility which could be placed at the Riverside Campus.

Military Science could use approximately 20 acres at the Riverside Campus for the mounted calvary unit and five to ten acres for a Leadership Reaction Center which would include a 60 foot repelling tower. The open spaces at the Riverside Campus are usable for various field training activities.

It is critical that the Ocean Drilling Program retain their location on the apron at building number 8031.

The new fiber link now being installed to be operational in August 1988 will make the Riverside Campus an integral part of the University telephone system. This initial installation will provide for expansion to 3,000 lines at the Riverside Campus.

A single control point for access to the apron and runways area is necessary.

GOALS AND OBJECTIVES

The following goals and objectives are based on the information gathered from the questionnaires and interviews and have been reviewed by the Steering Committee. These goals and objectives meet the wishes of the University. The seven goals broadly state the objectives to be achieved by the University with regard to the Riverside Campus. The seven goals cover the areas of 1. Relationships; 2. Accessibility; 3. Appearance; 4. Uses; 5. Support facilities and services; 6. Circulation; and 7. Management. Following the statement of each goal there is a brief discussion followed by specific objectives or specific projects and programs designed to help the University achieve the goals.
Goal 1. Relationships - The Riverside Campus should be developed as an integral part of Texas A&M University.

For approximately 25 years the "Annex" or "Research and Extension Center at Bryan" has been of important service. Despite this important need, it is viewed as a step-child of the University. Certainly, for many years the reversionary provisions under which the University could use the facilities caused the retention of many of the buildings and facilities of the old base.

With title to the old base now in the hands of the University, the time has come to develop a new image for the Riverside Campus and to begin its transformation to become in appearance, in function, and in acceptance, an integral part of the University. The following remaining goals and objectives and the Master Plan are designed to guide this transformation.

Objectives for Goal 1:
- Develop a Master Plan.
- Implement the Master Plan.

Goal 2. Accessibility - Make the Riverside Campus as close in travel time and distance to the University Main Campus as possible.

While the physical location of the Riverside Campus is fixed, much can be done to reduce the actual distance from the Main Campus to the Riverside Campus by building the planned University Parkway. Travel distance will be reduced from about 11 miles to about nine miles. A new entry from the new parkway will be provided which will reduce distance and provide an attractive, impressive entry to the Riverside Campus. With generous landscaping along the new parkway, the shortened travel time will be even more pleasant. As activities increase on the Riverside Campus, frequent shuttle bus service can facilitate travel between the Riverside Campus and Main Campus, West Campus, Research Park, and Easterwood Airport.

Objectives for Goal 2:
- Build the University Parkway.
- Provide frequent shuttle bus service to link the Riverside Campus with the Main Campus.

Goal 3. Appearance - The Riverside Campus should generally have the same level of amenities and appearance as the Main Campus consistent with usage.

Landscaping should be generously utilized to create an attractive campus, beginning with the entry way and continuing along the streets and through the open space, recreational and building areas. Landscaping can be used to screen the light industrial type uses and warehousing areas. In general, the new buildings at the Riverside Campus should have a permanent appearance. Some areas, such as along the apron, may utilize well designed, attractive metal buildings. Coordinated graphics will help to unify the buildings and facilities at the Riverside Campus and will also help integrate the Riverside
Campus with Main Campus. Achievement of the appearance goal for the Riverside Campus will require an increased level of maintenance and committed management.

Objectives for Goal 3:

- Provide landscaped amenities generally equal to the Main Campus consistent with usage.
- Provide design control for all new structures.
- Provide signing.

Goal 4. Uses - a. Uses on the Riverside Campus should be classified and grouped or zoned to reduce adverse impacts of one use upon another; b. Uses having extensive space needs should be located at the Riverside Campus; c. Uses engaging full time researchers and support staff with few direct connections to the academic activities on Main and West Campuses; and d. Uses involving hazardous activities should be located at the Riverside Campus.

In the past the Riverside Campus has provided generous outdoor and indoor space at low cost for experiments and extension services which would not have been feasible on Main Campus or West Campus. As traffic congestion worsens at Main Campus and as the Riverside Campus is improved, there will be an increasing number of agencies and research units wanting to relocate to the Riverside Campus. Continued planning and management can assure that the Riverside Campus remains attractive for the traditional uses, as well as newer uses wanting a location in a campus environment with the image, amenities and support facilities and services which a major university campus provides.

Similar uses are grouped as follows:

- **Open Land Uses** - Includes pasture uses by Veterinary Medicine and Agriculture. Properly landscaped and maintained these uses would add to the amenities of the Riverside Campus. These uses do have extensive land requirements. While there may be land for the 600 acre Beef Cattle Center, there is probably not enough unused land to include the sheep, goat, beef, and swine centers.

- **Runway and Apron Uses** - Texas Transportation Institute and other activities which must be located near the apron and runway areas.

- **Light Industrial Type Uses** - This would include the warehouses and metal buildings now located near the apron uses. These uses are primarily extension service activities. These should be screened from the technology uses and the recreational areas.

- **Technology Uses** - The technology uses would include research and administrative offices, laboratories, conference rooms and support facilities and services typically found within the academic core of a university campus.
Recreational Uses - Recreational uses would include sports fields, a swimming pool with bath house facilities, picnic facilities and a pavilion for student gatherings and parties. A Conference Center, designed for groups of 15 to 60 with lodging and food service (which may be catered from central facilities) could be located within the recreational area but removed from the playing fields and student activities. Such a Conference Center could also be used for meetings and short courses.

Housing Uses - At some future time, housing might be considered for the many Extension Service schools which are held at the Riverside Campus. The feasibility of such use is not known at this time, but space for such future use should be reserved.

Objectives for Goal 4:

- Provide for classification and grouping of uses.
- Provide for restrictive covenants to assure the proper grouping of similar uses in accordance with the Master Plan and to establish design control over buildings and facilities.

Goal 5. Support Facilities and Services - A complete complement of support facilities and services should be provided at the Riverside Campus.

Utilities should be provided for not only regular service needs, but with capacities to meet special research needs such as extra electrical power. Security services as well as complete fire protection services should be provided.

Objectives for Goal 5:

- Provide complete utility infrastructure properly sized to meet regular and special needs.
- Provide adequate services of shuttle bus, food, mail, recreation, etc.
- Provide a Commons Building which would house a Super Computer Center, library, meeting rooms for groups of 12 to 400, exercise facility with showers and lockers, reception area, etc.
- Provide a Conference Center.
- For the "light industrial" research and extension use area, provide a common building housing lockers, showers and meeting rooms.
- Provide security services and complete fire protection services.
Goal 6. Circulation - *Adequate circulation* should be provided at the Riverside Campus with a functional street system, ample convenient parking, and adequate provision for pedestrians and bicycles.

The street system should be well designed for future traffic loads. Buildings should be provided with off-street loading docks for direct deliveries. While streets with open ditches may be used in areas of low density development, curb and gutter paved streets with storm sewers will be needed in areas of high density development. Pedestrian ways should be provided throughout the Riverside Campus. Bicycle paths should be developed. Parking areas should be ample and as close to the buildings served as good design will permit. The on-site circulation and parking should be made as convenient as possible in keeping with the goal of reducing travel time between the Riverside Campus and the other elements of the University.

Objectives for Goal 6:

- Provide a well designed street system.
- Provide for pedestrian ways and bicycle ways.
- Provide ample, convenient parking.

Goal 7. Management - *Provide a management organization with the authority to implement the Master Plan.*

An adequate organization with the responsibility and authority to implement the Riverside Campus Master Plan is necessary in order to achieve the goals and objectives listed above. With such an organization, an agreed upon master plan and committed, adequate resources, the Riverside Campus can become a most desirable facility and an integral part of Texas A&M University.

Objectives for Goal 7:

- Prepare and adopt an acceptable management plan.
- Establish an appropriate management organization to guide the development of the Riverside Campus in accordance with the Master Plan.

This section presented the goals and objectives which provide guidance in the preparation of the master plan for the Riverside Campus. The next section analyzes existing conditions of regional setting, natural factors, land use, existing buildings, vehicular circulation, utilities, security and safety, and image and aesthetics to form the basis of the development of the alternative concept plans as presented subsequently in this report.
ANALYSIS OF PLANNING FACTORS

REGIONAL SETTING

The Riverside Campus is now accessible to Main Campus via University Drive (FM 60) to FM 2818 Bypass to State Highway 21 to the entrance on the north side of the site. This present access route from the northwest corner of the Main Campus to the present entry of the Riverside Campus is about eleven miles, with a perceived travel time of from 20 to 30 minutes. The construction of the University Parkway from near the new entrance to Easterwood Airport on University Drive to a new entry to the Riverside Campus will reduce the distance from Main Campus to the Riverside Campus to less than nine miles, with a travel time of some 15 minutes. This new route will bring the travel distance closer to the actual direct line distance of 6.7 miles. The travel time from the new Easterwood Airport to the Riverside Campus via University Parkway will be less than ten minutes. See Exhibit 1.

The cities of Bryan and College Station had a combined population of approximately 100,000 in 1985. A recent population forecast for the year 2000 for Brazos County was 248,000. Thus, extensive growth may be seen for Bryan and College Station. The major thoroughfare planning by the City of Bryan provides for three east-west arterials with two north-south arterials in addition to University Parkway to service the 30 square mile area west of FM 2818 Bypass, north of University Drive and south of SH 21. It has been reported that much of the land in this area has already been purchased by developers for speculative purposes. A number of varied residential developments may be built in a few years in the area. There should be ample housing opportunities for faculty, researchers, and staff for living in the area between the Riverside Campus and Main Campus. Such housing locations would permit a convenient division of the work week between the various campuses with a lower level of congestion than may now be found in other parts of the urbanized area.

The immediate lands around the Riverside Campus are rangeland and other agricultural uses. The picture of quiet countryside will probably continue for a number of years. The size of the Riverside Campus is such that the facility can provide an extensive landscaped open space around the entire site which will provide a permanent buffer against any adverse uses which may develop on surrounding properties in the near and long term future.

In its regional setting, the Riverside Campus may be physically separated from the Main and West Campuses, but it is within an easy working distance which, with the construction of the University Parkway and the provision of frequent shuttle bus service, will become even better.

NATURAL FACTORS

Climate

Typically, Brazos County, where the Riverside Campus is located, has a warm temperature and a humid continental climate which is modified by prevailing
EXHIBIT 1
REGIONAL SETTING
SCALE: 1" = 2 MILES
winds from the Gulf of Mexico. The area is characterized by long, warm and
dry summers and short, mild winters with brief periods of potentially freezing
cold weather. The average temperature is 83 degrees F during the summer
months and 52 degrees F during the winter months, with rare extreme tempera-
tures. Cold waves during winter may cause a sudden drop in temperature, but
rarely causes ground freeze and when it does, the freeze is short in duration.
The long growing season is favorable for the development of pasture and live-
stock.

Annual precipitation averages 39 inches, with dry summers and intermittent
thunderstorms of considerable intensity. In summer, droughts of varying
degree and duration occur. Due to the high evaporation rate and low water
holding capacity of soils, an important consideration in the site's develop-
ment will be irrigation system planning and design.

**Topography and Drainage**

Site topography is relatively flat-gently sloping from north to south. A
ridge in the upper northeast portion of the site directs drainage to the
southwest towards the Brazos River and to the east towards Thompsons Creek, a
branch of the Brazos River which flows from north to south. For additional
topographic information, see Exhibit 2.

The Thompson Creek watershed occupies an area of approximately 300 acres,
about 15% of the total site area. Two man-made lakes were built at the main
discharge point on the east boundary. Topography elevation in this watershed
ranges from 270 feet in the north corner to below 260 feet at the east
boundary. According to the Brazos County Flood Hazard Boundary Map published
by the Federal Insurance Administration (Community Panel No. 481195-0006A),
there are no 100-year flood plains within this watershed on the Riverside
Campus.

A greater portion of the site is located within the Brazos River watershed.
Its elevation ranges from above 270 feet at the northeastern boundary to below
245 feet at the southern boundary, a maximum difference of 25 feet and an
average slope of less than 1 percent. The 100 year flood plain is found in
small areas on the western and southern boundaries. No major storm water
channel exists in this watershed. Poor drainage can be found in several ponds
created by surrounding runways.

The existing developments are centered east and west of the ridge line which
divides the two watersheds. This area is and will be the prime location for
development due to its high elevation and ease of drainage. Because of its
gentle slope, it is possible that storm water in the Thompsons Creek watershed
could be piped to the Brazos River Watershed, eliminating construction of
separate drainage systems. While this is not necessarily a plan determinant,
it is an opportunity which should be evaluated in the implementation of the
approved plan.
Soils

The Riverside Campus is comprised of compacted clay soils that are nearly impervious to water. See Exhibit 3.

The predominant, poorly permeable clay soils on the Riverside Campus belong to two soil associations. The boundary between the associations roughly coincide with the ridge line dividing the two watersheds. To the west, within the Brazos River watershed, is the Crockett Association and to the east, within the Thompsons Creek watershed, is the Lufkin-Tabor Association.

The Crockett Soil Association is the dominate soil type on the Riverside Campus representing approximately 88% of the site, and the Bastrop Fine Sandy Loam and Irving Clay Loam are the dominant soil series.

The smaller Lufkin-Tabor Soil Association is actually the largest soil association in Brazos County. The two major soil series of this association are Caxtell Fine Sandy Loam and Travis-Axtell Fine Sandy Loam. The grayish, drouthly soils of this association are called claypan soils because they have very compact subsoils that are almost impervious to water. (Soil survey, Brazos County, Texas Soil Conservation Services, 1958).

Approximately 85% of all soils found on the Riverside Campus site fall within the following associations:

Irving Clay Loam (0 - 2% slopes)
Burleson Clay (0 - 2% slopes)
Houston Hunt Clay (3 - 6% slopes)

The remaining 15% of soils fall into the following associations:

Durby Loamy Fine Sand (0 - 2% slopes)
Bastrop Fine Sandy Loam (0 - 2% slopes)
Travis Axel Sandy Loam (3 - 6% slopes)
Axel Fine Sandy Loam (0 - 2% slopes)
Lufkin Eds Complex (1 - 3% slopes)

The latter 15% of soils associations occupy random pockets generally around the periphery of the Riverside Campus, and there is some evidence to indicate that this material was at one time alluvium.

In general, the Riverside Campus may be categorized as being of fair agricultural quality at best, as soils are poorly permeable and of such nature that they form a crust upon drying out after rains. This problem is compounded by the fact that this area receives approximately 32 inches per year in annual rainfall, the majority of which may be received in as short a span as 3 months or as long a span as 6 months with typically the least amount of rain fall during the growing season.

The soils in these associations are typically slightly acid and may range through neutral to slightly alkaline. Generally speaking, the soils that make up the majority of the Riverside Campus fall into capability Class 2, which
consists of soils with moderate, permanent limitations or moderate hazards to their maintenance. Within this capability class the soils fall into management group II-2 and are classified by the Brazos County, Texas Soils Survey, Series 1951, No. 1 as follows: Deep moderately fine to fine texture, slowly to very slowly permeable soils of the blackland prairie on nearly level to poor physical condition as to restrict the productivity of these soils. More specifically, they have poor plant soil moisture relationships, poor ability to absorb water and restrictions to root growth. The hard crust which forms on the surface of these soils after rains also inhibits air movement into the soil. The site soils in general seem to be compatible with lake development, and for the purposes of ornamental horticulture irrigation, acidification and/or pH management will be required to broaden the overall plant palette.

A final consideration related to the soils and subsurface conditions on the Riverside Campus is the potential for existence of hazardous waste materials. Since the Riverside Campus was a military base, potential for these materials exists. To date, no evidence of this type of material has been noted on the Riverside Campus.

In view of the undocumented hazardous waste materials on other former military bases it might be in the interests of the University to undertake a site assessment designed to offer an evaluation of potential contamination or environmental risks. A preliminary environmental site assessment might include:

- Obtain, review, and evaluate historical site data and assess potential environmental problems.
- Delineate site hazard areas.
- Review future site development plans with respect to the site hazard areas.

Should significant evidence of subsurface contamination be found from the preliminary phase a more detailed site assessment would be desirable to delineate depth and extent of such contamination and to evaluate environmental impacts of the contamination.

Vegetation

Vegetative character on the site, as shown on Exhibit 4, may be described in the following classifications:

- Mesquite dominant mature or early field succession
- Cedar Elm dominant mature or early field succession
- Experimental plot mature or under cultivation
- Cultivated row trees
- Post Oak dominant mature

Areas of mesquite dominance, typically occur in the western and southern portions of the site, while the incidence of mesquite is typical throughout
the site. Cedar Elm dominance is typically in the southeast portion of the site with some scattered cedar elms and clusters of cedar elms throughout the southern portion of the site.

Post Oak dominance is maintained at the eastern tip of the project with scattered post oaks through the remainder of the eastern, southern and in to the southwestern portion of the project. Numerous experimental plots occur within the boundaries of the runway many of which are used for aerial pesticide application experiments. Another apparent experimental area is located just to the northeast of the geographic center of the site and contains mature specimens of various species of arbor vitae, sycamore, and ash trees.

Indigenous vegetation within the site include cedar elm (ulumus crassifolia), post oak (quercus stellata), sugar hackberry (celtis lavigata), eastern red cedar (juniperus virginia), pecan and hickory (carya species), and mesquite (prosopius glanoulosa). No indigenous shrubs of any merit were noted. Indigenous grasses included Indian grass and switch grass. Among trees which have been introduced to the site over the years are live oak (quercus virginia), Arizona ash (fraxinus velutina), sycamore (platanus occidentalis), crepe myrtle (lagerstroomia indica), and arbor vitae of numerous cultures. Of these introduced materials, all appear to be doing well, although some incidence of leaf burn association with highly alkaline water and carbonate build up (similar problem occurs in Houston) was noted on sycamores.

It may be generally said that due to the relatively poor soil qualities there will be limited agricultural use without proper management techniques. Lack of permeability in soils character impedes introduction of water and air into root zones and would make implementation of any plant materials without extensive soil preparation very difficult. The majority of material noted as indigenous material on site appears to be of a drought tolerant nature thus consideration for its use or plants of similar lineage would have merit.

LAND USE

The Riverside Campus is surrounded by farm lands with the closest development four miles away at the SH 21/FM 2818 intersection.

The Riverside Campus’ existing land use is dominated by pasture land and old air force runways which are used for training and experimentation by various agencies. A combination of administrative, academic, training, research and extension services are the current dominant uses of the developed area on the Riverside Campus. See Exhibit 5.

The heterogeneous architectural character present on the Riverside Campus does not convey a cohesive campus image. With many of the old buildings and facilities retained on the Riverside Campus, the development is still perceived as a military base. New structures have been developed randomly independent of an organized master plan. Lack of a formal master plan and a
facilities management program has permitted haphazard construction and demo-
lition of facilities. Various test site and field training facilities create
an industrial like image not compatible with the planned future uses for the
site. Unfortunately, the problem has been exacerbated by poor maintenance
practices.

In addition, the dimensions of the existing circulation system grid is ineffi-
cient for contemporary campus building footprints and presents awkward build-
ing orientation and access problems. The existing narrow spacing between the
adjacent streets is a result of the Campus’s previous use as an air force
base.

BUILDINGS

The current status of building space was made based on an extensive survey of

With the exception of several recently constructed buildings, all of the
buildings were constructed in the 1940’s and 50’s and are lacking many modern
appurtenances. Most buildings are not handicap accessible and lack proper
sidewalks from streets or parking lots to building entrances. Buildings are
inadequately lit and lack ample parking spaces.

A potential problem was found in many of the old buildings as they contain
asbestos based building materials. These are now considered a health hazard.
Consideration must be given to renovation/removal of these asbestos materials.

TRAFFIC CIRCULATION

Present traffic circulation patterns consist of a single paved entrance into
the Campus via State Highway 21, with an internal grid system of interconnect-
ing streets. There are two minor entrances that are not used, as both are
unimproved dirt roads. See Exhibit 7.

Entrance into the Riverside Campus will be drastically changed with the
construction of University Parkway on the northeast side of the Riverside
Campus. A sophisticated interchange will be proposed to connect the new
Riverside Campus entrance to the University Parkway. The interchange will be
located on the far east side.

Internal streets consist of 20 to 22 foot wide black top pavement with open
ditches on either side. The streets were constructed in the early 1940’s and
are in only fair condition. There are also some substandard streets which are
unpaved and in poor condition. These are primarily located on the south side
near the sewage treatment plant. It is questionable whether or not the unim-
proved streets will fit the ultimate street and circulation plan. The paved
streets could fit into the early phases of development. As more site improve-
ments are made, however, these will need to be improved into curb and gutter
streets with storm sewer drainage.
EXISTING STREETS AND PARKING

TEXAS A & M UNIVERSITY
RIVERSIDE CAMPUS

EXHIBIT 7
Internal paved streets are as follows:

<table>
<thead>
<tr>
<th>Street Name</th>
<th>Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bryan Road</td>
<td>North-South</td>
</tr>
<tr>
<td>Warehouse Road</td>
<td>East-West</td>
</tr>
<tr>
<td>Avenue A</td>
<td>North-South</td>
</tr>
<tr>
<td>Avenue B</td>
<td>North-South</td>
</tr>
<tr>
<td>Avenue C</td>
<td>North-South</td>
</tr>
<tr>
<td>Avenue D</td>
<td>North-South</td>
</tr>
<tr>
<td>3rd Street</td>
<td>East-West</td>
</tr>
<tr>
<td>4th Street</td>
<td>East-West</td>
</tr>
<tr>
<td>5th Street</td>
<td>East-West</td>
</tr>
<tr>
<td>6th Street</td>
<td>East-West</td>
</tr>
<tr>
<td>7th Street</td>
<td>East-West</td>
</tr>
</tbody>
</table>

Traffic volumes along Highway 21 average approximately 8,000 vehicles per day (1986 count). Traffic in and out of the Riverside Campus is merely a fraction of this amount as most of this traffic is between Caldwell and Bryan.

No traffic counts are available within the Riverside Campus. Most traffic occurs along Bryan Road as it is the main entrance from State Highway 21. After Bryan Road, traffic occurs along Avenues A, B, C, and D, as well as 3rd, 4th, 5th, 6th, and 7th Streets. High traffic volume occurs near the intersection of Avenue D and 7th Street in the proximity of the heavy equipment school and the new Protein Research Facility. Another intersection that has higher traffic volumes is 4th Street between Avenue D and Bryan Road near the new building that houses TTI, TEEX, TEES, and Law Enforcement Training. However, there are no known major problem areas related to traffic movement on the Riverside Campus with the exceptions of speeding and stop sign violations.

PARKING

Parking facilities on the Riverside Campus are marginally adequate. The newly constructed buildings were provided with enough parking space to handle their occupants. There is also plenty of non-designated open space that is being utilized for parking around some of the older buildings.

Since the Riverside Campus is removed from Bryan and College Station, even with shuttle bus service, many who work there will drive their own car. Therefore, as the Riverside Campus grows, additional parking must be provided. See Exhibit 7.

EXISTING UTILITIES

Water Supply and Distribution System

Improvements to the water supply and storage facilities in recent years have alleviated any immediate need for new construction. The present facilities should provide water supply for several years with routine maintenance and
upkeep. The distribution system will probably be adequate to accommodate the early stages of new development but as the Riverside Campus population increases, it will need renovation. See Exhibit 8.

Water production is primarily from three wells. Two wells are located on the Riverside Campus pump station site and two wells are located on the south side of State Highway 21. The on site well designated as A-7 is a deep well and has been recently reworked, improving its capacity to 2000 gpm. The other two wells, designated as A-5 and A-6 are somewhat shallower and produce water at the rate of 250 gpm and 160 gpm respectively. Well A-6 has dropped in production and has become unreliable. In addition to these three wells, there is a line that interconnects the pump station with the main line that serves all of the Main Campus. This interconnect line is 18 inches in diameter and can provide additional water supply from the Main Campus well field as required.

Storage and pumping facilities on the Riverside Campus are more than adequate for existing needs and should provide service for future expansion. Water that is produced from the wells mentioned above is pumped into a 300,000 gallon ground storage tank that serves as pumping supply. In addition, there is a 500,000 gallon elevated storage tank 135 feet in height to provide additional water pressure in time of high demand. Both the ground storage tank and elevated storage tank are located at the Riverside Campus pump station site.

The pump house has three primary pumps with a fourth reserved for emergency use. All pumps have electric motors with the exception of the emergency pump which is gasoline powered for use in times of electrical outages. The three primary pumps are rated at 200 gpm @ 15 horsepower, 500 gpm @ 25 horsepower and 700 gpm @ 40 horsepower; the fourth or emergency pump is rated 500 gpm @ 25 horsepower. All pumps are in fair condition, and should provide adequate service for several years with routine maintenance. The pump station also has facilities to cool and chlorinate ground water prior to use.

The distribution system is primarily made up of a loop system consisting of four, six, and eight inch diameter steel and cast iron lines. The condition of these lines is questionable, however, they should provide adequate service for the initial development phase. As construction progresses and the usage rate increases, a phased replacement program should be initiated.

**Wastewater Collection and Treatment Facilities**

Overall, the entire system is dated and in questionable condition. It should not be counted on to provide service as the Riverside Campus develops. It may be adequate in the early stages of development, but will become overburdened quickly if an improved system is not provided. See Exhibit 9.

The original wastewater treatment plant was constructed approximately 40 years ago. It is no longer in service and is in such condition that renovation would not be feasible. The present treatment facility consists of a single Imhoff tank and two stabilization ponds that were constructed in 1977. Under
existing conditions this facility is adequate and can probably accommodate only marginal amounts of additional flow due to development. It will not serve many high volume users as it is merely a primary method of wastewater treatment. An evaluation will have to be made during development phases to determine when additional treatment facilities will become necessary.

The wastewater collection system consists of six to 15 inch vitrified clay pipe that was installed over 40 years ago. The general condition appears to be fair, but upgrading will be required in the middle stages of development.

There is also a small amount of PVC pipe ranging in size from three to eight inches in diameter. These lines were installed to serve several recently constructed buildings at the Riverside Campus.

**Storm Drainage**

The existing system is basically surface flow via open ditches and culverts at intersections. There is no system, except in the runway areas for draining the site in underground storm sewers. Drainage around many of the buildings is poor and needs to be improved by proper grading techniques. Except for slow runoff from the site, there are no present flooding problems.

**Gas Supply**

Natural gas is supplied to the Riverside Campus via Lone Star Gas Company's six inch high pressure transmission main across State Highway 21. The main operates at 250 to 300 psi, while the existing on site system operates at 25 psi. Contact with Lone Star's Area Superintendent indicated that future supply for the Riverside Campus during development phases should not be a problem.

The existing lines were installed in the 1940's and 50's, at a minimum depth of two feet of cover. The pipe material in the older lines was black steel with bitumen coating. Some new lines installed in recent years were PVC gas pipe.

As with the other utilities, the older lines should be adequate in early phases of development, but they will have to be replaced in the later phases. Exhibit No. 10 illustrates the Natural Gas System.

**Electrical System**

The primary electrical system at the Riverside Campus consists of 12.5 kV overhead lines installed on wooden poles. In general, the lines are routed along streets and serve the various buildings with overhead service. The conductor on the main feeders is No. 4 AWG copper with laterals consisting of No. 6 AWG copper. Transformers are mounted on poles except the latest addition of large units which are installed at ground on concrete pads. See Exhibit 11.
Power supply to the Riverside Campus is provided by the City of Bryan through a 12.5 kV overhead feeder. This Bryan feed receives its power from a 6,000 kVA substation located on State Highway 21 which serves the surrounding area in addition to the Riverside Campus. Primary metering is provided at the point of service near the main entrance of the Riverside Campus. The peak load occurs in the summer months when air conditioning equipment is operating. The peak load recorded has been 2,200 kilowatts.

The electrical system was installed in the early 1940’s when the original air base was constructed. The poles, crossarms and transformers have been in service for about 46 years and are reaching their expected useful life. Equipment is now individually replaced as it fails. It is estimated that approximately 15 percent of the poles and crossarms have been replaced. This procedure can be continued to extend the life of the facilities; however, the failure rate can be expected to accelerate unless a major replacement program is undertaken.

It would appear that replacement and upgrading can be planned and programmed with the phased development of the Riverside Campus. Consideration should be given to replacing the overhead lines with an underground system as the Riverside Campus develops and upgrading of the electrical system is required. The existing 6,000 kVA City of Bryan substation is not large enough to supply the total proposed power load and will have to be enlarged as power requirements grow. To reduce interruptions and increase the reliability, a second power supply feeder should be obtained.

SECURITY AND SAFETY

Currently, security is provided by resident employees who are on the property on weekends and after hours. They periodically man the guard house at the entry to the Riverside Campus. Due to the large size of the site and the widely scattered buildings, this security is far from being adequate. In addition to this limited security, each agency on the site provides its own security, which in practice is very limited and costly protection or no protection at all. There are no police patrols from either the Main Campus or the City of Bryan securing the Riverside Campus. The old buildings have deficiencies such as old locks and hardware which adds to general security problems. Concern for security is growing as more costly equipment is left on the site. Fortunately, there have been few losses to date.

Fire is a constant hazard with the many, scattered wood buildings. Fire protection is currently provided by the volunteer fire district. Fortunately, there has been only one major fire in the past several years. This fire occurred in the early morning hours with the building being almost completely destroyed before it was detected and fire personnel arrived at the scene. Solutions to the problem of providing adequate fire protection will need to be found.
IMAGE AND AESTHETICS

Existing Image Conditions

The use of the Riverside Campus as an Air Force Base has necessarily impressed certain characteristics on the site. The street pattern is a simple grid; landscaping is limited to open grass areas, trees are few and far between with the notable exception of one small densely treed area. The architecture is functional, a combination of single or two story wooden structures, two and three story brick buildings, and metal shed-type buildings.

Signage within the Riverside Campus is minimal. Most of the buildings are identified by number and some by tenant use. There is no consistency in the application or location of signs. No directional sign system is currently in place. Traffic and other regulatory signing is inconsistently applied or nonexistent. The main entry to the site is currently a guard-house/barrier structure. This structure was consistent with the limited access required by a military facility.

Since the University acquired the property, it has been used by a wide variety of groups for research, training, storage, and academic extension activities. Many of the activities located on the property did not choose this location, rather they accepted it for lack of "better" space elsewhere. Consequently, many of the activities located on the site perceived and treat their accommodations as "temporary".

Aesthetic Impacts

The impression created by the existing site conditions is one of benign neglect. The site is not perceived as a permanent home for most of the activities located there. The site can best be described as a temporary, military/industrial environment. Although renovating the existing structures and landscaping would mitigate the impression of neglect and abandonment, the site would retain a strongly military/industrial feeling that is incompatible with the planned campus development activities of the University. The entry structure clearly states "Keep Out" isolating the site further from the surrounding ranch lands and from the Main Campus 11 miles away.

The Proposed Campus Image

It is the University's plan to convert this property into a campus-style community to provide research and extension services as a part of the total University program. To create a campus environment on the site, the following criteria should be considered in designing the environment.

- Land Use - The land uses must be organized in such a way as to separate incompatible uses and to consolidate office, classroom, and laboratory facilities into a Technology Core as a focus to the campus.
Landscape Guidelines - Landscaping is a critical element in conveying a campus-style aesthetic. Guidelines should be developed to assure an integration of formal plantings and informal vistas to the grazing and pasture lands. The guidelines should conform to standards established on the main campus and the research park insofar as they are appropriate.

Architectural Guidelines - Architectural Guidelines should be established for the site that support the existing campus guidelines, but take into consideration the industrial uses required by some of the groups. Any renovation of existing buildings should create a campus atmosphere by including architectural treatments that will minimize the military/industrial aspects of the buildings.

Signage Guidelines - Signs will be an important element in integrating the new campus with the main campus and the research park. Sign Guidelines for the Riverside Campus should coordinate with the existing campus sign guidelines. The entry to the Riverside Campus should be an invitation to enter and reflect the dignity of Texas A&M University.
ALTERNATIVE CONCEPT PLANS

Considering site constraints, existing and future potential land use, circulation and image analysis, as well as input received from existing and potential users of the Riverside Campus, a number of general planning guidelines were formulated. Three alternative schemes were developed for the campus plan. These three schemes are identified as: (1) Grid Concept; (2) Loop Concept, and (3) Curvilinear Concept. See Exhibits 12, 13, and 14. General planning considerations for these three schemes are as follows:

- With the proposed new University Parkway connecting the Riverside Campus with the Main Campus, the existing campus entry from State Highway 21 will be abandoned and relocated eastward near the new intersection of University Parkway and the county road along the east campus boundary. Location of the new entry involves two planning and design issues: (1) the entry road must have a geometric configuration that would allow free flow access to the campus while maintaining access to State Highway 21 for residents along the county road; and (2) the entry must be properly graded and landscaped to display a quality image, which will be essential to improve the overall appearance of the campus. A purely utilitarian solution to the project entry would be a crippling blow to achieving a high quality university image.

- Areas west of the runways should be maintained as pasture land and other open land uses. No change is proposed for the current use of runways as testing and training areas; however, one runway should be considered as active for aircraft operation.

- The developed area should be zoned to include a Technology Core, runway and apron uses, extension service activities, and recreation areas. Proper buffering and landscaping should be used to separate the industrial type uses such as heavy equipment training and field testing from the proposed campus and research environment. The recreation areas should also be separated from the rest of the campus proper.

- Create a Technology Core to create a high caliber Campus image.

- Locate a Conference Center and a Recreation Center in the vicinity of the existing lakes with an opportunity to expand the north lake. The expansion of the south lake is not recommended because the upstream area is fairly wooded. The wooded area and the south lake provide a natural division between the Conference Center and the Recreation Center.

- A Science and Technology Interpretive Center is proposed to house items as well as documents that would display activities, programs, and the history of the Riverside Campus.
The University Parkway will provide the major access and frontage to Riverside Campus. Therefore, the parcel fronting University Parkway, which is currently used by the College of Veterinary Medicine, should be preserved for future expansion of the Technology Core to strengthen the envisioned Riverside Campus image.

Since the projected use of the Riverside Campus indicates a small full-time campus population, no large central parking area will be needed. Thus, parking lots adjacent to individual buildings are recommended to shorten walking distance between building and parked vehicles.

In addition to these planning considerations, a few visual features on the Riverside Campus should be preserved and strengthened to improve its overall image. These include the open pasture land, the lakes, and a few groves of trees located primarily at the proposed new entry.

Another feature that should be carefully evaluated is the frame warehouses located to the northwest of the developed area. As these buildings appear to be sound and preservable, their interior and exterior could be renovated to become unique features of the Riverside Campus.

**SCHEME ONE - GRID CONCEPT**

A diamond interchange with a fly over entry provides direct access into the Riverside Campus from University Parkway while maintaining the existing county road alignment. This ramp becomes a curvilinear entrance boulevard with a generous median that enhances the open space character of the Riverside Campus. The boulevard drive will provide a pleasurable entry sequence visually terminating on the Commons Building. The boulevard would continue as two one-way streets on either side of the Commons Building. The major Riverside Campus buildings, including the Commons Building/Super Computer Center, administration building and museum would be strategically sited between the two one-way streets as the main focus of the Riverside Campus.

This plan utilizes portions of the existing grid road system to create a formal, central campus core with an historically based, legible auto circulation system. Abandoning the use of interior roads to pedestrian circulation and/or open space would create usable and efficient building parcels compatible with the existing infrastructure. The grid system encompasses the Technology Core and separates it from less compatible adjacent land uses. Smaller "loops" extending from the central grid would provide access to extension service and future development areas. These loop roads can provide more flexibility for undefined future development areas and encourage a less structured arrangement of facilities.

The Conference Center and Recreation Center are located to take advantage of existing vegetation and lake features while maintaining direct access from central campus activity centers. Separation of the two uses is emphasized by separate lakes, a vegetative buffer and individual access roads.
The open land uses, active runway, and auto testing area are best suited to their existing locations and are therefore maintained as such. The open land uses are predominantly pastoral grazing areas. Positioned adjacent to one another, they provide an attractive open space zone along State Highway 21.

Areas recommended for significant landscape improvements are the major entry, the entry boulevard, the greenbelt separating the technology core from the extension service and field testing area, and the recreation area. Bikeways along the loop road and meandering trails provide a link to recreation areas with the other uses.

**SCHEME TWO - LOOP CONCEPT**

In Scheme Two, access would be provided by a trumpet interchange system which would allow for direct, non-signalized, ingress and egress to and from the Riverside Campus. The county road alignments would be adjusted to accommodate this system. The existing road would be redirected to the southwest boundary of the Riverside Campus to connect with State Highway 21 on the west side of the Riverside Campus. To accommodate this relocation, sufficient ROW would be provided.

The entrance drive would be less scenic than in Scheme One but will provide a strong formal approach to the Riverside Campus, terminating at the Commons Building. The plan emphasizes a formal open space system with pedestrian linkages to major activity centers within the Technology Core. The Science and Technology Interpretive Center and Commons Building/Super Computer Center act as anchors and activity generators for the linear central open space.

The loop road surrounding the Technology Core, provides access to major land use zones and physically separates the Technology Core from less compatible uses. Cul-de-sacs penetrate the Core zone (utilizing existing infrastructure where possible) for limited auto access to concentrated parking areas and building parcels. This system also creates a vehicle-free technology core area in which pedestrians do not have to cross any traffic to go from building to building.

A secondary loop is created through extension service and future development uses from the Riverside Campus entrance road to the main Technology Core loop. Direct access from the entrance drive allows Extension Service and Open Land Use traffic to bypass the Technology Core, thereby alleviating use conflicts. The loop road provides more flexibility for undefined, future facilities. Service access only, is provided to the auto testing and engineering experiment areas to discourage non-users from entering.

An existing, heavily vegetated zone is supplemented west of the Technology Core to visually and physically separate incompatible adjacent uses. The Conference Center and Recreation Center are again located to utilize natural features. Sharing a common entrance drive and trail system access, they are more closely related than in Scheme One and create a distinctive recreation zone. Extension of the northern lake provides an amenity to the Conference Center, as well as a visual feature from surrounding roadways.
The open land uses and the runway areas are maintained as in Scheme One.

SCHEME THREE - CURVILINEAR CONCEPT

Scheme Three is based upon the assumption that existing buildings and infrastructure need not be retained east of the TTI and Engineering Experiment Area. The existing grid pattern would be abandoned and replaced with a "naturalistic" curvilinear circulation system characteristic of contemporary office park development on undeveloped sites.

As in Scheme Two, the trumpet interchange provides major access to the Riverside Campus. Unlike Schemes One and Two, a secondary entry from State Highway 21 also provides direct access to the entire Campus. An informal spine road connects the two entry points serving as a major thoroughfare. The road's curvilinear alignment would take advantage of views into a major open space system.

From the spine road, the secondary loops service the various Campus use zones and create large, flexible development parcels. The informal character of the road and open space systems encourages natural placement of facilities in keeping with the open space and man-made "natural" amenities. The Technology Core internally focuses on the newly created lake and pedestrian trail system and is externally buffered from adjacent uses by the loop road and a vegetative zone. Extension service uses are limited to the southeast corner of the site so that a larger area to the north can be set aside for future development associated with the technology/research uses. The Conference Center and Recreation Center are more closely related in a recreation zone and would be connected visually and functionally to the extensive open space system.

From the spine road, the secondary loops service the various Campus use zones and create large, flexible development parcels. The informal character of the road and open space systems encourages natural placement of facilities in keeping with the open space and man-made "natural" amenities. The Technology Core internally focuses on the newly created lake and pedestrian trail system and is externally buffered from adjacent uses by the loop road and a vegetative zone. Extension service uses are limited to the southeast corner of the site so that a larger area to the north can be set aside for future development associated with the technology/research uses. The Conference Center and Recreation Center are more closely related in a recreation zone and would be connected visually and functionally to the extensive open space system.

EVALUATION OF ALTERNATIVE CONCEPT PLANS

Of the three concept plans presented, the Loop System was unanimously preferred over the Grid System or the Curvilinear System. The selection was based heavily on preferences rather than a lack of merit in the other two schemes. The primary reason for selecting the Loop System Scheme is because it can readily adapt to the existing Campus condition and create an attractive
environment with a contrasting informal setting to the core grid so necessary for the success of the Riverside Campus.

The establishment of criteria for evaluation of the concept plans was based upon the following assumptions:

- The Riverside Campus has an existing grid style infra-structure system and is currently occupied, it is necessary that the proposed plan have the flexibility to adapt to that network to maximize easy redevelopment and phasing.

- While the University System has not established a redevelopment budget, the preferred scheme should reflect the cost effectiveness factor.

- It should also be able to accommodate future development because of the undetermined role of the Riverside Campus in the Texas A&M University System.

The four major evaluation criteria established were: Adaptability, Phasing, Redevelopment Cost, and Future Development.

The three schemes were then compared in terms of these criteria. The results are summarized in Table 4. It should be noted that both the Grid and Loop System schemes are comparatively low in development costs, adapt and phase well with the Campus, and possess good opportunity for future development. Though the Curvilinear System Scheme creates a more natural image, which may be desirable, development would be very costly and the ability to adapt (phase) to the existing grid pattern infrastructure would be impossible. Of the two schemes that do work well with the existing Campus, the Loop Scheme is preferred. It creates an automobile free Technology Core and the more informal flexible image, the major shortcoming of the Grid Scheme.

Three University Parkway Entry Interchange concepts were presented. The Trumpet concept became the preferred alternative. The Diamond Interchange concept would require a three level structure to accommodate the movements on the University Parkway entry to the Campus and the County road. Such a super-structure is costly and it does not provide the desirable "Campus image". However, the trumpet interchange must take into consideration the access needed for the adjoining properties which currently front on the southern county road. Access to the adjacent land parcels could be provided with a ROW extension through the west side of the Campus which would connect to another County road or through the east side of the Campus via the Campus Entry Road.
<table>
<thead>
<tr>
<th>TABLE 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUMMARY EVALUATION OF ALTERNATIVE CONCEPT PLANS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>SCHEME 1</th>
<th>SCHEME 2</th>
<th>SCHEME 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCEPTS</td>
<td>Grid System</td>
<td>Loop System</td>
<td>Curvilinear System</td>
</tr>
<tr>
<td></td>
<td>Diamond Interchange with Fly-</td>
<td>Trumpet Interchange with County Road</td>
<td>Trumpet Interchange</td>
</tr>
<tr>
<td></td>
<td>over Entry</td>
<td>Realignment</td>
<td>with County Road Connection</td>
</tr>
<tr>
<td>IMAGE</td>
<td>Formal</td>
<td>Formal</td>
<td>Informal</td>
</tr>
<tr>
<td></td>
<td>Strong Central Core with</td>
<td>Strong Central Core with Pedestrian</td>
<td>Natural Central</td>
</tr>
<tr>
<td></td>
<td>Vehicle Emphasis</td>
<td>Emphasis</td>
<td>Core with Open Space Emphasis</td>
</tr>
<tr>
<td>ADAPTABILITY</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Poor</td>
</tr>
<tr>
<td>PHASING</td>
<td>Excellent</td>
<td>Good</td>
<td>Poor</td>
</tr>
<tr>
<td>REDEVELOPMENT COST</td>
<td>Low</td>
<td>Low</td>
<td>High (due to creation of natural image)</td>
</tr>
<tr>
<td>FUTURE DEVELOPMENT POTENTIAL</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
</tbody>
</table>

Source: Bovay Engineers, Inc.

The succeeding master plan is formulated on the Loop Scheme and the trumpet interchange with the proposed University Parkway.
The Master Plan was formulated following the selection of the Loop Scheme. Modifications were made to accommodate the review comments as well as the additional information provided during and after the alternatives evaluation process. These inputs included: (1) realignment of the secondary entry from State Highway 21 to eliminate the possibility of the secondary entry road from being mistaken as the airport runway; (2) development of the main entry road as a boulevard; and (3) provision for possible golf course in open land use area.

The provision for a golf course caused some consequential changes to the Loop Scheme Concept. The lakes were expanded to serve as golf course irrigation reservoirs and playing hazards. The Conference Center and Recreation Area are dramatically changed including access to these areas which were relocated from the Inner Loop Road to the Entry Road. Nevertheless, the Conference Center and the Recreation Area maintain a connection with the Technology Core via pedestrian and bike trails.

CAMPUS MASTER PLAN CONCEPTS

Eight planning determinants were considered in developing the Alternative Concept Plans. These included:

* Change the Campus entry from SH 21 to University Parkway;
* Create a Technology Core as the focal point;
* Place the Conference Center and Recreation Areas near the existing lake;
* Create a Science and Technology Interpretive Center;
* Provide University Parkway frontage for higher image uses;
* Keep the area west of the runways as open use areas;
* Zone the internal development areas and screen undesirable land uses; and
* Provide unity and cohesiveness of Campus design at each development phase.

In addition to these planning determinants several urban design objectives were also adopted to aid in the development of the Campus Master Plan. Those additional objectives are as follows:

* Ensure a gracefully engineered University Parkway interchange at the Campus Entry;
* Provide a pedestrian Campus for the Technology Core area;
* Provide a formal landscape image for the Technology Core as contrast to the informal landscape image for the remainder of the Campus;
* Locate parking behind buildings away from the streets and well shaded by trees;
* Create a Technology Core Central Plaza at the terminus of the Entry Boulevard;
* Preserve the old chapel or create a new symbolic remembrance as a focal point for the Technology Core Central Plaza;
* Provide for an 18-hole golf course divided into two 9-hole loops;
* Create golf course irrigation reservoirs to serve as scenic elements, to provide golf course irrigation and playing hazards, and potentially for storm water detention; and
* Create a major green belt to screen the Extension Use Area from the Technology Core.

MASTER PLAN ELEMENTS

The Master Plan has been presented as an illustrative combination of land use, traffic circulation, and open space to the more intense developed segment of the Campus, see Exhibit No. 15. It is also composed of a series of major plan elements. The land use plan is more generalized and has been developed for the total Campus, see Exhibit No. 16. The land use plan identifies boundaries of major use areas and parcel numbers to afford greater ease of comprehension of the plan. The description of the major plan elements is presented in the succeeding discussion.

University Parkway Entry Interchange

A trumpet design is proposed for the University Parkway/Entry Boulevard interchange. Since it is the first major structural and image element people will perceive, the Campus quality is viewed first in terms of this interchange. Therefore it is a very important element of the Riverside Campus. The Master Plan proposes that the University Parkway Main Lanes be slightly depressed, while the Entry Boulevard ramp fly-overs should be raised over the main lane. The Riverside Campus warrants a high image interchange with gracefully articulated grade changes accompanied by an elegant bridge structure. The engineering design of the interchange would become a significant landmark for the Campus, the University and the community.

Entry Boulevard

The Entry Boulevard, Exhibit No. 17 which leads into the heart of the Campus has a wide variable median which will result in a powerful sense of arrival.

The Entry Boulevard from University Parkway is bordered with informal plantings and the golf course on both sides. Approaching the first intersection, a major water body will be visible to the west. This water body is an expansion of the existing northern lake. At the intersection, to the east will be areas for future expansion while to the west there will be the proposed recreational facilities. This intersection will be marked with entry monuments and formal planting to form a portal like image. West of the intersection, the boulevard will flare until it meets with the two existing streets flanking the north and south of the old Air Force Headquarters building. The streets will be lined with double rows of major canopy trees on the 75 feet landscape setback easement. Low and gently sloping berms in the median and along the west side of the Entry Boulevard will maintain visual contact with the recreation area.
The west side should be graded high enough to screen the visibility of parked vehicles. The wide entry median will provide an openness. Although the Entry Boulevard terminates at the Inner Loop Road, the openness of the Entry Boulevard continues into the plaza of the Technology Core. Primary access is excluded along the Boulevard.

Technology Core

The Technology Core, see Exhibit No. 18, is bounded by the Inner Loop Road. The plan proposes a Central Plaza flanked by seven major structures with openings on the east side toward the Entry Boulevard. At the terminus will be the most important buildings on the Campus, including the important Commons Building. This portion of the site should be raised above the plaza to create a strong view from the buildings down to the plaza and up from the Entry Boulevard.

Formal planting and higher density development are used to signify the status of the Technology Core. All parking is to be located internally and be accessible by cul-de-sac streets which would lead access off of Inner Loop Road.

At two locations, the proposed golf course will be brought to the edge of the Technology Core to provide the area with leisure breathing space, both visually and psychologically.

The Commons Building will include a reception lobby, meeting rooms for groups from 12 to 400 persons, dining facility with complete kitchen, exercise facilities and lockers, mail service facility, administration office, offices, and possibly a computer center.

Loop Road - The Inner Loop Road circulates and defines the Technology Core which will be a rectangle approximately 1500 feet by 3300 feet. A generous 100-foot outside setback zone will enable gentle berming and screening. Informal planting is recommended in this area to extend the natural image of the golf course which touches Inner Loop Road at two locations. A 370-foot green belt zone is recommended to screen those uses at the Apron Area from the Technology Core.

A 50-foot inside setback planted with formal canopy trees will soften the visibility of buildings. Parked vehicles should not be visible from the Inner Loop Road. Parking lots are connected with the Inner Loop Road in cul-de-sac streets to minimize conflicts of traffic flows.

Central Plaza - The Central Plaza is comprised of three existing blocks containing the former Air Force Headquarters and Chapel. The headquarters building will be removed to open up the Plaza at the eastern end and create a physical, visual, and psychological connection with the Entry Road.

The Chapel, which has been used as a congregating area, should be preserved for its simple and unique architectural quality and as a symbol of the history of the Campus as an Air Force base and as a Research and Extension Center. In the future the chapel might be replaced with a suitable focal point structure.
of remembrance. It will be circled by vegetation to create a focal point in the Plaza. Major buildings and formal canopy trees will contain it on the west, north and south sides. Pedestrian walkways are designed in the tradition of the Campus green which will bisect the Plaza and be planted informally to provide shade and soften the grandness of the large open space. The building at the western end will become the visual terminus of the Plaza and the Entry Boulevard. Two axial pedestrian corridors in north and south direction will connect the two major parking areas and other buildings.

Parking - Two major parking areas located north and south of the Central Plaza provides 3,700 parking capacity, sufficient to support 1.85 million SF of gross floor area inside the Technology Core. This assumes two spaces per 1,000 SF of floor area. Since the design capacity proposes 2.4 million SF of building floor area, an additional 1,100 parking spaces will ultimately be required. These additional spaces can be integrated with the individual building site plans. However, the area is not anticipated to be fully developed by the planned horizon year of 2010.

Each major parking area is accessible from three cul-de-sac streets and comprised of five interconnected parking lots separated by pedestrian corridors to break down the perception of a vast concrete paving area. Canopy trees are planted within the parking lots to provide shade for parked vehicles and pedestrians.

Pedestrian Corridors - A cruciform system of pedestrian corridors serves to connect the Central Plaza, parking areas and other buildings within the Technology Core. The corridors intersect to form two secondary pedestrian focal points where fountains, theme trees, or other vertical elements should be placed to break up the long sight distance along the corridors. Projected from the Central Plaza in north and south directions, the pedestrian corridors carry the theme of formal planting to their secondary focal points and beyond. The intent is to mark the transition from formal to an informal planting image to provide different walking experiences. The east-west pedestrian corridors also serve as the primary links for the proposed Campus pedestrian trail loop.

Buildings - There are four building sites provided in each corner of the Technology Core as well as the five smaller building sites surrounding the Central Plaza. Buildings around the Central Plaza must correspond to the function of defining the central open space and the incoming visual image from the Entry Boulevard. The Commons Building located at the western terminus should be a major piece of architectural design and should be sited at a higher elevation than any other buildings on the Plaza.

The two buildings at the eastern end of the Plaza should be designed to reflect the gateway image of the Central Plaza, the Technology Core, and the entire Campus. The four largest building sites located at the four corners of the Technology Core range from seven to nine acres in size. The two buildings on the eastern side are of greater importance than the two on the western side because of their fronting location and overlooks to the golf courses. The northeastern site could be developed later because of the presence of an existing administration building which should be maintained until its operations cease to be cost effective.
Recreation Use Area

The recreation area is comprised of a Conference Center, Recreation Center, Club House, 18-hole golf course, a trail system, and other recreational facilities. The area can be reached in two ways; primarily by vehicle from the Entry Boulevard and secondarily by pedestrian trails connecting it with the Technology Core. The access road will wind around the expanded lakeshore via a smooth curvilinear street informally landscaped with primarily trees to provide a relaxed recreational environment. The area will be focused on the Club House with the Conference Center to its south, Recreation Center and parking to its north, the first nine-holes to its east, and the second nine-holes to its west. Both the Conference Center and Recreation Center facilities should be located on the lakeshore to maximize the use of the water amenity. This siting arrangement is necessary to insure the functional relationship of various buildings and activities, furthermore, the area is fairly wooded with existing plant materials. The development of lakes, buildings and other facilities should consider not only to have least disturbance of the existing forest but also to use the existing forest to strengthen the newly created environment.

Conference Center - This 50,000 SF facility will be strategically located at the terminus of Recreation Area Road between the two existing lakes with bridges over the connecting canal. A sawtoothed wing or similar architectural device should extend toward the west along the lake edge to maximize the views to the lake. The Center will have meeting rooms, reception area, lodging rooms, and a dining facility. Parking should be provided near the facility for convenience with additional parking located north of the Club House.

Recreation Center - This 40,000 SF facility is proposed to be sited between Recreation Area Road and the expanded northern lake. The facility should be sited to maximize its exposure to the northern lake and the green of the 9th hole. The Recreation Center would provide a large hall for dancing and group activities, smaller rooms and a small kitchen facility for serving refreshments. Parking should be provided across Recreation Area Road at the main parking lot.

Club House and Related Facilities - The Club House should be located at the converging point of all the recreation activities providing lockers, showers, and pro shop. Not only are the 1st, 9th, 10th, and 18th holes focused on this facility, but virtually all of the major recreational facilities including the Conference Center, Recreation Center, driving range, putting practice green, swimming pool and tennis courts would be located within its vicinity.

Parking - Due to the limited parking at the Conference Center, a main parking lot should be located between the Club House and Recreation Center. This will provide for joint use opportunities which could result in lower overall development costs.

Golf Course - This 18-hole golf course will be divided into two nine-hole executive courses. The first nine holes project across the expanded northern lake, will cross under the proposed Entry Boulevard along the periphery of
University Parkway. It will then cross under Outer Loop Road and touch the Inner Loop Road to provide the Technology Core with a recreational leisure window. The second nine holes will project over the southern lake along the southern border toward the edge of the sanitary sewer facility then turn along the Extension Use Cul-de-sac, Inner Loop Road, and portion of the Entry Boulevard back to the Club House. The driving range, putting practice green, existing swimming pool facility, and the proposed tennis courts would be surrounded by nine holes.

The Golf Course should be informally landscaped, particularly the edge along the Sewage Treatment Plant where planting must create an effective screen.

Lake - In addition to the existing southern lake and the expanded northern lake, one additional major lake is proposed for each nine-hole area. These would be multi-purpose lakes. Besides providing scenery and drainage detention and retention, they would provide recreation, function as irrigation reservoirs, and create driving hazards for golfers.

Levels in the three lakes will be controlled by fixed outfall elevations. The northern lake will drain via the golf course into the southern lake. Outfall from both lakes then flows into Thompson Creek.

The lake nearest the sewage treatment plant will outfall into an improved ditch along the southern most boundary to confluence with the sewage treatment outfall ditch. The two ditches empty into an unnamed ditch that flows to the Brazos River.

Outer Loop Road

The Outer Loop Road would ultimately provide secondary access to the Extension Use Area and Open Land Use Area. This road is designed as a free form curvi-linear alignment with variable width medians strategically located to create a park like image for the land uses it will connect. Plantings would be informal to reinforce the more informal character of this area of the Campus.

Extension Use Area

It is proposed to divide the Extension Use Area into two sections, one located near the Open Land Use Area and the other near the sewage treatment facility. The former is accessible from Outer Loop Road. The latter can be reached from the Extension Use Cul-de-sac. Housing for Extension Uses should be located at the intersection of the Inner Loop Road and Extension Use Cul-de-sac across the street from the second nine-hole golf course and new lake. The education and training activities should be located at the end of Extension Use Cul-de-sac since these facilities do not require a "frontage site", particularly the heavy equipment training. Buildings should be sited to flank the turn around at the Cul-de-sac to screen the view of field training. The landscape concept for Extension Use Area (South) should be densely planted in an informal pattern to provide the maximum buffering affect.
Warehouse Area

The existing warehouses are recommended to be preserved as long as feasible. These structures are unique for their simplicity of form. However, access to these facilities should be reversed to the north side of the buildings so that the image from Outer Loop Road can be easily controlled.

Service Center

The utility service for the Campus is proposed in two locations. Sewage treatment is to remain in its current location with heavy edge landscape buffering proposed along the golf course and Extension Use Cul-de-sac. Other utilities will also remain at their current location near the intersections of Extension Use Cul-de-sac and Inner Loop Road and Outer Loop Road. Their edges will also be properly screened with particular attention to the berming and landscaping along Inner Loop Road.

Areas for Future Expansion

The two major parcels located between Inner Loop Road and Outer Loop Road, approximately 32 acres each, should be reserved for future expansion. The one surrounded by the golf course, Entry Boulevard, Inner Loop Road, and Outer Loop Road should be reserved for high image building uses. The second area can be used for expansion of the Extension Uses or expansion of Technology Core parking should demand justify it, or even the expansion of the Technology Core itself in the event that currently unforeseen demand make it necessary to do so.

Vehicular access to these areas should be limited to the Outer Loop Road, Inner Loop Road, and the Inner/Outer Loop Connector Road in between the two Loop Roads. No access should be allowed from the Entry Boulevard. Buildings shall be oriented toward surrounding streets and/or open spaces, and shall be oriented to take advantage of views into the golf course.

For the parcel adjacent to the Water Plant, parking and/or open space uses shall be located at the area near the plant. Extension Use buildings shall be sited between roads and field activity areas to minimize undesirable visual impact from roads.

Firemen’s Training Center

While it is not recommended, there is space in the extreme western side of Riverside Campus in the Open Land Use Area for the relocation of the Firemen’s Training Center now located near Easterwood Airport. The present site occupies 70 acres; any future site should provide 100 or more acres. A number of locations should be studied before a relocation site is selected. Studies should include environmental impacts of the facility both upon University and private properties considering both near term and long term land use developments.
Apron Area and Green Belt

The Apron Area is primarily for industrial type testing and research activities. Therefore, screening with a 370-foot wide green belt zone will both provide a buffer to the Technology Core and an amenity to the Apron Area. Part of the green belt utilizes the largest grove of existing vegetation located between Avenue A and Avenue B. The Apron Area will be fenced and two controlled accesses will be provided for security reasons. A window should be provided through the green belt and the Apron Area to afford viewing of the dramatic testing and research conducted in the runway area. At the eastern side of the window adjacent to the Inner Loop Road is the proposed Science and Technology Interpretative Center which could contain displays highlighting current and past research, testing, and extension activities conducted on Riverside Campus. The Center would become the transition and interconnecting point between the Technology Core and the Apron Area. A parking lot should be located between the center and the viewing area. The two access roads and the visitor viewing area divided the area into four blocks. Buildings in this area should be converted into a larger more organized arrangement to create a sense of order and cohesiveness.

TRAFFIC CIRCULATION PLAN

The Campus will be developed such that the existing streets are utilized extensively during Phase I development. As the Plan progresses into Phases II and III development, the streets will be replaced with a more efficient loop system that connects to outer areas by cul-de-sacs. The traffic circulation system is presented on Exhibit No. 19.

The plan is based exclusively on the concept of a direct tie with the Main Campus via the proposed University Parkway. A direct connection with the freeway should consist of a "trumpet" type intersection which will provide an efficient link between the two Campuses.

It is anticipated that the land area between the Main and Riverside Campuses will probably be developed as University Parkway is completed. Therefore, to accommodate that proposed growth, the State Department of Highways and Public Transportation (SDHPT) might consider, through support of The Texas A&M University System, a diamond interchange located approximately one mile south of the Riverside Campus entrance.

Roadway Network

The proposed road system, Exhibit No. 19, will include a major entrance road, a four lane loop road, and minor arterial streets to provide access to outer perimeter areas of the Campus. All streets and roads shall be curb and gutter type with a storm sewer system to dispose of rainfall runoff.

The Entry Boulevard will connect University Parkway with Inner Loop Road which circles the Technology Core. The Entry Boulevard is a four lane divided roadway with a variable width median. The four lanes consist of two 12-foot lanes in each direction.
The Inner Loop Road is proposed as a 44-foot wide undivided roadway. The roadway consists of four 11-foot lanes with two way traffic. See Typical Road Sections, Exhibit No. 20.

The remaining streets, Apron Road, and connector streets, as well as the cul-de-sacs are 30-foot wide undivided roadways. These streets are two lane with two way traffic.

Ultimately, the Outer Loop Road will be constructed to access the perimeter areas of the Campus. It will be the same type of roadway as the Inner Loop Road and serve the far northern and eastern extremes of the Campus.

Traffic Circulation Plan - Phase I

The first phase includes development of the Entry Boulevard from University Parkway to existing Bryan Road. The Recreation Area Road and the Extension Use South Cul-de-sac are also proposed in Phase I.

It is anticipated that the main lanes of the University Parkway will be constructed during this phase. In addition, the trumpet intersection should be constructed by the SDHPT to provide the needed interconnect between the Main and Riverside Campuses.

Traffic Circulation Plan - Phase II

Improvements in Phase II, 1995 to the year 2000, will include construction of the Inner Loop Road, the Apron Road, and two interconnecting streets between the Inner Loop Road and Apron Road.

Traffic Circulation Plan - Phase III

The only improvements proposed during Phase III, 2000 to 2010, is the street to serve the Extension Use Area (North). This street will be constructed as a cul-de-sac initially, but as Outer Loop Road is constructed, the cul-de-sac will be eliminated. The street will then serve as a connector street between the Inner and Outer Loop Roads.

Parking

Except for the major parking area in the Technology Core, off-street parking is proposed to be provided as the individual building sites are developed. Street parking on the Entry Boulevard will be strictly prohibited.

Parking requirements for building sites will be determined at the rate of two spaces/1000 square feet of building floor space. These lots should be constructed simultaneously with building construction to ensure ample parking is available. Table 5 contains a summary of parking requirements in the Technology Core.
EXHIBIT 20
TYPICAL ROAD SECTIONS

A. ENTRY BOULEVARD

B. INNER LOOP ROAD

C. OUTER LOOP ROAD

D. CUL-DE-SAC/APRON ROAD

-59-
TABLE 5
TECHNOLOGY CORE AREA PARKING & CAPACITY

<table>
<thead>
<tr>
<th></th>
<th>PARKING SPACES</th>
<th>FLOOR SPACE CAPACITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHASE 1-3 SUBTOTAL</td>
<td>1,488</td>
<td>744,000 SF</td>
</tr>
<tr>
<td>PHASE 4 SUBTOTAL</td>
<td>2,218</td>
<td>1,109,000 SF</td>
</tr>
<tr>
<td>GRAND TOTAL</td>
<td>3,706</td>
<td>1,853,000 SF</td>
</tr>
</tbody>
</table>

Note: Parking demand was based on two space/1000 SF of building floor space
Source: Bovay Engineers, Inc.

Bus Routes

To increase access to the Riverside Campus an intercampus bus system should be
developed to provide bus service on a regular basis. A day time schedule
based on 20 minute intervals between Campuses is recommended.

OPEN SPACE PLAN

The Open Land Use Area provides the single largest amount of open space for
the Campus areas west and north of the runway, see Exhibit No. 21. While the
proposed 18-hole golf course and lakes represent the second largest open space,
these areas will be the most dominant open space elements due to their higher
quality image and visibility along the major roads. The green belts located
between the Technology Core and Apron Area, the Central Plaza, and the Entry
Road median are other major open space elements. Smaller open space setback
areas created for their landscape buffering effect exist along all the
streets; and the pedestrian corridors inside the Technology Core parking areas
form an integrated system of open space for the Campus.

FACILITY PLAN

Many of the existing buildings are inadequate and do not offer much opportunity for future use. Where possible, buildings in good condition will be
utilized in the phased plan development program. Not all buildings labeled as
"poor" will be demolished immediately. Those located in areas not programmed
for development until the later phases may be left intact until that particular area is scheduled for development.

In the Technology Core, it is recommended that demolition of those buildings
categorized as "poor" proceed immediately. This action will help clean up the
Core area of these eye sores and result in a more pleasing environment.
Based on a structural evaluation existing buildings were ranked into one of three categories. The classification and composition of each of these groupings is described in the following paragraphs.

Buildings - Excellent Condition

This group comprises the least number of buildings as very few have been added in the last 20 years. These buildings will be incorporated into the various development phases for continued use as appropriate.

The following buildings were classified as being in excellent condition and suitable for extended use.

Nos. 4430, 4431; Housing Buildings.
No. 6502; Engineering Test Lab, TEES Building.
Nos. 6880, 6881; Swimming Pool and Bath House.
Nos. 7041, 7042, 7043, 7044, 7048, USAD Buildings.
Nos. 7180, 7181, 7183, 7184; Food Protein R&D Center, TEES Buildings.
No. 7751; TTI, TEES, Law Enforcement & Security Training, TEEX Building.
No. 8000; Construction Equipment Training, TEEX Building.
No. 8004; Water and waste water training, TEEX Building.
No. 8561; Automotive Maintenance & Paint Shop.

Buildings - Good Condition

Buildings in this category are considered suitable for continued use only as long as they are not located in an area designated for early development. Those buildings in good condition located in the Technology Core are proposed for demolition as soon as practical. (Phase I).

The following buildings are identified as being in good condition and suitable for interim use.

No. 6030; Electric Power Utilities & Telecommunications Training, TEEX Building.
No. 6242; Wildlife & Fisheries Building.
No. 7046; Flight Mechanics Lab, Aerospace Building.
No. 7072; Mechanical Engineering - Gas Turbine Lab Building.
No. 7090, TTI Structural Research Lab.
No. 7092, TTI Field Maintenance Shop.
No. 7093; Research & Instrument Shop, TEES.
No. 7240; Food Services Cafeteria.
No. 7535; Physical Plant Offices.
Nos. 7800, 7801, 7802; Extension Center Housing.
No. 8031; TTI, Mechanical & Bioengineering.
No. 8236; Vocational Instructional Services, Agricultural Education.
No. 8510; TTI & TEES Engineering Test Lab & USDA Shop.
No. 8511; Texas Agriculture Extension Services Storage.
Nos. 8512, 8513; Extension Center Warehouses.
No. 8516; Oceanography Core Storage.
No. 8517, 8518, 8519, 8521; Extension Center Warehouses.
No. 8522; TAES Publication Operations Storage.
Buildings - Poor Condition

Buildings in this category were so rated for one or more of reasons. The buildings may be termite-infested, not structurally sound, or just in a state of dis-repair due to time and the elements. These buildings are considered "eye sores" and scheduled for demolition. They should be demolished as soon as funds are available and the current user can be given ample space in another location. Those buildings located in the Technology Core should be removed at the earliest possible opportunity to upgrade the aesthetics and image of the Riverside Campus.

No. 5499 Wash Rack, Vet Medicine
No. 6047 Oceanography Storage
No. 6060 Unassigned Buildings
No. 6069 Runway Lighting Control (Extension Center Facility)
No. 6071 Electronics Training, TEEX
No. 6095 TTI Paint & Storage
No. 6666 Vet Medicine
No. 6693 Health & Physical Education
No. 6775 Food Protein, TEES
No. 6882 Restroom (Extension Center Facility)
No. 7002 Law Enforcement & Security Training, TEEX
No. 7003 Texas Engineering Extension Service
No. 7006 Extension Center Conference Facility (old shaped building)
No. 7023 Extension Center Housing
No. 7056 Bioengineering, Mechanical, & Industrial Engineering
No. 7057 Bioengineering & Mechanical Engineering
No. 7061 Safety Education & TTI Driver Skill Development
No. 7063 TTI Driver Skill Development
No. 7064 Oceanography & Meteorology
No. 7065 Runway Lighting Control (Extension Center Facility)
No. 7077 Airway Control Tower (Extension Center Facility)
No. 7078 Aerospace Flight Mechanics Lab Storage
No. 7079 Thermodynamics
No. 7080 Biology
No. 7098 TEES & Dean of Engineering Storage
No. 7176 TEEX Publications
No. 7177 USDA & Environmental Engineering
No. 7178 Electronics Training TEEX
No. 7179 Mechanical Engineering & Agricultural Extension Service
No. 7500 TTI Research Pendulum Test
No. 7665 Vet Medicine Storage
No. 7674 Vet Medicine Storage
No. 7676 Vet Medicine & Geophysics Storage Volatiles
No. 7686 Vet Medicine Storage
No. 7687 Vet Medicine Storage
No. 7750 Unassigned
No. 7922 Restroom
No. 8001  Animal Science Storage  
No. 8002  Vet Medicine Storage  
No. 8006  Vet Medicine Storage  
No. 8007  Elec. Power Utilities & Telecommunications Training, TEEX  
No. 8081  Electronics Training, TEEX  
No. 8083  Electronics Training, TEEX  
No. 8175  TEEX Publications  
No. 8267  Electronics Training, TEEX  
No. 8473  Nautical Archaeology  
No. 8474  Nautical Archaeology  
No. 8475  Unassigned  
No. 8476  Law Enforcement & Security Training, TEEX  
No. 8483  Nautical Archaeology  
No. 8487  Physics Department  
No. 8488  Nautical Archaeology  
No. 8508  Extension Center Warehousing, Volatile Storage  
No. 8527  Restroom  
No. 8528  Extension Center Storage  
No. 8529  Extension Center Storage  
No. 8530  Extension Center Custodial Hdq. & Storage  
No. 8531  Wash Rack (Extension Center Facility)  
No. 8532  Extension Center Fire Station  
No. 8540  Extension Center Storage  
No. 8541  Extension Center Facility  
No. 8586  Extension Center Traffic Control & Information  
No. 8681  Law Enforcement & Security Training, TEEX Firing Range  
No. 8892  Vet Medicine Storage  
No. 8893  Vet Medicine Storage  
No. 8894  Vet Medicine Storage  
No. 8895  Vet Medicine Storage  
No. 8896  Vet Medicine Storage  
No. 8899  Vet Medicine Storage  
No. 7803  Skid Shack  
No. 7804  Skid Shack  
No. 7805  Skid Shack  
No. 7806  Skid Shack

Demolition Plan

The demolition schedule will follow the Capital Improvements Program phasing plan for the site as funds are available. The demolition program is proposed to create an open, clean area that will be pleasing to the users. Exhibit No. 22 contains the proposed Demolition Plan.

In Phase I, all structures should be cleared within the Entry Boulevard right-of-way, as well as the Recreation Area Road and the Extension Use Cul-de-sac. Additionally, any buildings classified as poor should be removed from the Recreation Area, Technology Core, and Extension Use Area (South).

Buildings classified as being in "good" condition could remain so long as they serve a suitable user purpose.
In Phase II, all buildings located within the Inner Loop Road and Apron Road rights-of-way are scheduled for removal. This includes all buildings regardless of condition so that road construction can proceed without major delays.

Buildings located inside the Inner Loop Road classified as poor that were not removed in Phase I should be removed during Phase II. Otherwise, the new development image will be marred by these obsolete structures.

Additionally, all structures within the green belt areas between the Apron Road and Inner Loop Road should be removed to allow landscaping to proceed.

The Extension Use Area (South) to be developed during Phase II will require site clearing, but only as needed and as funds are available. The buildings in poor condition should be removed first and those classified as being in good condition could remain until their usefulness is terminated.

Finally, as new buildings are constructed in the Apron Area and the Warehouse Area to the north, existing obsolete buildings should be removed.

In Phase III, as development approaches the planned level, a new survey should be made of all remaining buildings. Those that no longer serve a user should be removed. Those buildings in use should be removed as the user finds new space in more attractive buildings/surroundings.

The key to the proposed Demolition Plan is to remove structures prior to the planned use of the site and to improve the aesthetic character and desirability of the Campus.

**CAMPUS IMAGE AND IDENTITY**

It is the intent of the Texas A&M University to create at the Riverside Campus an environment that complements the total Texas A&M University System. The Riverside Campus provides an unusual opportunity to expand University services on many levels. Riverside will be the site of academic and applied science research projects that have unusual space, safety and security requirements. Both academic and extension departments will find high quality classroom, laboratory and research facilities as the Campus develops. The Campus will also house a new conference center, recreation areas and golf course.

It is the goal of the Texas A&M University that the Riverside Campus reach a stature equal to the older system Campuses within the next 20 years. Consequently, it is imperative that the development of the new Campus be strictly guided according to the precedents and restrictions already active on the other Campuses.

**General**

The Texas A&M University System has established a certain architectural vocabulary for Campus entries on the Main Campus and the Research Park. Because of the proximity between the three Campuses it is especially important to have the Riverside Campus share in existing Texas A&M University image and
identity. The architectural vocabulary of the entry should borrow heavily from the existing Campus entries yet have its own distinction. The following entry concept utilizes the same materials, colors, forms and modules found on the Main Campus organized in a style that is reminiscent of the federalist/institutional architecture found in the older buildings on the Main Campus. It is a modular design that can be implemented over time as the Campus grows.

Main Entry

The main Campus entry is located on the Entry Boulevard at the intersection of the Outer Loop Road and the Recreation Area Road. The entry features consist of a monument sign centered in the median west of the intersection. The sign will be approximately 5'-0" x 32'-0" built of natural stone with sandblasted letters. The letters will be colored for contrast with the stone. The sign will be lit at night from below by lights concealed below grade.

Landscape walls consisting of alternating modules of solid masonry walls and open tubular steel fencing similar in character to the landscape walls used on the main Campus further define the entry. The landscape walls and entry monument will create a "gateway" into the Campus and establish the relationship with the other University Campuses through the common architectural elements of layout, form and massing, color and materials. For details see accompanying Exhibit No. 23.

The typeface used on the sign wall will be the Texas A&M University standard, Helvetica, and building materials will be the buff/grey colors established on the Main Campus.

Secondary Entries

Secondary entries are those areas within the Campus that lead to discrete areas such as the Conference Center and Commons Building. As the Campus grows, additional entries may be required from SH 21. Any entry to the Campus except the main entry on University Parkway will be considered a secondary entry.

Secondary entries shall be designed using any combination of the elements established at the main entry.

Landscape/Security Wall

The landscape/security wall is the wall screening the Technology Core from the Apron Area. The wall is intended to provide limited and controlled visibility into the Apron Area while screening unsightly areas and limiting access to this high activity area.
The Signing Plan

The Signing Plan has been designed for the Riverside Campus to facilitate pedestrian and vehicular circulation within the Campus and to help ensure the visual quality of the environment by controlling and limiting the size, materials, and placement of signs. In developing the Signing Plan every effort was made to utilize the same sign types and structures as are currently in use on the Main Campus. Using the same sign types will provide a cost benefit from standardization and will tend to enhance the Riverside Campus as a part of the whole Texas A&M University System.

The Signage Guidelines contained in the Development Guidelines document describe all sign types allowed on the Riverside Campus. In addition to the Signage Guidelines all signing shall conform to University graphic and architectural standards. Traffic control and handicap signing will conform to all government requirements and standards having jurisdiction on the Campus.

The Signing Plan is divided into three phases based on the anticipated development of the Campus. The first phase contains the major elements of the signing plan: the entry features and landscape walls. These signs are integral to the development of the Campus image and identity and should be fully implemented in the earliest stages of development. However, if funding is not available for the entire graphics projects, the graphic elements are designed to be incrementally implemented. Directional signs, building identification signs and traffic control signing are also shown for the first phase of development, but the actual number of signs, sizes, locations and messages must be confirmed during Phase I Design. (See Exhibit No. 24 Signing and Fencing Plan.)

Signing for Phases II and III will be as required by new development and population increases.

It is recommended that the Texas A&M University coordinate with the Highway Department to have a sign on University Parkway.

UTILITIES AND DRAINAGE PLAN

This element of the Master Plan includes water, sanitary sewer, storm drainage, and electrical service. A brief discussion regarding a Campus central plant including hot and chilled water is also included. Analysis indicated that the existing water system is adequate to meet the initial demand to be created during Phase I development. The wastewater treatment system will have to be expanded during Phase I to be capable of handling additional population.

During Phase II, the majority of both systems will be replaced as the resident population increases and the demand exceeds the system capacities. Proposed building sites being located directly above existing water and sanitary sewers lines will necessitate their early replacement to avoid future of service. Overall the utilities plan is one of utilizing the existing system through Phase I as much as possible - major replacement in Phase II; and by Phase III,
the proposed utility replacement systems should be completed and in service. Only those parts of the systems serving the outer perimeter areas that will ultimately be developed beyond the year 2010 will not be in place.

Ultimate growth projections were used in sizing the utility lines so the systems capacities will be capable of serving the Campus beyond the year 2010.

Prior to actual construction, it is mandatory that more detailed preliminary engineering design be completed to verify the exact sizes and capacities required for all utilities and storm drainage system.

Water Distribution System

The present Campus water pumping station should prove adequate to meet projected needs beyond the year 2010. Water demand is based on 20 gallons of water per person per day for office buildings and 100 gallons of water per person per day for overnight accommodations. In addition to the basic demand for drinking and sanitary purposes, the water system will also be utilized for research and irrigation.

The Golf Course and landscaped areas shall be irrigated with water from three pump stations at the proposed lakes. During periods of low rainfall as levels in the lake drop, water from the distribution system will supplement lake water for irrigating.

The overriding criteria for the distribution system is that it be designed to provide a minimum residual pressure of 20 pounds per square inch under any and all conditions of demand that can be placed on the system. This includes expected fire flow as required by the Texas State Board of Insurance. Under normal conditions, a minimum pressure of 35 pounds per square inch must be maintained.

The system consists of an eight and 12-inch main loop that is located just inside the Inner Loop Road, encircling the Technology Core. An eight-inch loop will serve the Apron Area and Extension Use Area (South).

To serve the areas between Inner Loop Road and the University Parkway, an eight-inch main is proposed to be extended from the main loop east along the Entry Boulevard. A six-inch loop will service the Recreation Use Area while an eight-inch loop will be extended north along the future Outer Loop Road for the Future Technology Area. A six-inch loop system will also serve the future Extension Use Area near SH 21.

To provide a greater comprehension of the water distribution system plan, see Exhibit No. 25. It presents the ultimate system or all three phases within the developed area to complement the other Master Plan elements.

Water Distribution - Phase I - Three areas require service in this phase, the Recreational Use Area to the north, the Apron Road Area, and Extension Use Area (South).
The Recreational Use Area will be served by a new eight and six-inch main that is connected to the existing system at Avenue D and 6th Street. The eight-inch line will extend northward along the Entry Boulevard then reduce to six-inches and proceed south to the property line between the Recreational Use Area and the Golf Course. A six-inch main will serve the area without a loop during Phase I development.

The Extension Use Area (South) will be served by an eight-inch main that begins at the existing main located at Avenue D and 8th Street and follow the Cul-de-sac that extends into the area. It will terminate at the end of the street and will not be looped.

The Science and Technology Interpretive Center is located such that service may be obtained from the existing water lines. No new construction initially will be required for this area.

Water Distribution - Phase II - The Inner Loop Road main will be constructed at the same time the road is completed. Any existing buildings requiring service will be connected to the new main as the old system is replaced.

Water loop systems will be constructed at the Recreational Use Area and the Extension Use/Apron Areas. These systems will be six and eight inches in diameter respectively.

Water Distribution - Phase III - The final development of the water distribution system will include water line loops constructed to serve the Future Technology Area and the Extension Use Area (North).

The eight-inch main that temporarily dead ended at the intersection of Entry Road and the Recreation Area Road will be extended along the future Outer Loop Road right-of-way northward to the intersection with the Inner/Outer Loop Connector Road. A tee and reducers will decrease the size to a six-inch diameter.

The straight run branch of the tee will continue along the future Outer Loop Road right-of-way and connect with the main system just west of the water pumping station. The branch side of the above tee will extend south along the Inner/Outer Loop Connector Road. It will tie into the 12-inch main loop, completing the Campus water distribution system.

Wastewater System

As with the Water Distribution System, the wastewater system is proposed to be constructed in phases. Phase I development will be served by the existing collection system as much as possible. As the Campus enters into Phase II development, most of the existing lines will be replaced. At the completion of Phase III development (year 2010), all new lines will be installed.

The size of the existing sewage treatment facility will limit its ability for treating sewage to the early stages of Phase I only. During this phase, plans should begin for the design and construction of a permanent plant to be
capable of treating sewage beyond the year 2010. The new plant should be operational by 1991 or 1992, depending on how fast the Campus population grows.

The future wastewater collection system including treatment plant is illustrated on the Exhibit No. 26.

Wastewater System - Phase I - The Recreation Use Area will be served by a six-inch main that extends northward parallel to the Entry Boulevard and southeast along the property line between the Golf Course. The six-inch line will tie into the existing system behind the existing houses along Bryan Road between 6th and 7th Streets.

The location of the Science and Technology Interpretive Center over top of the existing sewer main serving the area north of 5th Street, will require the construction of a new main to maintain uninterrupted service to this area during Phase I development. The main will be sized for ultimate development. It will consist of six and 12-inch diameter sewer lines and will connect to the old line just south of 6th Street.

All other Phase I development will be served by the existing collection system.

The present sewage treatment facility, which consists of an Imhoff Tank and stabilization ponds, will continue in service during Phase I up to the point where the flow does not exceed its capacity of 50,000 gpd.

It is recommended that an existing sewage flow study be conducted to determine actual present day flow. With this information and development projections of population a determination can better be made as to when the Imhoff system capacity will be exceeded. This study procedure will facilitate the actual start of engineering the design. Based on current development projections, it is proposed that the new sewage treatment plant have a design capacity capable of processing an average flow of 300,000 gallons per day.

The new plant will require the update of the State discharge permit since the present permit is limited to a maximum discharge of 0.050 mgd. The application process should be developed consistent with plant design. Undesired delay could jeopardize the planned wastewater system development plan, which will impact overall Campus development.

Wastewater System - Phase II - This phase will include the expansion of the trunk line to the new treatment plant as well as the construction of two parallel lines through the Technology Core. The southern most line through the core will connect the Recreation Use Area line to the new system while the northern most line will eventually serve the Future Technology Area of between the Inner Loop Road and the back nine holes of the Golf Course. A six-inch line will extend this service line up the Inner/Outer Loop Connector Road to provide service for the Extension Use Area (North).
The Extension Housing located at the south end of the Inner Loop Road will be completed during Phase II development; therefore a six-inch sewer line extending to the main will be required, to collect.

Wastewater System - Phase III - The only construction proposed during Phase III development are the extension of the sewer lines that serve the Technology Area and the northern most areas of the Extension Use Area (North).

The sewer line serving the Future Technology Area will follow a route parallel to the Golf Course property line; and be six-inches in size.

The sewer line to the Extension Use Area (North) will also be six-inches in size and located along the north property line.

Additional branches within the Technology Core will be provided as development warrants. Scheduling is summarized in the Capital Improvements Program section of this report.

Storm Drainage System

The storm drainage plan consists of an efficient storm sewer system to carry storm water run-off from streets and sites, as well as a series of lakes to hold run-off and minimize flooding and be capable of providing irrigation of the Golf Course. A drainage ditch will also be needed to carry outfall from the Apron Road Area into the Brazos River within University Parkway. This ditch will also help alleviate excess water into the existing stream that presently drains the Campus. An alignment of the drainage ditch along and within the southern boundary of the site is recommended. This alignment will not require purchase of right-of-way from adjacent land owners.

Growth of the Campus should be monitored closely with regard to drainage. By installing an efficient storm sewer system, down stream effects will be increased, both in terms of the amount of runoff and the timing of the peak run-off. It is anticipated that the existing stream that receives the present storm run-off will not be adequate to accommodate future developed flows. Therefore it was planned to detain the runoff in the lake system releasing only an amount that the stream can handle. If a flood analysis concludes that additional detention volume is required then a site at the southern most section next to the Brazos River is recommended.

Storm sewers range in size from 24-inches in diameter to four by eight foot box sewers. The drainage system includes ditches, drop structures, manholes, curb inlets, and related appurtenances necessary for a complete system.

Details of the Storm Drainage Plan are contained on the Exhibit No. 27.

Design Criteria - To properly drain streets and adjacent property, storm sewers were designed to meet SDHPT criteria for a five-year event storm. Sewer line slopes are such that the velocities are a minimum of three feet per second (fps) and a maximum of ten fps. Curb inlets are located to intercept street flow and to alleviate street ponding.
The storm sewer system will provide stub outs at various manholes to permit connection of on-site drainage systems.

Lakes within the golf course should be sized such that the 25-year rainfall event can be accommodated for developed conditions. The golf course should be graded to permit extreme runoff to flow from the north lake to the middle lake. The dam on the middle lake should be designed to assure that it is adequate to pond additional water. Overflow from the three lakes will be limited to an amount equal to the undeveloped flow for the site. The required storm event for both detention and outfall will be determined during the engineering phase.

Drainage System - Phase I - The Phase I improvements will include the construction of the storm sewer to drain the Entry Boulevard, the Recreation Area Road and the Extension Use Area (South) Cul-de-sac.

The proposed drainage ditch from the outfall of the Apron Road sewer to the Brazos River should also be constructed during Phase I. The ditch will be constructed with three to one side slope walls and a bottom six feet wide. The ditch will be constructed to allow future widening beyond the year 2010 if needed. At the river, a drop structure will be constructed to eliminate the problem of the sharp drop off at the river bank.

Drainage System - Phase II - The bulk of the drainage system is proposed to be constructed during Phase II development.

The Inner Loop Road system will be constructed, as will the remainder of the Apron Road system and associated ditches and outfall structures.

Drainage System - Phase III - The only storm sewer improvements proposed during this phase will be that associated with the Outer Loop Road on the far north east side of the Campus. The storm sewer line will outfall into the northern most lake.

The two lakes located on the first nine holes of the Golf Course will be constructed. The Golf Course will be graded to direct drainage to these lakes rather than to the streets.

The second nine holes of the Golf Course will be constructed during this phase as will the third lake. The Golf Course should be graded to drain toward the lake to prevent sheet flow from entering developed sites or streets.

Natural Gas

Natural gas will continue to be supplied by the existing four-inch main owned by Lone Star Gas Company. The Campus will require a revised system as specific sites are developed and the existing system is destroyed or replaced.

The Campus administration will have to coordinate the installation of the new gaslines with Lone Star as shown on the proposed Gas Distribution Plan, Exhibit No. 28. Such coordination will help assure that properly sized lines are provided and installed consistent with Master Plan recommendations.
Electrical System

The electrical distribution system for the Riverside Campus will be entirely underground. A ductbank and manhole system will distribute power at 12.5 Kv to pad-mounted transformers at each building or facility. A nearby, but separate, ductbank and handhole system will distribute the telecommunication system cables. Ducts will be provided for metallic and fiber optic cables, as well as spares for future expansion.

Since the Campus will be developed in phases during which the existing active facilities will be dismantled, the power and communication systems will have to be planned and scheduled carefully to minimize interruptions in service. In some cases, temporary overhead service may have to be provided while underground service is completed.

The primary electrical system for the existing facilities is provided by the City of Bryan through an overhead 12.5 Kv feeder from a 6000 Kva substation located north of SH 21 and just east of the Campus site. This substation also supplies power to other users in the area. As the Campus develops and the load increases, it will be necessary for the City to increase the capacity of this substation. Also, to assure reliability of service, a second primary power feeder should be installed. Coordination between the University and the City of Bryan is mandatory to assure adequate electrical capacity for the Campus.

The proposed electrical distribution system and lighting systems plans will also be phased and are illustrated on Exhibit No. 29.

Electrical System Phase I - A new point of service will be established at a new manhole south of the existing security station. From there a new underground ductbank will be installed to the new Switching Center Building at the utility center. From the Switching Center, ductbanks will be installed along existing Avenue A and Bryan Road with a connecting ductbank along 6th Street.

From these three main ductbanks, branches will be installed to the various buildings and facilities proposed for construction during Phase I. Manholes will be strategically located for tie-ins during phases.

At some point during Phase I development, the load will have increased to the level that arrangements will have to be made with the City of Bryan for increased service capacity. A second feeder will be installed from the point of service to the Switching Center. Portions of the existing overhead power system will remain in service to supply existing facilities until they are either dismantled or can be supplied by the new underground system. Sections of the overhead system will be dismantled as they become inactive.

Electrical System - Phase II - Branches will be installed from the manholes installed during Phase I to the various buildings and facilities proposed in Phase II. A ductbank will be installed around the southern portion of the loop. This will complete the electrical feeder loop.
Electrical System - Phase III - Branches will be installed to the various buildings and facilities proposed in Phase III. The remaining portions of the overhead distribution system will be dismantled.

Lighting

All streets, pedestrian walkways, and parking lots will have lighting planned together with the landscaping and building design for safety, security, aesthetics and economics. The system will also be installed in phases, together with the power system and the other utilities.

The medium recommended for all application is high intensity discharge (HID). This type is currently the best available in terms of energy efficiency, visibility and low maintenance requirements. The accompanying Table 6 presents recommended luminaire types and average illumination level (in foot-candles) for the various applications.

Telecommunications

The plan proposes underground ducts for commercial telephone cables, either metallic or fiber optic type. Spare ducts will be provided for future expansion of the system, the addition of computer network cables, or the addition of fire alarm/security system cables. A 600 SF room will be included in the Switching Center Building for a telecommunications center.

Central Plant

The provision of centralized chilled water and/or steam should be more closely investigated as development warrants. The concentration of buildings and building sites in the Technology Core make it a possible candidate for a centralized heating and cooling system. The Technology Core covers an approximate 135 gross acre area with sufficient building density to warrant central plant consideration. According to the building phasing plan, 1.5 million SF of building space is required during plan development. Of this 1.5 million SF, 1.34 million SF includes new construction. Of the approximately 465,000 SF proposed in Phase I, 175,000 SF are located in the Technology Core. Of the 415,000 SF proposed Phase II, 115,000 SF are located on the Core, and 160,000 SF of the 461,000 SF of new buildings proposed in Phase III are located in the Core. This represents an approximate equalized 1/3 phased building construction program during the 22 year planning period.

If the Building Phasing Plan and the Capital Improvements Program are implemented as proposed, it may be feasible to develop a central plant with chillers and steam boilers programmed to come on line to serve the needs of the new buildings in the Core. Feasibility is beyond the scope of this Master Plan project but is certainly worthy of consideration at some time in the future.

One alternate method of providing service would involve the separate heating and cooling of the individual buildings as they are constructed in the Core. A second method could involve the location of a central plant in one of the buildings to the north or south of the central plaza. Feasibility of a
central plant in the Technology Core could occur at such point in time when 500,000 SF of new floor space is added in a contiguous area. Until a demand of 2000 tons of air conditioning is generated, a central plant approach would be unfeasible in the Core.

Hot and chilled water lines that supplement a central plant distribution system can be located in the natural gas or other utility system corridors.

### TABLE 6
**RECOMMENDED LIGHTING STANDARDS**

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>LUMINAIRE TYPE (3)</th>
<th>AVERAGE FOOTCANDLES (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Streets</td>
<td>MH</td>
<td>1.4</td>
</tr>
<tr>
<td>Minor Streets</td>
<td>MH</td>
<td>1.2</td>
</tr>
<tr>
<td>Service Drives</td>
<td>MH</td>
<td>0.9</td>
</tr>
<tr>
<td>Pedestrian Ways (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type A - Sidewalks</td>
<td>MH</td>
<td>0.9</td>
</tr>
<tr>
<td>Type B - Walkways-Central Mall</td>
<td>MH</td>
<td>0.5</td>
</tr>
<tr>
<td>Parking Lots</td>
<td>MH</td>
<td>1.0 - 2.0</td>
</tr>
<tr>
<td>Special Areas (2)</td>
<td>HID or Special Lighting</td>
<td>20.0 (Max.)</td>
</tr>
</tbody>
</table>

**Source:** Bovay Engineers, Inc.

**Notes**

1. Includes walkways, biking and jogging trails.
2. Includes signage, decorative and accent lighting for building exteriors and sculptures.
3. MH = Metal Halide; HPS = High Pressure Sodium; HID = High Intensity Discharge (includes HPS, MH, and MV).
4. Average maintained on the horizontal based on minimum levels recommended by the Illuminating Engineering Society of North America (IES).
Solid Waste

Solid wastes on the Main Campus and Research Park are currently collected by University personnel and dumped at the College Station landfill. It is proposed that the solid waste generated at Riverside Campus be also collected by University personnel and dumped at the College Station landfill.

FIRE PROTECTION PLAN

A comprehensive fire protection plan includes a number of measures to reduce the threat of fire and actual damage to life and property. These measures include inspections, fireproof construction, sprinkler systems, alarm systems, adequate water supply, and professional fire personnel and equipment. Some of the elements of the fire protection plan are already in place and others will be made available during new construction.

At the present time and for a number of years the existing wood buildings will necessitate frequent inspections by trained personnel to reduce any possible fire hazards to a minimum. Existing buildings should have smoke detectors, fire extinguishers and fire hose stations to facilitate early response to a fire while the fire personnel and equipment are on the way.

New construction on the Riverside Campus should be fully fireproofed in compliance with OSHA and NFPA standard codes and safety provisions. Sprinkler systems should be installed in all new buildings on the Campus. Adequate fire hose and fire extinguisher stations should be provided in all buildings. The Hawkeye warning system now in use on the Main Campus should be extended to the buildings on Riverside Campus.

To provide for professional response for fire emergencies on a 24-hour basis there should be a contract with the City of Bryan for the provision of fire protective services. Bryan now offers the closest full time fire department.

In the future as the urban area surrounding the City of Bryan grows there will probably be substations located closer to the Riverside Campus. Because the response time would be somewhat longer than ideal, maximum use should be made of the early, on-site measures discussed above. It might also be desirable to continue the volunteer fire station on the Riverside Campus. The nearby County Volunteer Fire District which can further augment fire protection facilities should also be coordinated into a mutual fire protection part with the City of Bryan.

The quantity and pressure of water is adequate for present and future developments, however some of the fire hydrants are reportedly serviced by four-inch water lines. These should be upgraded to six-inch lines. This program should also occur as part of the water supply system improvement program.

The elevated tank has a capacity of 500,000 gallons with a high water level approximately 135' - 0" above ground. The tank should be maintained at the high elevation level through proper operational practices as much as possible. By doing so, adequate water will be available in case of a fire.
The current Key Rate Schedule published by the Texas State Board of Insurance defines the amount of fire flow required for specific types of areas.

The schedule requires 3000 gpm flow for Principal mercantile/industrial areas and 1500 gpm for light industrial areas. The elevated tank could support a 3000 gpm fire flow for 2.8 hours and a 1500 gpm fire flow for 5.5 hours.

SECURITY AND FENCING PLAN

The Riverside Campus should be provided protection at the same level service as the Main Campus by the Texas A&M University Department of Security and Traffic. The police services would include a full time patrol on the Riverside Campus supported by a Riverside Campus Police Substation adequately staffed on the basis of a 24-hour-day, seven-day-week. Campus police presence will tend to discourage crimes against persons and property and provide a feeling of security for the employees, students and visitors on the Riverside Campus at all hours. The provision of appropriate traffic control signs and devices with the police patrol will provide traffic safety now lacking on the Riverside Campus.

Recommended fencing is shown on Exhibit 24. The Open Land Use Area is enclosed with an agricultural type barbed wire fence. This barbed wire is also used for the entire perimeter of the Riverside Campus.

An opaque fence is recommended along the eastern boundary of the Apron Area, screening the Apron Areas from the Technology Core. This fencing will have two magnetic-card control type gates as shown on the Exhibit. This access control will prevent the entry of unauthorized personnel from gaining access to the shops and open test areas which may be hazardous. The control of access will also help to provide the security for classified research projects which may be underway.

Chain link fencing is provided for the Extension Use Areas, the Utility/Service Area, the Sewage Treatment Plant site, and some areas to the north and the south of the Apron Area to prevent entry by unauthorized personnel.

The Technology Core, the Recreation Use Areas and the Conference Center would not be fenced but would be secured on a building by building basis.
IMPLEMENTATION PLAN

The Master Plan for Riverside Campus presents an exciting vision of the future for the Campus. The implementation of the Plan will require the phasing of the numerous improvements over a long period. Capable and effective Campus management will be facing continuous change as the future unfolds. During the lengthy period of implementation there will be need for flexibility while adhering to the spirit of the Master Plan. This chapter presents a Phasing Plan and a Management Plan which together make up the Implementation Plan.

There is currently no Texas A&M University program for the expansion of Riverside Campus. The Phasing Plan presented in this chapter does list improvements in a coordinated program of short, middle and long range phased development. The program has been prepared to reflect the needs and wishes of the agencies, organizations and departments which will be looking to Riverside Campus for locations for their activities. Significant amount of front end development expenses in landscape, infrastructure expense are programmed to seek a much needed change of Campus image to create an attractive environment. This is a necessary approach to change the perception of agencies, organizations, and departments that will look at Riverside Campus as a potential location for some of their activities. While based upon a number of assumptions regarding building and land needs, the Phasing Plan is a good base for the implementation of a detailed development program. A general program is presented in the succeeding Capital Improvements Program.

PHASING PLAN

The Phasing Plan lists improvements by primary categories with designation of the phased construction of short range (1988-1995), middle range (1995-2000) and long range (2000-2010) including an estimated cost of construction. The phasing of these improvements has taken into account the interrelatedness of these improvements; the timing of construction may be faster or slower than that shown in the Plan.

In the absence of a definitive Campus development program setting forth which agencies, organizations and departments will need how much space and when, a building construction phasing plan has been prepared based on the interviews conducted earlier in this study and a number of other assumptions. To support the building construction program, a separate capital improvements program was prepared in which such improvements as landscaping and the infrastructure were included. The capital improvements program reflects development phasing and complements the building phasing plan.

Building Phasing Plan

The Building Phasing Plan is based upon a projected level of development for Riverside Campus of 1,500,000 SF as estimated in Table No. 2 of this study. Of the proposed 1,500,000 SF, 1,341,000 SF involves new construction (454,000 SF in replacement floor space and 887,000 SF in new floor space) and of 59,000 SF in floor space which was existing in 1988 and is considered in satisfactory condition to be retained for use through the year 2010 and beyond. Of the 159,000 SF retained, 117,000 SF is located within the Technological Core, 37,000 SF in the Apron Area and 5,000 SF within the Utility/Service Area.
### Table 7

**Building Phasing Plan**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Building Type</th>
<th>Area (SF)</th>
<th>Cost (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short Range Phase (1988-1995)</strong></td>
<td>Commons Building</td>
<td>75,000</td>
<td>$90/SF</td>
</tr>
<tr>
<td></td>
<td>Recreation Center</td>
<td>40,000</td>
<td>$90/SF</td>
</tr>
<tr>
<td></td>
<td>Conference Center</td>
<td>50,000</td>
<td>$90/SF</td>
</tr>
<tr>
<td></td>
<td>Utility/Service Building</td>
<td>5,000</td>
<td>$60/SF</td>
</tr>
<tr>
<td></td>
<td>Technology Core Building</td>
<td>100,000</td>
<td>$90/SF</td>
</tr>
<tr>
<td></td>
<td>Science and Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interpretive Center</td>
<td>50,000</td>
<td>$90/SF</td>
</tr>
<tr>
<td></td>
<td>Apron Area Buildings</td>
<td>100,000</td>
<td>$60/SF</td>
</tr>
<tr>
<td></td>
<td>Extension Use Buildings</td>
<td>30,000</td>
<td>$60/SF</td>
</tr>
<tr>
<td></td>
<td>Open Land Use Buildings</td>
<td>5,000</td>
<td>$50/SF</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>455,000</td>
<td></td>
</tr>
<tr>
<td><strong>Middle Range Phase (1995-2000)</strong></td>
<td>Technology Core Buildings</td>
<td>150,000</td>
<td>$90/SF</td>
</tr>
<tr>
<td></td>
<td>Apron Area Buildings</td>
<td>150,000</td>
<td>$60/SF</td>
</tr>
<tr>
<td></td>
<td>Extension Use Buildings</td>
<td>40,000</td>
<td>$60/SF</td>
</tr>
<tr>
<td></td>
<td>Extension Housing</td>
<td>50,000</td>
<td>$90/SF</td>
</tr>
<tr>
<td></td>
<td>Open Land Use Buildings</td>
<td>25,000</td>
<td>$50/SF</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>415,000</td>
<td></td>
</tr>
<tr>
<td><strong>Long Range Phase (2000-2010)</strong></td>
<td>Technology Core Buildings</td>
<td>161,000</td>
<td>$90/SF</td>
</tr>
<tr>
<td></td>
<td>Apron Area Buildings</td>
<td>150,000</td>
<td>$60/SF</td>
</tr>
<tr>
<td></td>
<td>Extension Use Buildings</td>
<td>30,000</td>
<td>$60/SF</td>
</tr>
<tr>
<td></td>
<td>Warehouse and Buildings</td>
<td>100,000</td>
<td>$50/SF</td>
</tr>
<tr>
<td></td>
<td>Open Land Use Buildings</td>
<td>20,000</td>
<td>$50/SF</td>
</tr>
<tr>
<td></td>
<td>Golf Club House*</td>
<td>10,000</td>
<td>$60/SF</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>471,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Grand Total</strong></td>
<td>1,341,000</td>
<td></td>
</tr>
</tbody>
</table>

Source: Bovay Engineers, Inc.

* The Golf Club House might be built with private funds through privatization of the golf course operations.

The new construction has been scheduled into a short range phase (1988-1995), a middle range phase (1995-2000), and a long range phase (2000-2010). In the short range phase priority for construction has been given to common facilities and amenities; however, a sizable amount of new construction has been allocated to the replacement of the old wood buildings to benefit most of the current holders of space on the Campus. This prioritization recognizes
the importance of an early change in the image for Riverside Campus and providing new, modern building space for the agencies, organizations and departments now based on the Campus.

New construction of buildings in the middle and long range phases continues a balanced allocation of new buildings to the user groups now on the Campus and new user groups. It is emphasized that the projected level of floor space on Riverside Campus for the year 2010 is an estimate and subject to revision as program needs come into focus, and as preliminary design studies are authorized for individual building projects.

The Building Phasing Plan based on the above assumptions is set forth in Table No. 7. It should be noted that the cost estimates for the buildings are order of magnitude and will change during the preliminary design studies of individual projects. Other costs such as architectural and engineering fees and furnishings could add 25 to 30% more to the stated cost estimates. The cost estimates are in current dollars and may vary widely when future inflation is considered.

As explained the Buildings Phasing Plan forms the basis for preparing the Phasing of the other capital improvements proposed in the Master Plan. These individual Phasing Plans have been discussed in the various elements of the Master Plan. The detailed phasing of the landscaping, streets and roads, parking areas, utilities and drainage capital improvements are discussed in the succeeding paragraphs.

CAPITAL IMPROVEMENTS PROGRAM

Essential to the major undertaking of the almost complete building of a new Campus out of the existing Riverside Campus is the implementation of a series of capital improvements by phases (short term, medium range and long range).

The phasing, the listing of the identified improvements, and the cost estimate in 1988 dollars make up the Capital Improvement Program as shown on Table 8. This general program can form the basis for developing a Five-Year Capital Improvements Program which with annual revisions can yield a continuous five year guide to improvements for the orderly development of the Riverside Campus Master Plan. The general Capital Improvement Program presents a coordinated development program which provides for the coordination of the demolition of old buildings and the construction of new buildings and infrastructure.

Maintenance Concerns

While not a part of the Capital Improvement Program, maintenance costs for Riverside Campus will be sizable requiring major annual funding even during the early phases, if the goals of developing Riverside Campus are to be achieved. The Riverside Campus in developed area is comparable to the Main Campus; maintenance costs may well be comparable.
Ultimate Development Phase

The potential for development of the Riverside Campus Master Plan goes beyond the 1,500,000 SF of buildings and 6,000 daytime population estimated for the year 2010. Table No. 9 indicates an estimated ultimate development level of 3,947,000 SF of floor space for Riverside Campus; and a daytime population level of 15,200 based on the assumptions listed in the table. Riverside Campus may be viewed as being less than half developed to its full potential in the year 2010. The Master Plan and the Implementation Plan provide for the orderly expansion of Riverside Campus with each stage of development being an attractive, well balanced Campus in appearance, form and function.
<table>
<thead>
<tr>
<th>PHASE I - SHORT TERM (1988-1995)</th>
<th>COST</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. CONFERENCE CENTER (Landscaping)</td>
<td>$95,000</td>
<td></td>
</tr>
<tr>
<td>RECREATION CENTER (Landscaping)</td>
<td>$80,000</td>
<td></td>
</tr>
<tr>
<td>PARKING (Landscaping)</td>
<td>$145,000</td>
<td></td>
</tr>
<tr>
<td>RECREATION AREA ROAD (Landscaping)</td>
<td>$120,000</td>
<td>$440,000</td>
</tr>
<tr>
<td>SUB-TOTAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. ENTRY ROAD (Landscaping)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WILD FLOWERS</td>
<td>$65,000</td>
<td></td>
</tr>
<tr>
<td>TREES</td>
<td>$330,000</td>
<td>$395,000</td>
</tr>
<tr>
<td>SUB-TOTAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. PLAZA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TREES</td>
<td>$110,000</td>
<td></td>
</tr>
<tr>
<td>TURF</td>
<td>$35,000</td>
<td></td>
</tr>
<tr>
<td>WALKWAY</td>
<td>$50,000</td>
<td></td>
</tr>
<tr>
<td>IRRIGATION</td>
<td>$95,000</td>
<td></td>
</tr>
<tr>
<td>SUB-TOTAL</td>
<td></td>
<td>$290,000</td>
</tr>
<tr>
<td>D. SCIENCE AND TECHNOLOGY INTERPRETIVE CENTER (Landscaping)</td>
<td>$395,000</td>
<td></td>
</tr>
<tr>
<td>E. PARKING (Landscaping)</td>
<td></td>
<td>$145,000</td>
</tr>
<tr>
<td>F. NEW GREEN BELT</td>
<td></td>
<td>$265,000</td>
</tr>
<tr>
<td>G. EXTENSION USE CUL-DE-SAC (Landscaping)</td>
<td>$70,000</td>
<td></td>
</tr>
<tr>
<td>H. EXTENSION USE AREA (SOUTH)</td>
<td></td>
<td>$95,000</td>
</tr>
<tr>
<td>I. APRON AREA</td>
<td></td>
<td>$240,000</td>
</tr>
<tr>
<td>J. RUNWAY SCREENING (Transplant)</td>
<td></td>
<td>$200,000</td>
</tr>
<tr>
<td>PHASE 1 TOTAL LANDSCAPING/GOLF COURSE &amp; LAKES</td>
<td>$2,535,000</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE NO. 8
CAPITAL IMPROVEMENTS PROGRAM (CONT’D)


<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. STREETS, ROADS &amp; PARKING</td>
<td></td>
</tr>
<tr>
<td>A. TRUMPET INTERCHANGE</td>
<td>$460,000</td>
</tr>
<tr>
<td>B. ENTRY ROAD</td>
<td>$130,000</td>
</tr>
<tr>
<td>C. RECREATION AREA ROAD</td>
<td>$130,000</td>
</tr>
<tr>
<td>D. EXTENSION USE CUL-DE-SAC</td>
<td>$710,000</td>
</tr>
<tr>
<td><strong>SUBTOTAL</strong></td>
<td><strong>$1,430,000</strong></td>
</tr>
<tr>
<td>3. STORM DRAINAGE</td>
<td></td>
</tr>
<tr>
<td>A. ENTRY ROAD</td>
<td>$200,000</td>
</tr>
<tr>
<td>B. RECREATION AREA ROAD</td>
<td>$50,000</td>
</tr>
<tr>
<td>C. EXTENSION USE CUL-DE-SAC</td>
<td>$95,000</td>
</tr>
<tr>
<td>D. DRAINAGE DITCH TO BRAZOS RIVER, IMPROVEMENT DAM AND EROSION STRUCTURE</td>
<td>$220,000</td>
</tr>
<tr>
<td>E. IRRIGATION PUMPS AT LAKES A&amp;B</td>
<td>$10,000</td>
</tr>
<tr>
<td><strong>SUBTOTAL</strong></td>
<td><strong>$575,000</strong></td>
</tr>
<tr>
<td>4. WATER DISTRIBUTION SYSTEM</td>
<td></td>
</tr>
<tr>
<td>A. 6 &amp; 8-INCH LINES TO RECREATION USE AREA</td>
<td>$40,000</td>
</tr>
<tr>
<td>B. 8-INCH LINE TO EXTENSION USE AREA (SOUTH)</td>
<td>$40,000</td>
</tr>
<tr>
<td><strong>SUBTOTAL</strong></td>
<td><strong>$80,000</strong></td>
</tr>
<tr>
<td>5. WASTEWATER COLLECTION SYSTEM</td>
<td></td>
</tr>
<tr>
<td>A. NEW SEWAGE TREATMENT PLANT (300,000 GPM)</td>
<td>$630,000</td>
</tr>
<tr>
<td>B. 6-INCH LINE TO RECREATION USE AREA</td>
<td>$20,000</td>
</tr>
<tr>
<td>C. 6, 10 AND 12-INCH LINES TO EXTENSION USE AREA (NORTH)</td>
<td>$60,000</td>
</tr>
<tr>
<td>D. 15-INCH LINE TO EXTENSION USE AREA (SOUTH)</td>
<td>$25,000</td>
</tr>
<tr>
<td><strong>SUBTOTAL</strong></td>
<td><strong>$735,000</strong></td>
</tr>
<tr>
<td>6. ELECTRICITY SYSTEM</td>
<td></td>
</tr>
<tr>
<td>A. ELECTRICAL DISTRIBUTION</td>
<td>$1,350,000</td>
</tr>
<tr>
<td>B. LIGHTING (STREETS, PARKING, AND AREA)</td>
<td>$550,000</td>
</tr>
<tr>
<td>C. TELECOMMUNICATION</td>
<td>$500,000</td>
</tr>
<tr>
<td>D. DEMOLITION OF PRESENT SYSTEM</td>
<td>$100,000</td>
</tr>
<tr>
<td><strong>SUBTOTAL</strong></td>
<td><strong>$2,500,000</strong></td>
</tr>
<tr>
<td>TABLE NO. 8</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td></td>
</tr>
<tr>
<td>CAPITAL IMPROVEMENTS PROGRAM (CONT’D)</td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th></th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. NATURAL GAS (DISTRIBUTION SYSTEM-LONE STAR)</td>
<td>$25,000</td>
</tr>
<tr>
<td>8. DEMOLITION</td>
<td>$310,000</td>
</tr>
</tbody>
</table>

**GRAND TOTAL PHASE I INFRASTRUCTURE**

<table>
<thead>
<tr>
<th></th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$8,190,000</td>
</tr>
</tbody>
</table>


**1. LANDSCAPING**

<table>
<thead>
<tr>
<th></th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. TENNIS COURT (Landscaping)</td>
<td>$330,000</td>
</tr>
<tr>
<td>B. INNER LOOP ROAD (Landscaping)</td>
<td>$800,000</td>
</tr>
<tr>
<td>C. PARKING AREAS (Landscaping)</td>
<td>$900,000</td>
</tr>
<tr>
<td>D. OUTER LOOP ROAD (Landscaping)</td>
<td>$345,000</td>
</tr>
<tr>
<td>E. EXTENSION USE AREA (NORTH) UTILITIES SERVICE AREA SCREEN</td>
<td>$25,000</td>
</tr>
<tr>
<td>F. NEW GREEN BELTS</td>
<td>$400,000</td>
</tr>
<tr>
<td>G. EXTENSION USE AREA (NORTH)</td>
<td>$95,000</td>
</tr>
<tr>
<td>H. APRON AREA (Landscaping)</td>
<td>$360,000</td>
</tr>
</tbody>
</table>

**PHASE II TOTAL LANDSCAPING/GOLF COURSE & LAKES**

<table>
<thead>
<tr>
<th></th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$3,255,000</td>
</tr>
</tbody>
</table>

**2. STREETS, ROADS & PARKING**

<table>
<thead>
<tr>
<th></th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. INNER LOOP ROAD</td>
<td>$875,000</td>
</tr>
<tr>
<td>B. APRON AREA ROAD</td>
<td>$435,000</td>
</tr>
<tr>
<td>C. PARKING</td>
<td>$701,000</td>
</tr>
</tbody>
</table>

**SUBTOTAL**

<table>
<thead>
<tr>
<th></th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$2,011,000</td>
</tr>
</tbody>
</table>

**3. STORM DRAINAGE**

<table>
<thead>
<tr>
<th></th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. INNER LOOP ROAD</td>
<td>$425,000</td>
</tr>
<tr>
<td>B. APRON AREA ROAD</td>
<td>$1,325,000</td>
</tr>
<tr>
<td>C. IRRIGATION PUMP AT LAKE C</td>
<td>$5,000</td>
</tr>
</tbody>
</table>

**SUBTOTAL**

<table>
<thead>
<tr>
<th></th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$1,755,000</td>
</tr>
</tbody>
</table>
### TABLE NO. 8
CAPITAL IMPROVEMENTS PROGRAM (CONT'D)

#### PHASE II - MEDIUM RANGE (1996-2000)

4. WATER DISTRIBUTION SYSTEM
   - A. 12 & 8-INCH LINES ON INNER LOOP ROAD $200,000
   - B. 8-INCH LINES ON APRON AREA ROAD $75,000
   - C. 8-INCH LINES ON EXTENSION USE AREA (SOUTH) $40,000
   - D. 6 & 8-INCH LINES IN RECREATIONAL USE AREA $55,000
   **SUBTOTAL** $370,000

5. WASTEWATER COLLECTION SYSTEM
   - A. 6, 8 & 10-INCH LINES TECHNOLOGY CORE $35,000
   - B. 6-INCH LINE FOR EXTENSION HOUSING AREA $15,000
   - C. 12 & 15-INCH TRUNK LINE TO STP $80,000
   **SUBTOTAL** $130,000

6. ELECTRICITY SYSTEM
   - A. ELECTRICAL DISTRIBUTION $275,000
   - B. LIGHTING (STREETS, PARKING & AREA) $325,000
   - C. TELECOMMUNICATIONS $150,000
   - D. DEMOLITION OF PRESENT SYSTEM $100,000
   **SUBTOTAL** $850,000

7. NATURAL GAS (DISTRIBUTION SYSTEM - LONE STAR) $65,000

8. DEMOLITION
   **GRAND TOTAL PHASE II INFRASTRUCTURE** $495,000

#### PHASE III - LONG RANGE (2000-2010)

1. LANDSCAPING
   - A. EXTENSION SERVICE AREA (NORTH) $95,000
   - B. APRON USE AREA $360,000
   - C. WAREHOUSE AREA $200,000
   - D. GOLF COURSE - 9 Holes* $1,350,000
     - LAKE A (5' DEEP) $115,000
     - LAKE B (5' DEEP) $385,000
     - CLUB HOUSE (Landscaping) $90,000
   - E. GOLF COURSE - 9 Holes* $1,350,000
     - LAKE C (5' DEEP) $115,000
     - PRACTICE RANGE (Landscaping) $15,000

   **PHASE III TOTAL LANDSCAPING** $4,075,000
<table>
<thead>
<tr>
<th>PHASE III - LONG RANGE (2000-2010)</th>
<th>COST</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. STREETS, ROADS &amp; PARKING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. INNER/OUTER LOOP CONNECTOR ROAD</td>
<td>$150,000</td>
<td></td>
</tr>
<tr>
<td>B. PARKING</td>
<td>$508,000</td>
<td>$658,000</td>
</tr>
<tr>
<td>SUBTOTAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. STORM DRAINAGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. INNER/OUTER LOOP CONNECTOR ROAD</td>
<td></td>
<td>$20,000</td>
</tr>
<tr>
<td>4. WATER DISTRIBUTION SYSTEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. 6 &amp; 8-INCH LINES ON FUTURE OUTER LOOP ROW</td>
<td></td>
<td>$105,000</td>
</tr>
<tr>
<td>5. WASTEWATER COLLECTION SYSTEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. 6-INCH LINE FOR EXTENSION USE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AREA (NORTH)</td>
<td>$25,000</td>
<td></td>
</tr>
<tr>
<td>B. 2, 6-INCH LINES IN TECHNOLOGY CORE AREA</td>
<td>$20,000</td>
<td></td>
</tr>
<tr>
<td>C. 6-INCH LINE FOR FUTURE TECHNOLOGY AREA</td>
<td>$15,000</td>
<td></td>
</tr>
<tr>
<td>SUBTOTAL</td>
<td></td>
<td>$60,000</td>
</tr>
<tr>
<td>6. ELECTRICITY SYSTEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. ELECTRICAL DISTRIBUTION</td>
<td>$50,000</td>
<td></td>
</tr>
<tr>
<td>B. LIGHTING (STREET)</td>
<td>$40,000</td>
<td></td>
</tr>
<tr>
<td>C. TELECOMMUNICATIONS</td>
<td>$50,000</td>
<td></td>
</tr>
<tr>
<td>D. DEMOLITION</td>
<td>$75,000</td>
<td></td>
</tr>
<tr>
<td>SUBTOTAL</td>
<td>$215,000</td>
<td></td>
</tr>
<tr>
<td>7. NATURAL GAS (DISTRIBUTION SYSTEM - LONE STAR)</td>
<td></td>
<td>$30,000</td>
</tr>
<tr>
<td>8. DEMOLITION</td>
<td>$170,000</td>
<td></td>
</tr>
</tbody>
</table>

| GRAND TOTAL PHASE III - INFRASTRUCTURE | $5,333,000 |
| GRAND TOTAL PHASES I THROUGH III      | $22,454,000 |

* The Golf Course could be built by private funds through privatization of the golf course operations.*
TABLE NO. 9
TEXAS A&M UNIVERSITY RESEARCH CAMPUS
ULTIMATE DEVELOPMENT LEVEL

<table>
<thead>
<tr>
<th>Building Floor Space</th>
<th>Daytime Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology Core</td>
<td>2,392,000</td>
</tr>
<tr>
<td>Future Technology Area</td>
<td>737,000</td>
</tr>
<tr>
<td>Apron Area</td>
<td>418,000</td>
</tr>
<tr>
<td>Other Areas</td>
<td>400,000</td>
</tr>
<tr>
<td><strong>Riverside Campus Total</strong></td>
<td><strong>3,947,000</strong></td>
</tr>
</tbody>
</table>

Assumptions:

- Daytime population is estimated at four persons per 1,000 SF of floor space, except as stated below for "Other Uses".

- Technology Core and Future Technology Area developed at two stories.

- Building Footprint is 60% of Buildable Area in the Technology Core.

- Future Technology Area developed at same building coverage as for the Technology Core.

- Apron Area and Other Areas developed at one story.

- Apron Area buildable area is 25% of developable area.

- Other Areas: Conference Center 50,000 SF, 100 population; Recreation Center 40,000 SF, 100 population; Golf Club House 10,000 SF, 100 population; Extension Use Areas, land 270 ac., field shops, offices, classroom 100,000 SF, 300 population; Open Land Use Area land 600 ac., buildings 50,000 SF, 100 population; Extension Housing 50,000 SF, 200 population; Warehouses, Utility Service 100,000 SF, 50 population.

- Technology Core:
  - Developable Area 4,511,000 SF 100%
  - Building Area 1,994,000 SF 44%
  - Building Footprint 1,196,000 SF 27%
  - Parking 1,251,000 SF 28%
  - Walks, Drives, Landscaped Areas 2,063,000 SF 46%

Source: Bovay Engineers, Inc.
MANAGEMENT PLAN

A good management plan is essential to the development of the present Riverside Campus into the future Campus envisioned in the Master Plan. The transformation will take many years and will involve many changes as set forth in the Master Plan. More importantly, it will require many crucial decisions in interpretation, refinement, and revision of the Master Plan as development occurs. It is the purpose of this section to review management alternatives pro and con and recommend a management plan that is best suited to the implementation of the Master Plan. A well organized management plan will create a Riverside Campus which is admired, respected, and desired as an outstanding place for conducting research, experiments, continuing education and service.

Issues

There are a number of issues to be addressed in a management plan. The Master Plan provides goals, general plans, guidelines and specific improvements. Someone with supporting staff and funding will have to be assigned the responsibility and given the authority to make the routine and the major decisions required in the development of the Riverside Campus. Who this person might be and how this individual will fit into The Texas A&M University System is addressed in the succeeding discussion.

An important and sensitive area of the numerous decisions facing a Manager will be the allocation of space to agencies and organizations at the Riverside Campus. The determination and allocation of space will require careful continuing attention as old space is demolished and new space is constructed. This management task in itself is a significant one requiring the skills of a diplomat. The Master Plan recommends the phased demolition of 75 percent of the existing floor space and the construction of over 1,350,000 SF of new floor space by the year 2010. To achieve the projected needs of 1,500,000 SF of floor space virtually a new Campus will be built. The review of plans for new developments, the approval of these plans for conformity with the Master Plan, and the inspection of construction will also require close management.

Another management issue is the servicing and maintenance of the Riverside Campus at a level of quality commensurate to the satisfaction of those using the Campus. An important element of success will be a feeling by the users that an appropriate level of service and maintenance requirements are being met.

As the amenities, facilities and services are upgraded, the interests of the Campus should be promoted to help all become fully aware of the new image and reality of the Riverside Campus. Good public relations within and beyond the Texas A&M University System are a necessary element of the management plan. Events and activities should be promoted for the Campus which will keep it in the eyes of the Texas A&M University System and help keep the Campus fully utilized in meeting the needs of faculty, researchers, students, and visitors.
Alternatives

In examining the management alternatives it is fundamental to consider the present situation. Currently, there is no single management level position with the authority and responsibility to address the management issues stated previously. There has been some coordination of efforts by various personnel, but these efforts have been less than adequate to overcome the lack of a single management authority. The result is evident in the low level of haphazard development, an inadequate maintenance program, and the absence of appropriate and attractive support services.

The succeeding discussion will address three alternatives.

Alternative One - A semi-autonomous management organization. The size, location and self-contained nature of the Riverside Campus appear to be factors favoring a semi-autonomous management organization which could be close and responsive to the needs of the agencies and organizations located on the Campus. If the Campus was stable with few changes foreseen the semi-autonomous approach might work. However, the Riverside Campus will for years be a place of continuous change as it grows and develops, and as projects and programs come and go. The management of the space will require a closer involvement of TAMU than a semi-autonomous organization could provide.

Alternative Two - Contract management. This has merit where the facility to be managed has stable needs. The contract management alternative has the same disadvantages as the semi-autonomous approach. It would be too removed from the decision makers who must be involved in the ever changing space management of the Riverside Campus. The management of space will require continuous high level decision. Contract management would be too remote, lacking in the punctual and precise authority required to successfully resolve the conflicts arising out of the determination and allocation of space on the Riverside Campus. A negative factor for both contract and semi-autonomous management is that service and maintenance costs would probably be greater if the main Campus service departments were duplicated by a contract or a semi-autonomous management organization.

Alternative Three - Departmental Status. In keeping with the goal of integrating the Riverside Campus into Texas A&M University a departmental status would be appropriate. In as much as many of the agencies and organizations situated on the Riverside Campus are units of the Texas A&M University System it would appear that these important decisions affecting the future of the Riverside Campus would have to be made at the level of the President.

The best method to achieve the close cooperation and coordination required to implement the Riverside Campus Master Plan would be to directly involve the President's office of Texas A&M University by designating an appropriate individual. Such management organization would provide the authority and responsibility required to adequately cope with the management issues identified. With an Executive reporting directly to the President, Riverside Campus will be an integral part of Texas A&M University.
Proposed Organization

It is proposed that Riverside Campus be managed by an individual reporting to the President who would devote sufficient time to the assignment. The proposed position will require a sensitive, skilled University Campus development manager who can transform a currently haphazard, unsatisfactory partially developed outpost of Texas A&M University into a physically attractive, smooth functioning Campus fully admired, desired, and respected. The diverse and semi-autonomous users of the Riverside Campus will need a leader who is diplomatic but adamant in the discharge of the duties.

This individual would be responsible for planning and managing all aspects of the Campus operations including implementation of the Campus plan improvements; phasing of the demolition plan and construction program; assignment of space to the agencies and organizations which will best function on the Riverside Campus; determination and allocation of land and building space; enforcement of development guidelines and regulations; and servicing and maintenance of the Campus infrastructure including buildings and grounds.

The single most important factor is that this Campus should be attractive to the various departments, agencies and organizations who could best function at this location. This in turn would alleviate the congestion on the main Campus and improve the overall operation of Texas A&M University.

Support staff for the administrator with this responsibility should be appropriate. Other services would be provided by the various agencies of Texas A&M University such as the Facilities Planning and Construction Department and the University's operation departments including Security and Traffic, Physical Plant and Grounds Maintenance.

University Master Planning Committee

It is proposed that the Texas A&M University Master Planning Committee be given oversight responsibility of developing the Campus. The Committee will be supported by a number of University officials including a Riverside Campus Administration.

Funding

While a funding program for the development of the Master Plan for the Riverside Campus is beyond the scope of the report, adequate funding is essential to plan implementation. Cost estimates, phasing, and scheduling of improvements are outlined in a capital improvements plan elsewhere in this report.

Sources of funds to develop the Riverside Campus would have to be generated from a number of sources. These include appropriations (budgeting) through Texas A&M University and the Texas A&M University System. Other sources could include departmental, agency or organization appropriation. Training or research funds through federally aided programs might be another source of funding. Perhaps one of the best sources might be through private donations. A program identifying some of the Campus improvements i.e. golf course,