

# MAYAGÜEZ CAMPUS MASTER PLAN UNIVERSIDAD DE PUERTO RICO

*A Master Plan Report Prepared for:*  
**Universidad de Puerto Rico**  
Mayagüez Campus  
Mayagüez, Puerto Rico

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This Master Plan developed for the Mayagüez Campus is a blueprint, designed to provide a vision and framework to direct the growth of the campus for the next twenty-five years and beyond.

With participation and extensive feedback from the Chancellor and the RUM planning office, the Master Plan was conducted in three phases that included Site Reconnaissance & Campus Facilities Programming, Campus Development Approach (Vision), and an Implementation Strategy.

Conclusions drawn from the first phase found that RUM is an excellent institution with a good maintenance record; that there has been a tremendous expansion of the campus in the last fifty years; that recent growth has occurred in an ad-hoc fashion, creating an environment that is disconnected throughout the campus; that parking and overcrowding of facilities have become a major problem; and that with the relocation of PR-108 to the perimeter of the Campus, there will be new expansion opportunities for RUM.

The programming phase analyzed population and enrollment trends for the campus predicting a total student enrollment of approximately 16,000-17,000 students by the year 2020. Both the Engineering and Arts & Sciences Schools are expected to experience the greatest increases in enrollment, although enrollment in all the schools is predicted to rise. Even the School of Agriculture, which should restructure its curriculum and mission, is anticipated to reverse



current trends and increase its enrollment, offering new and more specialized programs.

This phase also examined campus-wide facility standards for the campus' major components such as academic/research uses, support services, and housing. Current on-campus facilities total 1,654,022 square feet. Using that as a base, and applying a reasonable rate of growth, projections indicate that the campus could increase 1.5 million square feet (including three new parking structures) by the year 2020. This increase is due to several factors including, the construction of new facilities in order to alleviate overcrowding problems, and projected increases in student enrollment; the modernization of aged and decayed facilities; and the addition of a housing component to the campus.

To accommodate this growth extensive site planning options were explored in phase three. Two preferred scenarios were articulated to meet the program requirements and reorganize the campus according to the following organizational principles:

- Reorganize campus facilities along an east-west spine to create a continuity of movement and uses throughout the campus;
- Cluster buildings and facilities to create a synergy by their proximity;
- Create four new gateways, along the newly relocated PR-108, that establish better movement both from within and to and from the campus;
- Reorganize parking to the periphery of the campus, creating a safer and more pedestrian friendly environment within the campus core;
- Create a series of major public open spaces or campus commons, which provide for passive recreation and visual enjoyment;
- Implement overall landscape improvements which reinforce the beautiful image of the campus.

Both scenarios are similar and offer the flexibility for future generations of administrators to make some adjustments combining, if necessary, elements from either of the scenarios.

Finally, this Master Plan offers suggestions for an implementation strategy which allows for the realization of the planned facilities in three, 8-year cycles. Priority projects such as the new Biology Building, Business Administration Building and expansion of the Student Center and Library, are included in the first phase. The Master Plan also indicates preliminary cost estimates for the construction of planned facilities totaling approximately \$175 million over the next twenty-five years.

In summary, we hope this Master Plan will be discussed and debated within RUM and Central Administration of UPR so that the outcome will generate a document that will guide the decision-making process for the development of this important campus.

Located on the western end of the island, the Mayagüez Campus is the second largest of the 11 campuses that make up the University of Puerto Rico (UPR) System. Like its sister campus, Río Piedras, it has been a leader in higher education and an agent for the social transformation of Puerto Rico. From its roots as an agricultural college, the Mayagüez Campus (RUM) has rapidly expanded and developed its programs, most notably in the fields of science and engineering, to become a comprehensive university campus. Offering undergraduate, master's and doctoral degrees in a wide range of fields, it has become an outstanding higher education institution complementing, both academically and athletically, the Río Piedras Campus.

The Master Plan for the Mayagüez Campus is the second Master Plan developed for the UPR System, as part of the continuing effort on the part of the University to develop a comprehensive, integrated planning strategy for the University as a whole. The need for a master plan for the Mayagüez Campus was addressed in the 1995 Comprehensive Self-Study, for the Middle States Association of Colleges and Schools accreditation, which also identified the lack of comprehensive campus planning efforts in the past. The main purpose of the master plan is to collect and synthesize relevant information to be used in making informed decisions on future planning.

The University of Puerto Rico, like most universities throughout the United States, is in a state of flux due to a multiplicity of internal and external trends that have contributed to an unclear future direction. Trends affecting the Mayagüez Campus include:

- I Decreases in government funding for higher education facilities will require external funding sources to be sought by RUM in order to continue its growth.
- I Due to decreases in financial resources available to universities and the decline in future enrollments the need for quality facilities and to remain current with new technologies will grow as competition among universities increases.
- I Rising costs will require new approaches for services and maintenance. To remain competitive institutions must reexamine the way they deliver services to maximize efficiency and cost-savings.
- I It is projected that the median age of the population of Puerto Rico, and throughout the United States, will continue to increase as society ages. The

traditional profile of the 18-24 year-old student will give way to a more heterogeneous student profile. This combined with the increasing emphasis by more professions for its employees to continue education will require new approaches in curriculum, services and facilities.

- I Collaborative efforts and partnerships with other academic institutions and private research entities will increase in demand, requiring facilities and flexible administrative structures to support them.
- I Institutions will be increasingly more accountable to address social issues, based on society's growing expectations and government's need for partners in solving social and economic ills.

Current trends will require careful consideration by policy makers when initiating key planning decisions and programming campus facilities.

### **What is the Master Plan?**

The Master Plan serves as a blueprint to direct the future physical growth on the Mayagüez Campus. As such, the Master Plan:

- provides a decision tree to assist the Chancellor, the President, and the Board of Trustees in making informed choices on the physical aspects of the Mayagüez Campus; provides the organizational and design principles within which growth and improvements are directed;
- identifies the types of uses which should be developed on the Campus, and the most appropriate location, size and building typology for them;
- considers the phasing and implementation of development, as well as trade-offs and implications for future options;
- addresses existing facilities and how to approach their maintenance, restoration or demolition;
- identifies facility maintenance principles to be later incorporated into campus-wide maintenance programs and policies (developed by the Mayagüez Campus);
- provides information that can be incorporated into financial programming for funding cycles;
- serves as a planning tool that can help decision-makers identify and articulate the implications of future options; and

provides flexibility in making development decisions and addressing current facility needs, while remaining flexible enough to accommodate the future needs of the Campus.

**This Master Plan document, while touching upon issues regarding curriculum, management/maintenance and administrative components, focuses primarily on the physical components of the Mayagüez Campus. Concurrently, studies are underway by the Campus regarding its curriculum, management/maintenance and administrative components. The conclusions of the analysis for the physical Master Plan, while being independent from the other analyses, is intended to be flexible so that as the conclusions of other studies emerge, informed choices can be made. Its conclusions should be regarded as guidelines to be followed by in-depth studies that provide greater detail and more accurate test results.**  
**Methodology**

The Mayagüez Campus Master Plan evolved from a methodology that divided the process into three phases:

- Phase I: Site Analysis and Campus Program
- Phase II: Draft Campus Development Plan
- Phase III: Master Plan Implementation Report

#### *PHASE I: SITE ANALYSIS AND CAMPUS PROGRAM*

During this initial phase, data was gathered and examined to: provide an institutional analysis of the Mayagüez Campus; to identify important trends which may act upon it in the future; and to provide a campus planning context and site analysis, as well as an evaluation of existing facilities. Conclusions drawn from these analyses formed the basis of the Campus Facilities Program, the Campus Development Approach, and the Master Plan Implementation Report in later phases of the Master Plan study.

Data used in the analysis was gathered by several methods throughout the Master Planning process:

##### *Site Visits / Observations*

Since the database from the Planning Office regarding Campus facilities is not extensive, site and building assessments were based largely on field observations. Numerous site visits were made by the Master Plan Consultant to record data from observations on the Campus as well as in the surrounding neighborhoods. A selective photo survey was also undertaken. Information gathered during site visits was crucial to understanding both the conditions and the inner workings of the campus.

### *Interviews*

An important aspect of data gathering for the Master Plan was the high level of participation with the Campus community in the planning process. Responses and comments from key Campus personnel, and administrators, were obtained through interviews. With responses and insights gained from these efforts, a development approach was then conceived to best address a variety of concerns and issues of a complex, growing institution.

### *Review of Documents*

The Master Plan Consultant reviewed the following documents provided by the Campus:

- Comprehensive Self Study Report (1995)
- Mission Statement of the Mayagüez Campus
- Permanent Improvement Programs
- Preliminary Master plan Concept (yr. 2,000)

The Master Plan Consultant also reviewed documents received from other agencies:

- City of Mayagüez planning reports

### *Presentations*

It was important to encourage as much participation as possible in the master planning process. At the end of each of the first three work stages, a presentation was made to the Chancellor of the Mayagüez Campus and his planning staff. At the completion of the draft report, feedback and comments were received and then incorporated into the development plan for the Campus. In addition, the draft report and graphics will be widely discussed and illustrated to elicit comments and refinement to the final master plan.

## **CAMPUS FACILITIES PROGRAM**

**BASED ON THE ANALYSIS AND CONCLUSIONS DRAWN FROM THE SITE ANALYSIS, A CAMPUS PROGRAM WAS DEVELOPED WHICH EXAMINED FACILITY STANDARDS AND CAMPUS-WIDE REQUIREMENTS FOR THE MAJOR PHYSICAL COMPONENTS OF THE MAYAGÜEZ CAMPUS. PHASE II: CAMPUS DEVELOPMENT PLAN**

From the results of the previous phase, a development approach to direct growth of the Mayagüez Campus was produced and a series of design and organizational principles for the campus created. These principles provided the framework for a campus growth strategy that meets the goals of the Master Plan.

Two Scenarios were developed to test conceivable building and site configurations. Each Scenario addressed the programmatic needs of the Campus for the year 2020 and beyond, illustrated a maximum potential build-out, and adhered to the organizational and design principles that were established earlier in the Master Plan. From these Scenarios, initial location decisions needed to move towards implementation were identified, as were priority development projects.

### *PHASE III: MASTER PLAN IMPLEMENTATION REPORT*

The Master Plan Implementation Report outlines the major steps that need to be taken by the Mayagüez Campus in the implementation and phasing of a preferred scenario. This Report includes the selected campus program and site plan, project phasing and implementation strategies, and preliminary cost estimates. In addition, the master plan report offers next courses of action for the Campus, critical path scheduling and a set of facility maintenance principles/goals.

## **2. PHASE I: SITE RECONNAISSANCE AND ANALYSIS**

To fully understand the complex and interactive forces that will shape the future of the Mayagüez Campus, both internal and external environments were examined. The analysis was structured into components that build and support the conclusions and resulting goals of campus redevelopment. These components included a brief historical analysis of the Mayagüez Campus and its relationship to the University of Puerto Rico, an institutional analysis, a physical analysis of Mayagüez, a campus site analysis, and a facilities analysis.

### **Background**

#### *HISTORY OF THE MAYAGÜEZ CAMPUS AND ITS RELATIONSHIP TO THE UPR SYSTEM*

The Mayagüez Campus was founded in 1911 as the College of Agriculture, part of the University of Puerto Rico based in Río Piedras. Credit for establishing the college is given to the joint efforts of D.W. May and Carmelo Alemar, respectively Director and Secretary of the Federal Experiment Station and José de Diego, a noted Puerto Rican legislator and poet. The following year the school was given the name it would bear for 50 years: the College of Agriculture and Mechanical

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Arts of Mayagüez (C.A.A.M.). Over the years the Mayagüez Campus strengthened and diversified many of its academic programs, establishing the College of Engineering in 1942 and the College of Arts and Sciences in 1959. Six years later, when the new University law took effect, Mayagüez became an autonomous campus. It was during this period that the fourth school, the College of Business Administration, was added to the campus, as well as the incorporation of the Agricultural Experiment Stations and the Agriculture Extension Services into the College of Agricultural Sciences.

Today, the Mayagüez Campus a Land Grant, Sea Grant and Space Grant institution is comprised of four Colleges: Agricultural Sciences, Engineering, Arts and Sciences, and Business Administration; offering a total of 2 Associate degree programs, 52 Bachelor's degree programs, 27 Master's degree programs, and 2 Doctoral degree programs. In addition, the Campus offers a Community Services and Extension Division, a Military Science Department, and an Aerospace Studies Department. The Campus also houses a very successful Research and Development Center. Steps are being taken to transform the Center into a Deanship of Research and Development.

### **Institutional Analysis**

The institutional analysis was developed by reviewing documentation prepared by the Campus. This documentation includes the Mission Statement, the Comprehensive Self-Study (1995), and a report by the Chancellor entitled "Toward the Third Millennium: A Vision of The Future Development of the Mayagüez Campus", all of which are summarized below. To expand upon the findings in these materials, additional information was gathered from the campus community. A series of interviews were conducted to further assess the current conditions of the campus, and to develop data on both its current needs and future growth.

### ***MISSION STATEMENT***

With the philosophical framework established by the Law of the University of Puerto Rico, the Mayagüez Campus is dedicated to the mission of providing society with citizens trained professionally in the fields of agriculture, engineering, natural sciences, social sciences, humanities, and business administration, and possessing a broad socio-humanistic background which will prepare them to contribute to the economic, social, and cultural development of Puerto Rico. The mission statement includes a set of objectives that include a commitment to:

- arts and sciences;
- ethical and aesthetic values;
- instruction, research and service to community;

- regular and continuing education;
- combining teaching and research;
- professional and leadership training;
- social and economic commitment to society;
- developing critical thinking in the students;
- cooperative education based on the needs of society; and
- intellectual, entrepreneurial, social, and spiritual development of the students.

### *THE COMPREHENSIVE SELF-STUDY REPORT*

The Comprehensive Self-Study Report (1995) provides an excellent picture of campus' current situation, its strengths, concerns, and recommendations. The report identifies the Mayagüez Campus as an institution dedicated to instruction, research, and the needs of society. The Study uses the objectives of the campus mission as an evaluation measure.

#### *Strengths*

- Potential to be a world class university
- An enrollment that continues to grow at undergraduate and graduates levels
- Many new, young faculty members
- Extended outreach capabilities, especially through its role as a Sea Grant college and the extension programs in agriculture
- Academically known for its strong and stable programs attracting the most accomplished students in Puerto Rico
- A symbiotic relationship with the City of Mayagüez
  - | An essential part of the economic and cultural development of the Western half of Puerto Rico
  - | Its influence on the development of the island
- A broad range of programs



### *Concerns*

- Mission statement needs strategic direction; one that can be stated clearly, succinctly, and in terms that are measurable
- An administration that is too bureaucratic
- Lack of efficiency regarding funding and how and where it should be utilized
- Rapid turnover of upper level administrators
- A curriculum that needs to be reviewed and modernized, especially the core curricula for the students
- Not retaining enough students
- Parking limitations
- Student services that are in need of improvement
- I - Physical facilities and a campus population that have outgrown maintenance capabilities
- Lack of academic, administrative, and fiscal long range planning
- Campus security regarding internal and external transportation services, lighting, and Campus police

### *Recommendations*

- ✓ Clarify and improve the balance between teaching and research
- ✓ General improvements in administrative functioning, systematization, procurement process, clarification of roles and functions, and management effectiveness
- ✓ Consolidate planning efforts
- ✓ Begin a strong preventive maintenance program
- ✓ Standardize procedures for appointment, tenure, and promotion

## CHANCELLOR'S VISION FOR THE CAMPUS

In a report entitled *Toward the Third Millennium; A Vision of The Future Development of the Mayagüez Campus*. (April, 1984), the Chancellor of the Mayagüez Campus, Dr. Stuart Ramos, summarizes the strengths and weakness of the Campus and expresses his views on its future developments. Upon conclusion, the Chancellor offers the following three guiding notions:

### *I The Formation of a "Complete Campus"*

The Mayagüez Campus has traditionally been regarded as the "technological campus" of the UPR system. Its role as such has limited its ability to fulfill its mission under the University Law. It should build upon its solid technological foundation and expand its programs, particularly those in Liberal Arts, as Texas A & M and M.I.T have done.

### *I Research Institution*

Currently classified as a "Comprehensive University," offering "Baccalaureate programs and, with a few exceptions, graduate education through the master's degree," the Chancellor proposes developing research in the Campus with additional commitment to graduate education in certain selected areas.

### *I Center for Latin American Studies*

In response to the increasing global competition for higher education, the University of Puerto Rico, and the Mayagüez Campus specifically, should refocus its attention on Latin America and develop a niche in this market as a center for the study of all aspects of Latin America.

## ISSUES

The following summary of issues were derived from the review of documents provided by the Campus as well as from comments by RUM staff. These issues help formulate a campus development approach and a preliminary development program. They are categorized as either general or stated facility needs.

### *General*

#### Academic Issues

The Campus must examine its present role as a "technological campus" within the UPR system in order to develop into a "complete campus". In determining the best course for the Campus and to avoid unnecessary competition and duplication of programs, it is important to consider its evolution from an agricultural college into a science and engineering school.

### Research vs. Teaching

The current debate over research vs. teaching has been unproductive and must be terminated. Instead resources must be prioritized to strengthen both the institution's teaching and research components, as well as to provide services to the community. Investment in these areas is consistent with the goals of the RUM Mission Statement.

### Changing Campus Population

The increasing diversity of those who wish to pursue an education at the Mayagüez Campus will require more resources for financial aid and facilities.

### Faculty

New incentives are needed to attract talented faculty. Better criteria needs to be developed in the areas of promotion and tenure. Current faculty are not evenly distributed throughout the schools. Certain departments have not had any increase in faculty members even though they have had dramatic increases in student enrollments.

### Funding

The Campus cannot grow and evolve if it depends heavily on state funding. The institution must continue to reach outward to other institutions (through exchanges) and the private sector for additional revenue sources.

### Technology and Research

Although the Mayagüez Campus has impressive computer facilities, it lacks a campus-wide policy for the coordination and upgrade of computer resources in order to remain competitive in today's technological society.

### Deferred Maintenance / Facilities Management

Although the current state of the physical facilities is in general quite good, the Campus lacks systematic information on building and utility conditions, as well as on code analysis. The campus maintenance and planning departments have no comprehensive inventory of the facilities and little relevant data on facility utilization levels, energy usage, maintenance and inspection schedules. Until now physical planning has yielded acceptable results within budget limitations, but improved long-term planning will be necessary for the future.

### School of Agricultural Sciences

The Chancellor's report *Toward the Third Millennium* highlights the serious problem of the general deterioration of the College of Agricultural Sciences. The current budgetary situation of the Agricultural Experimental Station and the Agricultural Extension Service makes the problems even more difficult. These issues are currently under examination at the System, Campus and School levels in order to develop immediate short term and long term strategies.

## *Stated Facilities Needs*

### Academic & Research Facilities

There is a general need throughout the Campus for lecture and auditorium space.

Due to increased enrollment, several programs have reached the limit of their existing physical facilities, in particular, the business administration and biology departments. Expansion and/or new facilities are in the planning process to deal with such shortages.

For the same reasons additional space is required for some departments of the School of Arts and Sciences in order to be able to meet their needs. The School of Engineering must continue its relocation to the Engineering Complex area. The space freed by these actions can then be used as additional space for the School of Arts and Sciences.

Increased demand for advanced degrees and research programs will necessitate further investments in technology and substantial improvements in physical facilities.

### Support and Service Facilities

The library needs to continue its expansion to bring computer facilities and educational technology in close proximity and to expand its space for collections, administration duties, processing, and delivery to remain technologically competitive.

The Mayagüez campus is one of the only campus' in the UPR System that does not have an adequate theater. Existing facilities do not have the seating capacity nor stage space needed for full scale productions.

Most of the athletic facilities are in need of restoration and/or maintenance. Improvements are currently being made on the track & field facilities. Improvements to the soft ball park, the tennis courts, the swimming pool, and the Coliseum are in the planning stages.

## **Physical Analysis**

To fully understand the context in which redevelopment and new construction will take place, it was necessary to briefly analyze the city of Mayagüez, the Campus site and its current facilities, and the relationship between RUM and the City. Findings and conclusions in these areas are based on observations made during site visits and on written documentation. (see Appendix A).

*MAYAGÜEZ ANALYSIS / ISSUES*

## *City History*

Located on the west coast of the Island, where the Yagüez river meets the Mayagüez Bay, the City of Mayagüez began as a Spanish colonial port town under the patronage of Nuestra Señora de la Candelaria. Because of its port, Mayagüez developed quickly, achieving the status of town in 1836 and city in 1877. Relatively unaffected by Puerto Rico's becoming part of the North American colonies in 1898, the city's growth continued increasing. By the end of the World War II, Mayagüez had become the third most important city in Puerto Rico with a population of 88,000 in 1950. Today, with a population of over 100,000, Mayagüez is Puerto Rico's third largest city.

## *City Growth Pattern*

The layout of the old town is a vestige of its colonial past. Located on a hill just south of the Yagüez river, the city's civic and historic center is marked by a public plaza, Plaza Colón, with the main Catholic Church and City Hall at either end. (see Figure 2.3) Several buildings in close proximity to the plaza, dating back to the early 1900's, including the Teatro Yagüez (1909-1920), are now in excellent condition having been recently restored. Most of the buildings range from 3 to 5 stories, with commercial space on the first floor and residential above. The small colonial streets are busy, mostly one-way, and allow on-street parking. The area remains actively commercial with small local shops, especially along Calle Post.

Half a kilometer west of the city center is the old port. No longer active, the remaining fishing and shipping industry warehouse buildings are either abandoned or have been replaced by car dealerships. Several public housing projects, in Candelaria and Columbus Landing, have been built nearby. The area is in general economically depressed. Recent attempts to reinvigorate this area, including the restoration of the elegant colonial Customs House, have been made by the city.

Separating the old port area from the rest of the city is PR-2, a three lane expressway and principle roadway traveling north-south. Elevated at times, PR-2 is a physical barrier that creates a distinct division between the economically well-off areas to the East and the economically depressed areas to the West.

The *Yagüez River* establishes the northern boundary to most of the city, with a few neighborhoods above this line. Although an important element in defining the urban patterns of the city, the river has historically been regarded as an eyesore and the land around it underutilized. Its banks have been canalized to prevent flooding with adjacent land serving as parking lots or remaining undeveloped. However, recent plans to develop a linear park along the river's southern bank suggest that its potential as a natural resource may soon be realized.

Scattered throughout the city are residential neighborhoods, Marina Concordia, Barcelona, Buena Vista, Ponce de Leon, Mayagüez Terrace, etc., separated from one another by changes in the street pattern, major roadways, or the Yagüez River. Most of the houses are one and two story detached homes. The condition of the housing varies according to the neighborhood, and although much of it old, almost all appears occupied. The infrastructure, however, is in need of significant improvements, particularly the electrical wiring throughout the city.

Among Mayagüez's attractions are the Yagüez Theater, the Plaza Colón, the Market Plaza, the Federal Tropical Research Station and Botanical Gardens, the Puerto Rico Zoo, the Palacio de Recreation (Sports Complex), and the RUM campus.

The economic base of the city, originally a labor intensive manufacturing industry (agriculture, textile, and tuna) has been steadily replaced since the 1950's by "high tech" industries (electronic and pharmaceutical.) Primarily composed of small businesses, the city's economy supports two large employers: the Campus and the Star-Kist tuna plant, located Northwest of the city and employing over 5,000 local residents. The city also contains a large number of medical and health related facilities located just north of the civic center.<sup>1</sup>

### *Demographics*

According to 1990 census data, the population of Mayagüez was 100,371 inhabitants, approximately 1,400 per square mile. The slow but steady increase in population over the last 30 years, 4.3% annually, is mainly due to migratory movements. The projected population for the year 2005 is 112,372 inhabitants.

### *Urban Growth and Planning Context of Mayagüez*

Based on site visits and aerial photography of the City of Mayagüez and surrounding areas, observations as to the growth patterns of the city were made. (see Figures 2.1 and 2.2) Originally developing along the river and coastline, the city's growth is now principally determined by the regional roadways. Although large areas of undeveloped land continue to surround the city, they are rapidly being developed.

Of particular note are two general trends:

*1 Residential Development in the Mountains*  
Clearly visible in the aerial photograph (Figure 2.1) is a distinct pattern of housing development in the Western Mountain region along its regional roads, particularly along routes P.R.108, P.R.104, P.R.105, and P.R.106.

### *I Commercial Development along PR 2*

Much of the new commercial development is occurring along route P.R.2 both to the north and south of the city. Kmart and Builder's Square can be seen just north of the city, and to the south is the Mayagüez Mall. These commercial developments draw commercial activity away from the downtown area.

### **Planned Improvements for Mayagüez**

To the best of our knowledge, Mayagüez does not have an overall plan for development. However, a number of planned improvements are currently under consideration. They will begin to encourage commercial and residential redevelopment and promote greater interaction with the Mayagüez Campus. Figure 2.4 illustrates the following projects:

### *I Main Street Redevelopment Program*

In an attempt to revitalize the downtown core, the city of Mayagüez is taking part in the *Main Street* program, a national program that has had marked success in small cities throughout the U.S. The program depends on the simultaneous implementation of a four point strategy of economic restructuring, marketing, design, and organization, and is based on a set of philosophical principles that emphasize local participation and involvement and incorporates the preservation of historic buildings. At the time of our first site visit several historic buildings had been restored or renovated and the Plaza de Colón was undergoing restoration work.

### *I Coastal Zone Redevelopment*

A proposal to commercially redevelop the coastal area, extending from the mouth of the Yagüez River south to the Candelaria neighborhood, and inland several blocks from the coast. Much of this area was historically the Mayagüez port.

### *I Linear Canal Park*

A proposal to develop a linear park for recreational use along the southern bank of the Yagüez River, extending from the Parque de los Proceres (PR-108) to the mouth of the river (PR-102).

### *I Relocation of PR-108*

*A proposal to relocate PR-108, creating a loop around the RUM campus, with the intention of providing better access to PR-2 for the new housing developments in the Western mountain region. The existing PR-108 will become an internal road for the use by the Campus. Purchase of some of the RUM's land will be necessary. As of the writing of this report, the approval date for the project was estimated at November 1996 and construction time was estimated at 3 years.*

### *Expansion of Calle Post*

In conjunction with the relocation of PR-108, Calle Post is being expanded from two lanes to four, establishing a four lane connection between PR-2 and PR-65. This project entails the purchase of land from the University and the building of a large retaining wall.

### *Mayagüez Development Issues*

In light of the city's planned improvements, the following is a brief summary of issues to be considered as future development proceeds. Figure 2.5 illustrates the following issues:

### *I Development Pressures*

As the number of residential developments in the Western mountain region gradually increases greater needs for infrastructure will also increase. As the Mayagüez Campus continues expanding outwards it will soon meet with the development forces pressing inwards.

### *I Traffic Congestion*

With the relocation of PR-108 and the expansion of Calle Post (Spur-2), the volume of traffic in the area will increase significantly, resulting in greater congestion at the major intersections. Increased traffic will also exacerbate the existing congestion along PR-2 in the city center.

### *I Infrastructure and Housing Decay*

In general, the city's infrastructure is in need of improvement, particularly as demands upon the city increase. Pockets of decay, where the condition of housing or infrastructure was markedly poor, were identified in Figure 2.5.

### *I Lack of Connection*

As the principal regional roadway, PR-2 runs north south through the city creating a distinct division between the downtown and coastal areas of the



city. Efforts should be made to improve the lack of connection created by this and similar roadways.

#### Resource Underutilization

The coastal area along the Mayagüez Bay is a significant potential resource that is currently underutilized.

#### I Concentration of Public Housing

Concentration of public housing, such as that in the Columbus Landing / Candelaria neighborhoods, should be avoided and more evenly dispersed throughout the city.

<sup>1</sup>1990 census information.

### **Campus Site Analysis / Issues**

#### *HISTORY AND GROWTH OF THE CAMPUS*

Much like the adjacent city, the Mayagüez Campus also began on top of a hill. "College Hill," as it is often referred to, is a steeply sloping hill north of the city center, just across the Yagüez River. At the foot of the hill lies Calle Post, which at the time was the principal north-south road from Mayagüez to Añasco, the nearest city to the north. The main campus gate sits at the base of the hill along Calle Post and from here, the main campus road, Caobos Street, winds its way to the buildings above. Thus from its inception, the topography and natural features in and around the Campus have played an important role in shaping its growth.

Construction of first campus building began in 1912 with the Federico Degetau Hall, named after Puerto Rico's first Resident Commissioner, soon followed by the José de Diego Hall (1916), named after the notable legislator and poet who cofounded the College. These two buildings and the Chancellor's former residence constitute the first stage of building on the Campus.

The second stage of campus growth began in the mid 1930's with the construction of the Dean of Student's Building. In 1936, both the Luis de Celis Hall and the Luis Monzón Hall were built. Collectively, this trio of buildings was known as the Big Three.

As Figure 2.9 illustrates, during these first two stages of growth as the School of Agriculture, the early campus buildings were tightly clustered on top of College Hill with agricultural fields and farms on the downward slope to the north. The close proximity of these buildings created a series of interconnected, highly defined outdoor areas, which with the benefit of skilled landscaping, which still remain very attractive gathering spaces.

During the 1950's the Campus entered into its third stage of growth, a period of unprecedented expansion. Bordered on the east by the Federal Tropical Research Station lands and on the south by Calle Post, the Campus grew to the north and west where it eventually was defined by PR.108 and the Quebrada de Oro canal respectively. At the center of this roughly defined square, was built the campus center, the General Library, and the Arts and Science Building, Chardon. These three buildings enclose a large, formal cardinaly oriented courtyard, the main quadrangle, marked by flamboyant trees and diagonal pathways. The fourth side is defined by Palmeras Avenue, a street lined by majestic palm trees, and the two main dormitory buildings slightly behind. The public nature of these buildings, their positioning, design, and close relationship to the older campus buildings above, all contributed to successfully creating a new center with a sense of place and a cohesiveness, which to this day remains the principle gathering space on Campus.

The final period of growth, from the 1970's to the present, did not follow traditional patterns. Larger buildings with adjacent parking began to fill in the remaining areas of the main campus. Once full, clusters of buildings were built on nearby hilltops, such as the swimming pool and new dormitory complex to the west and the new engineering complex to the north. These new buildings had little formal relationship to the existing buildings, ignored the traditional formations around public open spaces and courtyards, and utilized large portions of land for relatively little gain. This shift from a dense, tightly knit and pedestrian oriented campus to a low density, car oriented, clustering system has resulted in a loss of clarity and cohesion and a three fold increase of the campus limits.

Selected photographs of existing conditions around the campus are illustrated on pages 37 & 38.

Planning for future development, especially in the areas adjacent to the main campus, provides an opportunity to recall some of the Campus' early organizational concepts and to correct the incoherent patterns that have since developed. This planning effort will be key for the Mayagüez Campus because new strategies to establish growth parameters must be created in order for a manageable and coherent pattern to emerge.

### *CULTURAL ASSETS / HISTORIC BUILDINGS*

"La Loma Colegial" or College Hill has upon it an historically and culturally significant collection of architecture reflecting various 20th century styles including mission, prade, neoclassical, federal, art deco, and international. These buildings and monuments, built by some of Puerto Rico's most famous architects and dedicated to several of the Campus' and Islands' important historical figures, is an significant cultural resource for both Mayagüez and the Island.

Currently the Campus is petitioning to have College Hill landmarked as a historic district, including the following buildings and monuments: (see Figure 2.11)

- | José de Diego Hall, 1916.
- | Student's Dean Building, 1935.
- | Portico Degatau, orig.1912, rebuilt 1988.
- | Antonio Luchetti Hall, 1954.
- | Sanchez Hall, 1940.
- | Luis de Celis Hall, 1936.
- | Luis Monzón Hall, 1939.
- | Eugenio Maria de Hostos Monument and Fountain, 1940.
- | Instituto de Agricultura (Old Institute), 1924, 1965.
- | Chancellor's House, 1927, 1953.
- Athletic Field, orig. 1911, 1952, 1985, 1994.
- | Angel F. Espada Gymnasium, 1963, 1989.

One of the architects responsible for a large number of buildings on the Mayagüez Campus was Henry Klumb (1904-1984), a student of Frank Lloyd Wright's and widely regarded as one of Puerto Rico's most noteworthy architect. The Mayagüez Campus is proposing to restore several of the buildings on campus that Klumb designed to their original state. They include:

- Chancellor's Residence (1927, 1953)
- Jesus T. Piñero Building (1952, 1984)
- Antonio Luchetti Hall (1954)
- General Library (1963)
- Student Center (1958)
- Luis Stefani Building (1958)
- Sanchez Hidalgo building (1960)
- Business Administration building (1960).

### *CITY / CAMPUS RELATIONSHIP*

The City and the Campus share a symbiotic relationship as separate entities that share a friendly relationship. The two have grown and developed side by side, at times providing each other with facilities and resources, but never integrating or creating substantial lasting bonds. In large part, this separation is due to the physical separation by the Yagüez River and Calle Post . Over time, this separation has become more distinct as Calle Post developed into a larger roadway.

Although physically separate, the City and Campus due share a number of facilities and resources. Because the Campus does not offer student housing, the majority of RUM's 12,300 students rely on the city for their housing needs.

Although some students chose to commute from nearby towns, most live in one of two convenient locations: *Mayagüez Terrace* or the *Barcelona Neighborhood*. Mayagüez Terrace is a housing development, composed of one and two story privately owned houses, adjacent to the Campus along PR-2. Similarly, the Barcelona Neighborhood is just across the river from campus main gate. Off-campus housing helps support the local economy, not only in generating real-estate, but also by supporting the local shops and restaurants. In addition, many of the faculty and staff live in the city and participate in government and other local organizations.

The Campus and City also share facilities. The athletic track, adjacent to the main gate is routinely used by local residents, from early morning jogging to afternoon soccer matches. The *Yagüez Theater & Cultural Center* in the center of town are used for student performance because the Campus does not have a large facility for theater productions. The city also provides a free municipal trolley that travels from the Plaza Colón to the Campus and back again. The sharing of facilities and resources provide RUM and the City with an understanding of one another that is necessary for a healthy relationship, and critically important for fulfilling the Campus mission.

As the city continues to grow, eventually surrounding the Campus, the physical barriers between the two will become less distinct.

## *CAMPUS SITE COMPONENTS*

In physical terms, the Mayagüez Campus is an aggregation of site components that form its environment. These include the topography and natural features, buildings, landscaped areas, and hard surfaced areas such as parking lots and roadways, illustrated in Figure 2.12.

### *Topography, Quebrada de Oro, Roadways*

Three significant physical elements helped shape the Campus into what it is today: the topography, the Quebrada de Oro canal, and the regional and campus roadways. (See Figure 2.10).

Composed of several hills and valleys the Campus enjoys a varied topography providing it with a richness of views and vistas. The early campus architects used the topography to great advantage in creating a complex organization of buildings that dynamically relate to one another through position, height, and views.

The more recent clustering organization also takes advantage of the topography, but in a much simpler way. By initiating these clusters at the tops of hills it allows

for a clear separation between them, and affords them easy future expansion as well as providing them with good views.

Once the defining western edge of the main campus, the *Quebrada de Oro* now runs through the middle of the Campus' developed land. Along this path, its character changes; hidden and undisturbed in the dense wooded area adjacent to the new engineering complex; exposed but essentially unaffected along Pinos Street; and finally canalized, its embankments widened and cemented over, in front of the Coliseum building and the southern portion of the campus. It remains a relatively undeveloped internal edge, its potential as a significant design element for the campus overlooked.

Similarly, the regional roadways, Spur-2/Calle Post and PR-108, have also defined the edges to the campus, south and north respectively. However, now that the campus has extended north beyond PR-108 with the engineering cluster and the nuclear research center, the road remains a barrier. Fenced on both sides and with few gates, pedestrians are left to cross the increasingly heavy traffic or to use the pedestrian overpasses. With the expansion of Calle Post, the physical separation between the Campus and the City will become even more severe.

### *Natural Resources*

In addition to land being used for agricultural research, RUM is very fortunate to have large amounts of undeveloped land along its perimeter. As the housing developments just outside the Campus limits continue to grow and the Campus itself continues to expand, these areas become more and more precious. For ecological as well as design reasons, they must be considered a resource, preserved or wisely utilized. If developed, they should function as places of significance within the campus.

### *Buildings*

The early buildings of the Campus developed a cohesive architectural language of form, scale and materials. They took consistent approaches to building location and orientation, construction materials and decoration. They enclosed within their built forms courtyard spaces that provided places of social interaction and exchange, as well as solitude and reflection. Building facades were highly articulated and permeable to not only give enclosure and a sense of place, but to give form to public spaces and campus streets. All of these elements were combined to give a coherency to the built environment that has been lost in some of the newer Campus developments.

Many of the campus facilities constructed in the past several decades utilize architectural languages unique to themselves. The use of a common palette of materials, systems or components has not occurred, giving a fragmented

appearance to the campus-scape. Varying orientation and positioning among newer facilities has led to the loss of well-defined public spaces and buildings that are largely unrelated to one another. The result is a less coherent built landscape with little campus identity. (For the complete Existing Building list see Appendix B)

### *Landscape Elements*

One of the most striking elements of the campus is its lush vegetation. Great care and effort has been expended on shaping spaces and instilling in them a particular quality of space through variety of tree and plant materials. Singular majestic trees, strategically located, serve as landmarks and provide canopies to gather under. Groups of trees are used to create large shaded area such as in front of the Coliseum. Trees of the same variety are used along roadways and paths to accentuate their direction and movement. In fact, all the Campus roads are lined with trees of a particular type and are named after them.

The well orchestrated use of plant materials, in conjunction with plazas and courtyards, provide places for recreation, artistic and social expression, and the enjoyment of nature. They are the places where most of the pedestrian movement occurs on campus. They are public places, for the most part, and at times provide a common ground with the community, such as the athletic field by the main gate.

### *Parking*

In and around the older campus buildings on College Hill, parking is scattered into small lots to minimize its visual impact. As the need for parking increased, due to larger buildings and more commuting onto campus, the parking lot sizes have also grown. In some cases, such as adjacent to the Coliseum, they have been landscaped to minimize their visual impact. In others, however, as in the case of the library parking, they remain large fields of asphalt, convenient, but unattractive. As the periphery clusters of buildings develop, larger on-grade parking areas are being proposed and built at the expense of the natural undeveloped land. In general, these parking areas take up a large percentage of available land both inside and outside of the main campus boundaries.

### *Residential Facilities*

Although RUM does not provide on-campus housing, it does have residential facilities in three locations:

Six houses for faculty, constructed in 1940, adjacent to PR-108. Three were recently demolished to allow for the construction of the new chemistry building.

Building A, built in 1978, a 7 story, 80 unit hotel/hostel providing temporary housing for visiting faculty and persons affiliated with the Campus. Originally designed as student dormitory rooms. Buildings B & C were originally constructed as dormitories, although they now are used as offices.

The Darlington Building, constructed in 1953, an 11 story, 121 unit apartment building located off campus. Fully occupied, it houses faculty on 5 floors, graduate students on 4 floors, and scholarship recipients on 2 floors. In addition, it has fully occupied commercial spaces whose tenants include: the Electric Energy Authority, WORA TV and Radio, the Cultural Institute, Cellular One, and GTE. Maintenance for the building has been neglected.

It should also be noted, that the Business Administration and Continuing Education Division Buildings were both originally designed as dormitories.

### *OFF-CAMPUS FACILITIES*

As Figure 2.13 illustrates, RUM has several off-campus facilities related to its academic programs including the Agricultural Experiment Stations, the Agricultural Extension Service, and Magueyes island.

#### *Agricultural Experiment Station (AES)*

The Agricultural Experiment Station is part of the College of Agricultural Sciences and is programmatically and administratively integrated with the Mayagüez Campus. Its primary mission is to "conduct scientific research leading to a more ample and efficient agricultural development, the conservation of natural resources, the protection of the environment and the enrichment of the quality of rural life." The AES includes two research centers in Mayagüez and Río Piedras and six regional substations in Isabelá, Adjustas, Lajas, Corozal, Fortuna, and Guarabo, constituting 2,198 acres of land off-campus. Each substation is located in a distinct climactic region and conducts soil and agricultural experimentation native to that particular region. (See Appendix C for more information on the A.E.S.)

Due to a very limited increase in funding over the last 11 years, the AES has suffered a severe decline in research personnel and decay in its physical facilities, particularly during 1983-86 when absolutely no funding for major improvements was available. Despite the lack of adequate machinery and vehicles and a scarcity of personnel to attend to the relevant requirements of research, the station has always had a vigorous research program. The station enjoys world recognition as one of the most outstanding institutions in tropical research, throughout the Caribbean Basin, and Central and South America.

### *Agricultural Extension Service*

The Agricultural Extension Service is a public service to provide local farmers with information on agricultural and soil improvement techniques. With local offices in all but 9 of Puerto Rico's 77 towns, the service distributes printed material to anyone who requests it. In addition, the service also provides on-site consultation services performed by its agricultural engineers based out of its five regional offices. The six administrative offices manage the day to day administrative needs of the local and regional offices. The central office, located on the Mayagüez Campus, oversees the entire program. In the last few years, the service has expanded its program of offerings to the public to include a broader range of agriculture related information such as cooking and dietary information.

It is beyond the scope of this Master Plan to examine in detail the planning needs of the Agricultural Experiment Stations (AES) and the Agricultural Extension Services, although serious attention should be given them. Both services are currently under review. The permanent improvements for the year 2000, allocates \$4 million for improvements to both the A.E.S and the Agricultural Extension Service. Current efforts are being made to improve the situation, including the transfer and consolidation of all administrative functions to the Mayagüez facilities, and will be discussed in more detail in the following chapter.

### *Magueyes Island*

Magueyes island, a 35 acre island just off the southern coast, near Lajas, is a research center for the Marine Sciences department. Its facilities include: classroom/laboratory facilities, indoor/outdoor aquaria and tanks, a museum with reference collections, and research facilities for warm water aquaculture.

## *CAMPUS VISUAL ANALYSIS*

As mentioned earlier, the most striking visual aspects of the Campus are its rich topography and lush vegetation, both landscaped and undeveloped. As clearly evident in Figure 2.14, the entire northeastern half of the campus is bordered by large tracts of virgin land.

No less noteworthy are the original campus buildings, whose scale, texture, materials, positioning and orientation complement the natural beauty and enrich the visual fabric. The careful positioning of these buildings on top of the hills provide view corridors between buildings and vistas across the Campus and adjacent City.

In Figure 2.14, areas were identified as visually attractive for their combination of architecture and landscaping. Most of these areas fall within the main campus, where an abundant landscaped greenery permeates the area. The visually



unattractive areas were labeled as such for detracting from the visual quality of the campus. These included large surface parking areas without any landscaping and clusters of temporary structures or poorly designed buildings.

There are four principal entrances into the campus: two primary ones off Calle Post and two secondary ones off PR-108. The primary entrances are larger and are marked by physical gateways, while the secondary ones are simply lockable gates within the campus fencing. They are all primarily vehicular entrances, although the campus main gate by the old athletic field carefully integrates pedestrians.

Outside the main campus, the visual fabric is not as cohesive. Buildings appear as isolated landmarks with minimal landscaping, poorly integrated with the main campus. In many cases they are accompanied by large unlandscaped parking areas making them visually unattractive and heightening their isolation.

### *VEHICULAR CIRCULATION AND PARKING*

The vehicular circulation and parking system is comprised of multiple access/control points, linked to roadways between scattered surface parking areas throughout the site. Most of the vehicular traffic enters the main campus through the gateway just off PR-2, which by default has become the principal gateway into the campus. Adjacent to this gateway is the General Library parking area, where the majority of students park. From the old main gate, off Calle Post, vehicles move slowly along the old campus roadways, winding their way through the varied topography and dense building fabric of the main campus.

On the perimeter and outside the main campus area, traffic moves faster along the larger and straighter campus roads. It is also along these roadways that pedestrian circulation tends to parallel and intersect with the vehicular circulation, mixing vehicles with foot traffic. This hazardous condition is particularly evident at the gateway points along PR-108, despite efforts to encourage foot traffic over pedestrian overpasses.

All parking on campus is allowed by permit, and available to students, faculty and staff at no cost. The two principal student parking areas are located to the northeast just outside PR-108 and adjacent to the General Library. Most other parking areas, primarily for faculty, staff, and maintenance, are dispersed throughout the campus.

Many parts of the campus roadways are congested during peak morning hours (7 AM-9 AM) and in the early afternoon (11 AM to 1 PM), when classes begin and end. At the existing vehicular entrance gates into the campus, the control and handling of traffic leads to further congestion. These conditions also create a pedestrian/vehicle conflict zone around the entrances. With the current

system, control points are necessary to check parking permits, as well as to direct visitors and other incoming traffic.

Parking poses significant problems on the campus. Although well-planned and integrated into the building fabric, the original parking system of small lots, can no longer support the present parking demands which currently exceed availability by more than double. Students regularly park illegally along PR-108 and around the main campus gate. A new surface opposite the alumni swimming pool was built to accommodate the existing overflow needs, but its distant location makes it a less desirable location.

### *PEDESTRIAN CIRCULATION AND OPEN SPACE*

The main campus is pedestrian oriented with crisscrossing patterns of pathways connecting the numerous open spaces created by the close proximity of the older buildings. In fact, so numerous and well used are these in-between spaces that specific gathering spaces are hard to define. Of particular note, however, are the entrances to the General Library and the Student Center around which groups of students can always be found.

With few exceptions, pedestrian pathways outside the main campus are alongside the roadways, as seen in a comparison of Figures 2.15 and 2.16. The exceptions are pedestrian overpasses, two along PR-108, which provide access over the busy roadway. Few specific gathering spaces could be identified as most of the open space around the newer buildings remains undefined. Although most of the clusters can be accessed by foot, these areas suffers from a lack of clarity for pedestrian movement.

There is a need to address these issues as the campus is redeveloped and decisions regarding open space and land use become critical.

### *SITE UTILIZATION ANALYSIS*

As shown in Figure 2.17, the density of buildings generally decreases as you move away from the main campus. The low density areas are mostly comprised of large buildings surrounded by poorly defined open areas. Large surface parking areas and low-density, unconsolidated facilities plague the underutilized areas of the campus, contributing to campus sprawl. Several of the peripheral cluster areas, although marked as low density, are also not fully utilized, suffering from random development and lack of a coherent strategy for land use. Undeveloped land to the north and west of the Campus, much of it devoted to agricultural research, remains a great potential resource for the Campus and its development should be carefully considered.

## *BUILDING USE ANALYSIS*

The building facilities for the Mayagüez Campus fall into several general categories as illustrated in Figure 2.18. The diagram clearly shows that certain building uses on the campus have developed in a recognizable pattern.

The main campus is characterized by a classical ring pattern around the main quadrangle core. In the first ring are the principal student service and support facilities, including the General Library, the Student Center, the Computer Center, and the Health Center. In the second ring are the academic and research facilities, clustered according to their respective Schools; Agricultural Sciences to the west; Arts and Sciences and Engineering to the east; and The Business and Academic Extension Schools to the north. (See Figure 2.19) The third ring includes administrative buildings and housing. The fourth and final ring includes the recreational and maintenance facilities.

However, because the ring pattern couldn't accommodate the rapid expansion that occurred between the late 50's to the 70's, a new pattern of clustering developed. The nuclear center cluster to the northeast became part of the School of Arts and Sciences; new buildings for chemical and civil engineering were clustered north of PR-108; new recreational facilities were built across the Quebrada de Oro to the west; and Buildings A, B, C, and D, originally designed as a dormitory complex, were clustered to the far west (almost as if these clusters defined the new limits of the campus and the areas between them and the main campus were to be gradually filled in).

## *BUILDING CLASSIFICATION*

As part of the visual survey of the existing facilities, buildings were placed into two categories: historic and visually significant. By this classification, buildings were assigned a relative value that will be later used in determining what development strategy is appropriate for each facility. This classification appears in Figure 2.20.

### *Historic*

These buildings have been identified as having historic value. Current efforts are being made to place these buildings on the National Register. In determining a redevelopment strategy, these buildings would be valued highly and not considered for demolition.

### *Visually Significant*

These buildings are considered significant among campus facilities for good design, interior spatial characteristics, or other architectural criteria. In some cases these buildings would be considered for demolition.

### *Nonclassified Structures*

These structures were classified as being of no great historic or architectural significance. Depending upon campus needs, they may be considered for demolition, rehabilitation or redevelopment.

### ***BUILDING CONDITION ANALYSIS***

Figure 2.21 illustrates the visual conditions of buildings on the campus. With the lack of current facilities inventory and complete information on building systems, structure and maintenance history, only a visual assessment of building conditions was conducted, with some modifications based on conversations with buildings and grounds personnel. The criteria used for analysis was:

- the presence of visible material deterioration, decay and failure;
- the need to replace inappropriate building materials;
- the visible presence of material that have come to the end of their life-expectancy.

In summary, most buildings are in good condition. Some appear fine from the exterior; however, they still need major upgrades due to old construction. In general the residential facilities, Building A, Darlington, and the faculty houses have been neglected.

### **Institutional Efforts to Address Physical Issues**

In order to address pressing needs and to meet current challenges for future growth, the Mayagüez Campus has embarked upon a number of new projects, planning efforts and improvements. The Campus is proposing the construction of three new buildings and the relocation of the engineering schools to the Engineering Quadrangle north of PR-108. It takes as its point of departure the notion of developing a "Complete Campus" using three principle design strategies: the clustering of schools, peripheral parking, and limited vehicular access.

#### *Clustering of Schools*

The plan proposes to cluster related institutional buildings around new quadrangles creating an engineering quadrangle, a science quadrangle, an art

and design quadrangle, a general education quadrangle, an administrative quadrangle, and a buildings and grounds quadrangle. Some of these would result from the reworking of existing building relationships and others though entirely new construction.

### *Peripheral Parking*

RUM is currently conducting an extensive analysis of the parking situation on the Campus. In order to alleviate parking problems, administrators are examining several strategies, including: restriction of on-campus parking to senior level students only; formulation of parking fees; improvement of on-campus transportation; enhancement of city to campus transportation; development of smaller and better distributed lots; and utilization of off-campus parking sites.

### *Access*

When the new PR-108 loop is completed, the existing PR-108 will become an internal campus road, gated at both ends to limit traffic to Campus related vehicles. By doing so, the fences and barriers along that road can be removed to allow greater transition across it. In addition the new internal road could be utilized as another entrance to northern part of the campus, thus lessening the flow of traffic at the Barcelona and Vita entrances.

## *PROPOSED NEW ACADEMIC / RESEARCH FACILITIES*

### *University Center for Fine Arts*

The University Center for Fine Arts is the focal project in RUM's attempt to create a new vision for the future development of the institution, and of the western area of Puerto Rico in general. The Fine Arts Center is envisioned and proposed as both a civic/cultural facility for the western half of the island, drawing patrons from as far as Arecibo and Ponce, and as an academic facility for RUM's music, drama, and visual arts and plastic arts programs. The Center is seen as an important piece in the economic development of the whole western part of the island by becoming a significant plaza for the visual and performing arts, both contributing to the general economy of the area and the area's tourism. The proposed center would include: a main 2,000 seat theater, a 1,000 seat concert hall, a small 800 seat theater, a 300 seat experimental hall and a small cafe theater. In addition the center will house an academic building for the teaching of academic courses related to the fine and performing arts. The building has been programmed at approximately 340 thousand square feet with the cost of construction estimated of \$30 million, not including fit-out. The Mayagüez Campus has contracted a firm of economic advisers to prepare a feasibility study for the project and has established a committee that is seeking federal, state, and private funding for the project.

### *Biology*

Designed to service more than 2,000 students, the new Biology building would consist primarily of classrooms and teaching and research laboratories but would also include space for the extensive animal and plant collections of the biology department. The construction of the building has been approved and funding has been made available for the preparation of the building plans. Construction has been programmed to start in fiscal year 1997-98 at 218,000 square feet at an estimated cost of \$14 million, not including fit-out.

### *School of Business Administration*

A new building for the School of Business Administration is being proposed. The building has been programmed at approximately 118 thousand square feet and the cost of construction is estimated at \$9 million, not including fit-out. The Board of Trustees has scheduled construction to begin in academic year 1997-98.

### *Industrial Engineering and Mechanical Engineering*

The plan envisions the consolidation and expansion of the School of Engineering to the Engineering Quadrangle. The existing Industrial, Mechanical, Electrical, Computer and General Engineering programs would be moved to new facilities in the Engineering Quadrangle. The vacated buildings would become part of the Arts and Sciences department.

### *Buildings and Grounds*

The existing Buildings and Grounds Facilities are being proposed to be moved, although the new location and types of facilities needed is still uncertain.

#### *Additional Buildings*

In addition to those buildings previously described, the plan proposes several other new buildings or additions for future expansion including: a new sports facilities building, additions to the General Library (Computer Center), the Student Center, and the Agricultural Sciences Building.

## **CURRENT IMPROVEMENT PROGRAMS**

Prior to the master planning effort, the Campus had initiated a major capital improvements program totaling close to 83 million in improvement projects. This figure includes the three new buildings proposed for the Campus: the University Center for Fine Arts, the Business Administration Building, and the Biology Building. The complete Permanent Improvement Program 1996-2000 list can be found in Appendix C. The following is a list of major<sup>1</sup> projects:

**Recently Completed Projects**

Chemistry Building (Cost w/o fit-out & equipment). \$20,919,000

**Major Funded Rehabilitation and Expansion Projects**

Construction of New Electrical Substation .....	\$1,350,000
Rehabilitation of Monzón Building (becomes Dean's of students bldg.).....	\$1,000,000
Installation of Fiber Optic Cable.....	\$1,680,000
Remodeling of Esteban Terrats Building.....	\$75,000
Remodeling of the Institute Building.....	\$800,000
Improvements to the Athletic Track.....	\$600,000
Elimination of Architectural Barriers (ADA requirements) \$1,035,000	

<sup>1</sup> With an estimated cost of \$1 million or more.

**Challenges, Goals and Opportunities of Master Plan**

Conclusions drawn from the institutional and physicals analyses, can be summarized as a series of challenges, and goals that need to be met in the planning and implementation of future campus redevelopment. Issues and observations gathered from the site reconnaissance include:

- Mayagüez is a beautiful and well maintained campus.
- The Campus is isolated from the rest of the community by both physical and natural barriers.
- The Campus has seen a transition from that of a small village to one of clusters.
- The Campus is currently examining another transition, from a campus well-known for its engineering to one that is considered more of a "Complete University".

Examining consequences for the campus' natural resources if it incurs this major programmatic change.

- I There is great expansion potential, both physically and academically, for the campus.

Some facilities are reaching utilization thresholds.

- I Questions remain about the role of the Agriculture School within Mayagüez Campus.

Parking on the Campus has become a serious problem. The campus soon be landlocked.

The Business School is in need of expanded facilities.

The biology department needs new and expanded facilities.

There is a need for better access & connections within the Campus and between the campus and its surrounding neighborhoods.

Challenges for the Master Plan include:

Improving access and connections between the Campus and the surrounding areas.

Use of underutilized land and facilities.

New academic and research facilities are needed and the synergy between them improved.

Facility design and management should be improved.

Service and support facilities need to be expanded.

Relocate faculty housing to better utilize land.

Orientation and wayfinding within the Campus must be improved.

Parking and vehicular circulation must be reorganized.

Technology must be updated to meet growing research and teaching needs.



The following goals will be incorporated into later phases of the Master Plan:

Provide better access to the Campus and better connections to its surrounding neighborhoods.

Integrate new facilities and public spaces into the community.

Provide a coherent plan for better utilization of both vacant and underutilized land.

Consolidate parking to improve land utilization.

Organize and separate vehicular and pedestrian traffic, lessening the impact of the automobile on the inner campus.

Create significant green areas and public spaces that connect and orient the pedestrian network, as well as improve the campus environment.

Provide for new academic and research facilities to address both current and future needs.

Explore opportunities to provide on-campus housing to alleviate pressure on the neighborhoods and to create a more residential campus.

Offer remote parking facilities and strengthen connections with mass transit to coordinate the two.

1 Promote cooperative and synergistic activities aided by development of shared facilities.

Develop a building inventory database for facility management and planning purposes.

Develop guidelines to improve both the design and maintenance of campus buildings.

Maintain the primary and historic campus view corridors as well as building and cultural assets.

Begin a program of landbanking for the future.

### **3. PHASE I: CAMPUS FACILITIES PROGRAM**

#### **What is a Campus Facilities Program?**

The Campus Facilities Program looks at the programming requirements for the Mayagüez Campus in a comprehensive, campus-wide fashion. This broad view identifies the magnitude of facility improvements for the entire campus, rather than on a department or school-by-school level, allowing for a more systematic approach to facilities planning.

The campus program developed does not give a detailed breakdown for each individual facility; rather, it provides an order of magnitude for growth in each type of facility making up the Campus. Future programming efforts for individual facilities will be required to outline the specific and detailed needs of each facility, while at the same time considering the objectives of the overall Campus Facilities Program.

As a flexible document, the program will need to be continuously revised to reflect actual needs for facilities as they evolve. This flexibility allows the campus decision-makers to coordinate the changing needs of the Campus as information regarding future funding and land resources, enrollment levels, and developments in other campuses becomes evident.

#### **Target Year Assumptions**

In order to devise a reasonable facilities program for the Campus, assumptions had to be made regarding the growth of the institution. For the purpose of this Master Plan the year 2020 was used as the projection year. Frequently revisiting these program assumptions will be necessary in order to make wise programmatic decisions in the future.

#### *ENROLLMENT PROJECTIONS / ASSUMPTIONS*

The examination of trends in Puerto Rico for population growth and enrollment yields a number of projections:

- The population of Puerto Rico will generally increase\*.

- The Island's traditionally college-age population (18-24 years) will peak around the year 2000, declining slightly to a level projected to remain constant through the year 2025\*\*.

- The percent of the college-age population who will seek higher-education in Puerto Rico will increase, following the trend in the United States, but will remain lower than the U.S. National average.

The increase in continuing education programs and other programs for the older adult population will raise the percentage of the general population that will apply to universities.

The enrollment for the Mayagüez Campus will increase within the University of Puerto Rico system, with the expansion and diversification of its programs, maintaining its status as an excellent undergraduate institution.

A renewed focus on advanced degree programs at the Mayagüez Campus will attract a larger percentage of graduates who now attend other universities on the Island, and abroad.

An aggressive policy of recruiting students, especially foreign students, will increase enrollment as more people choose the Mayagüez Campus for their undergraduate and graduate studies.

\* Source: "Proyecciones de Población por Edad y Sexo, Puerto Rico: Años 1990-2005", a table prepared by the United States Office of the Census and the Puerto Rican Planning Board, Office of Economic and Social Planning, 1990; Comprehensive Self-Study, University of Puerto Rico, Mayagüez.

\*\* The increase in the U.S. has been approximately 2% per year, at a level of 57.5% in 1993. The increase in Puerto Rico has been slightly less than 1% per year, with 36.8% of the college age population seeking higher education in 1993. Source: 1995, 1970, 1980, and 1990 population statistics for the United States, U.S. Bureau of the Census; and enrollment statistics for the United States, U.S. National Center for Educational Statistics; 1970 and 1980 population statistics for Puerto Rico, Puerto Rico Planning Board; U.S. Statistics for 1993, U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 195, February 1993. In the past 25 years of unprecedented expansion and support of higher education, the growth in the percentage of college-age population has been about 1% per year. This growth will most likely be lower in the coming years, as it has begun to level off since 1990. As illustrated in the chart below, a relatively modest growth rate (2% every 5 years) in the percent of those seeking higher education among the college-age population will alone yield an increase in the total number of applicants, even while the total population in this age group declines.

Based on these trends, a reasonable projection can be made that student enrollment will grow from the current 12,000 students to approximately 16,000-17,500 students around the year 2020, as illustrated below. This ranges accounts for a number of variables that could affect enrollment numbers. For example, if a residential component is added to the campus, enrollment numbers would most likely be higher. If on the other hand, reductions in federal financial aid continue, enrollment numbers could be on the lower end. Furthermore, this

increase does not take into account the projected rise the number of older adults seeking continuing education.

For the purposes of this Master Plan, a growth of 17,500 students, a 45% increase in enrollment, will be programmed for. In the event enrollment figures are lower, the rate of implementation will be adjusted accordingly.

In addition, a further breakdown the of individual programs offered at the Mayagüez Campus indicates growth patterns for the different schools. In accordance with current trends at the Campus, projections were made for the individual schools for the year 2020:

<i>Arts and Sciences:</i>	50% increase
<i>Business Administration:</i>	70% increase
<i>Engineering:</i>	50% increase
<i>Agriculture:</i>	35% decrease

After meeting with the Chancellor and other key personnel, an additional set of projections were made, based on RUM policies for the future of the individual schools, in the following areas:

#### Arts and Sciences

This school has doubled in size over the last ten years. This increase is projected to continue, constituting the largest percentage of the student enrollment.

#### Engineering

This school is projected to increase its enrollment, although with tough competition from other engineering schools, increases will not be as great as in the past.

#### Business Administration

Enrollment is projected to rise, although with more schools on the Island offering business administration programs, competition to attract and maintain students will increase.

#### Agriculture

Currently under reorganization of its programs, this school is projected to reverse current trends and increase its enrollment, offering new and more specialized programs.

The largest increase in enrollment affecting all the schools, as seen in the chart below, will be the dramatic increase in continuing education programs at RUM. As today's fields become more technical and specialized, an increasing number of people will be returning to school to further their education and/or

#### **Mayagüez Campus: Breakdown of Population Enrollment**

**Year Arts & Bus. Eng. Agric. Total Cont. Ed. Total  
Science Admin.**

1985	211515934367	5848,659	2498,908
1990	305117523904	5619,268	2059,473
1993	389518124365	70910,781	17410,955
1996	451919834851	94312,296	15612,452
2000	496720955171	96613,199	21313,412
2005	541622075491	99014,104	27014,374
2010	586423195811	101315,007	32715,334
2015	631324316131	103715,912	38416,296
2020	676125436451	106016,815	44117,256
2025	721026576771	108417,722	49818,220

*increase 60% 35% 40% 15% 200%*

It is projected that the share of the total enrollment pool of Puerto Rican students attending the Mayagüez Campus will increase from the current 7% to almost 8.5% in the year 2020. This results from the increasing number of people returning to school; from local students who will chose the campus for their graduate studies, as the programs are expanded and diversified; and for their undergraduate studies as the cost of other schools escalates.

**ASSUMPTIONS FOR FACULTY GROWTH**

Currently, the faculty-student ratio is approximately 1:15. Maintaining this ratio into the future would require an additional 467 faculty members in the year 2020, for a total faculty of 1,179. For the purposes of the Master Plan we will use this assumption. An equal increase in the number of support staff will also be assumed.

**ASSUMPTIONS FOR FACILITIES GROWTH**

Assuming an admissions policy that embraces a rise in enrollment, its increase will have a dramatic effect upon the facilities and infrastructure of the campus. Not all programs or services currently in place are projected to grow at the same rate; some will expand at a greater rate, some will contract. There will be new programs and services in development, especially those related to research, that will also require significant new investment in facilities and resources.

Therefore we are recommending five levels of improvement, to achieve the necessary growth and maintenance of the Campus:

- New Construction
- Redevelopment
- Modernization
- Maintenance

## Demolition

For a complete list of Building Recommendations and growth assumptions refer to Appendix F.

If campus growth assumes a 45% increase of overall enrollment projected by the year 2020, plus an increase factor of about 5% to meet current expansion needs, yielding a facility growth of 50%. Higher increases are used when growth is assumed to be more than the rise of campus enrollment. Space requirements for areas with the greatest potential growth and facility needs, such as research/teaching laboratories, are assumed to require a growth increase greater than the overall campus.

The Preliminary Development Program at the end of this chapter aggregates the growth assumptions of each use and creates a baseline for the generation of campus development scenarios in Phase II.

### *CAMPUS-WIDE FACILITIES PROGRAM ANALYSIS*

The program analysis identifies the growth assumptions and facility space planning standards for each generic type of campus facility, in order to develop the Preliminary Facilities Development Program. Space planning standards for this analysis are based upon well-established and published national standards. They should be looked upon as a general guideline and should be adapted to reflect local conditions, the availability of funds, and cultural considerations which will affect the actual programming of these facilities. The published standards used in this analysis are as follows:

Space Planning Guidelines for Higher Learning, by the Council of Educational Facility Planners, International, July 1985

University Space Planning, by Harlan B. Bareither and Jerry . Shillinger, 1968

Time-Saver Standards for Building Types, Joseph DeChiara and John Callender, Third Edition, 1990.

Functional requirements for facility groups provide useful information in the physical planning and design of facilities. These type of requirements reflect campus-wide functional needs, not specific needs of any one facility. Requirements held in common by most facilities on the campus include the areas:

### *Location/Adjacencies*

Locate similar facilities together, clustering buildings to foster greater synergy of uses.

### *Site and Orientation*

Orient facilities to retain and create important public spaces and view.

Orient entrances to major gathering places and pedestrian routes.

Orient buildings to minimize solar gain.

### *Building Service and Utilities*

Combine service access with adjacent buildings, if possible.

I Provide service areas away from student and faculty areas.

Provide service docks inside building envelopes, if possible.

I Screen utility/transformer installations from view.

### *Building Composition/Spatial Character*

Design facilities to allow for additive growth.

I Design spaces to be flexible in use and purpose over time.  
Design buildings to create shared inner courtyards.

Locate building entrances and public spaces adjacent to major pedestrian routes.

For this analysis, facilities will be grouped as follows:

#### Academic/Research Facilities

Includes classrooms, lecture halls, seminar rooms, teaching laboratories, research laboratories and administrative and faculty office space. It also includes department reception and conference spaces, faculty lounges, studios and other auxiliary spaces.

#### General Use/Service Facilities

Includes facilities used generally by all students and faculty, including libraries, museums, theaters, student service functions, and computer centers.

### Residential Facilities

Student housing, including both dormitory and married student apartment types, and faculty housing.

### Recreational Facilities

Recreational and athletic buildings are included in this group. Athletic fields are also included, but are not calculated in the Preliminary Development Program.

### Power Plant Facilities

Includes all on-campus facilities whose sole purpose is to provide electrical power to the campus.

### Maintenance & Storage Facilities

Includes shops and storage facilities needed to maintain the campus.

### Parking Facilities

Includes structures used for parking of private vehicles.

## **Academic/Research**

### *FACILITY GROWTH ASSUMPTIONS*

Academic and research facility needs, as identified in the Comprehensive Self-Study of the Mayagüez Campus will assume a fairly substantial growth by the year 2020. With a steady increase in graduate students in the past five years, and renewed efforts to focus more directly on advanced degree programs and research, and maintaining the Campus' status as an excellent undergraduate institution it can be assumed that these facilities will grow beyond that of the general increase in enrollment. Planned expansions in both of these areas will significantly tax the already strained current facilities. If by the year 2020, campus enrollment is projected to increase by 45%, and overall campus facilities is projected to grow 50%, it is reasonable to assume that given the recommendations of the Comprehensive Self-Study, the academic and research facilities will increase by 60% over the existing levels.

After reviewing current planning efforts at the Mayagüez Campus, we are proposing the expansion and new construction of several administrative and academic facilities throughout the campus in the following areas:

#### Arts & Sciences

We concur with RUM's decision that the campus is in need of a new Biology Building and recommend its construction. It is, however, unfortunate that the decision to proceed with the Chemistry and Biology Buildings as two separate entities was made. There was an opportunity to develop a state-of-the-art "science center" that incorporated laboratory and teaching facilities for the chemistry and biology programs, as well as other programs, as it has been



successfully done in other universities such as Wellesley College in Massachusetts. But, given the fact that the Chemistry Building is now complete, there is no other choice at this point than to proceed with a second facility. However, it is recommended that the internal organization and dimensions of this building and its parts be designed in a very flexible manner, so that future programs or expansion/transformation of existing ones can be calibrated according to needs and available funding. We are also recommending that the Chemistry Building should, in the future, complete its plans for an auditorium. In addition, we concur that the School of Arts & Sciences needs additional classroom and faculty office space, due to overcrowding of current facilities. Buildings made available by the suggested relocation of the School of Engineering could be rehabilitated for use by this school. New construction is estimated at 230,000-300,000 sf.

#### I Business Administration

The Master Plan recognizes the need for a new facility for the School of Business Administration that has been proposed by RUM administrators. We recommend proceeding with the new Business Administration Building, although the size of the building should reflect future growth trends anticipated for the school. Suggested new construction is approximately 100,000 sf.

#### Engineering

This study agrees with the School's desire and need to consolidate the current engineering facilities. Relocation of the Industrial and General Engineering facilities to the north, closer to the Chemical and Mechanical Engineering Buildings will foster this consolidation and generate greater synergy between uses. It is anticipated that to meet future growth trends for the school there will need to be additional new facilities of approximately 290,000 sf.

#### Agriculture

While this Master Plan focuses on the physical reorganization of the Campus, we feel that both an internal and external restructuring of the School of Agriculture will be necessary to reverse declining enrollment trends.

Within the Campus, in the long term, we recommend consolidation of all facilities, either near the agricultural farms, or the federal experiment stations. This consolidation must be in conjunction with a reorganization of the School's programs, expanding its scope to include other specializations such as food technology, animal sciences, and marine aquaculture.

Similarly, a reorganization of all remote facilities is also necessary. We recommend maintaining the six substations in the different climatic regions of the Island, but consolidating functions of the Agricultural Extension Services wherever possible. We also recommend that RUM officials explore the

possibility of divesting of the facilities in Rio Piedras, and consolidating those research functions and personnel in Mayagüez. These reorganizations could result in a substantial economic savings, and a more productive academic and research program.

It is suggested that in the long term a new building for the School of Agriculture is developed to accommodate classrooms and offices for the school as well as the administrative functions of the agricultural experiment stations, and the agricultural extension service. Its size recommended size is approximately 115,000 sf.

#### Administrative Facilities

Consolidation and streamlining of facilities is envisioned for the future. With several existing buildings becoming available through the proposed campus reorganization, a strengthened administrative core can be developed around the José de Diego Building. A tentative space facility program for administrative functions ranges from 100,000-130,00 sf.

#### Continuing Education

As previously discussed, with an increasing number of people returning to school the need for continuing education programs is projected to increase. Although most programs will be taught throughout the various schools, we recognize the need for a facility that could accommodate specialized programs and administrative functions. We are recommending that the campus set aside approximately 50,000 sf for future use in this area.

In addition, we strongly recommend that RUM considers the development R&D facilities, either on or off campus, to provide faculty and recent graduates with opportunities to work on applied research projects in their fields. This will also allow RUM to diversify its revenue stream, which is of paramount importance given the current trend of diminishing aid from state and federal sources. Suggested new construction is approximately 130,000-150,000 sf.

### *SPACE PLANNING STANDARDS*

Standards for academic and research facilities are broken down into classroom types, teaching laboratories, research laboratories, offices, faculty studios and other ancillary and associated spaces. For some facilities, such as research laboratories, the standards are dependent upon the type of study being done in the lab. For those standards listed in the source as a range, the highest standard is applied in order to allow for greater flexibility for different uses over time. Space planning standards for academic and research facilities can be found in Appendix E.

## **General Use/Support Facilities**

### *FACILITY GROWTH ASSUMPTIONS*

Facilities that provide support and service to students will see the demands placed upon them increase as the campus population continues to boom. The general rate of increase will be assumed to closely follow that of enrollment, with some exceptions:

#### *Student/Faculty Services*

We agree with the Comprehensive Self-Study Report of the Mayagüez Campus, which stated the need to both expand and improve student and faculty services within the campus. In addition, if the decision is made to develop housing within the campus the need for services such as exercise facilities, laundry facilities, and other daily use necessities would be greatly increased. The Master Plan also recognizes that there will be an increasing need for child care as the proportion of women students at the campus continues to rise and as continuing education programs continue to grow. These factors will not only create a demand for more facilities but will also require extended hours of operation. Therefore, to accommodate this growth we are proposing the expansion of the Student Center, relocation of the Faculty Club, and Visiting Faculty Center, and the construction of a Day Care Center on campus. New construction is estimated at 31,000 sf.

#### *Theater/Auditorium*

With no adequate facilities for musical and dramatic performances, we concur that the campus is in need of a Theater/Auditorium facility. The program that is being proposed by Campus officials, however, is seen at this point as too ambitious and extends the current needs of the campus. For this reason the Master Plan envisions a smaller, more flexible auditorium for the Campus. Designed to accommodate both musical and dramatic performances, this new multipurpose facility will contain a main 1200 seat theater (dividable into two or three smaller theaters), a 350 experimental theater, and some additional small ancillary rooms similar to Kresky Auditorium at MIT. This facility will not only benefit the Campus but also act as a hinge between RUM, the City of Mayagüez and other neighboring towns providing residents, students, and faculty with a cultural link to the Arts. Other components and additions to the facility can be reconsidered in the future if the need is demonstrated and/or if outside funding sources become available and a management plan in place. Suggested new construction is approximately 66,000 sf.

### *General Library*

The Master Plan agrees with RUM's proposed expansion of the library to accommodate computer facilities, as well provide additional space for collections and administrative functions. We are also recommending that smaller libraries throughout the campus be consolidated into the main library whenever possible. To remain current with today's technological advances, it is important that the campus also improve and expand connections with other universities and local libraries via the internet. This will not only increase the amount of information available to students, but will reduce the need for additional large expansions to the library. Estimated expansion to the library is approximately 20,000 sf.

For the purposes of this Master Plan, the overall aggregate growth assumption of all general use/support facilities will increase approximately 50%.

### *SPACE PLANNING STANDARDS*

Since these facilities widely vary in their requirements, only space planning standards for selected uses have been provided. For service facilities, Appendix E aggregates uses typically found in a student union, excluding food service uses like cafeterias.

### **Residential Facilities**

#### *FACILITY GROWTH STANDARDS*

Currently the Mayagüez Campus provides no on-campus housing. The few residential structures that do exist house faculty, visiting professors, and some graduate and scholarship students. With the expansion of many of the academic programs, the Campus is expected to experience a substantial growth. To keep a competitive edge within the UPR system and other universities, the RUM decision-makers should consider developing a residential component to the campus. For this reason, two housing scenarios were developed.

#### Scenario One

Housing is developed for 10% of the projected enrollment of students and 5% of the projected increase in faculty. All housing will be provided on-campus.

#### Scenario Two

A larger residential component is programmed. Housing is developed for 20% of the students and 10% of the faculty. In this scenario, 50% of the housing for students and faculty will be on-campus and 50% will be provided off-campus in the surrounding neighborhoods, requiring coordination with the City.

The benefit of adding a residential component is that the Campus will be able to attract a wider range of students. More foreign students might be encouraged to attend the Mayagüez Campus, both graduate and undergraduate, if on-campus

housing was provided for. In addition, the master plan recommends that campus officials explore private/public partnerships, or nonprofit organizations that might be willing to undertake the construction and management of such facilities. The table below shows the two scenario options for the campus.

### *SPACE PLANNING STANDARDS*

The standards used for this analysis were based on standards from Time-Saver Standards, and previous studies commissioned by the Río Piedras Campus. These standards suggest that for a variety of dormitory types, a area of 285 net s.f. per student is a reasonable guideline. This figure includes corridors, and common rooms but does not include larger cafeterias or other uses that may be categorized as a support or student service use.

For married student apartments, standards suggest 300-350 sf per student, or 600-700 sf per apartment.

For faculty housing, more traditional apartment unit standards were assumed ranging in size as follows:

- one bedroom: 700 sf.
- two bedroom: 950 sf.
- three bedroom: 1,350 sf.

### **Recreational Facilities**

#### *FACILITY GROWTH ASSUMPTIONS*

Recreational facilities at the Mayagüez constitute approximately 94,000 sf. These facilities include a coliseum, swimming pool, baseball and softball fields, basketball and tennis courts, a track, and a gymnasium. Currently they are in good condition, with only improvements and upgrades planned for the future.

Applying the facility standards listed below we find that RUM falls within the suggested range for recreational facilities. Therefore, at this time we are suggesting that the Campus develop a program of continued maintenance and expansion of current facilities and that they build two additional baseball/softball fields, some additional courts for tennis and/or basketball, and two small recreational buildings to accommodate an increased residential component to the campus. New construction is estimated at 4,000 sf. In addition, we recommend that the campus reserve approximately 40,000 sf of land, that in the long term could become the site of an additional new recreational building.

## *FACILITY STANDARDS*

The table below indicates a significant range of results one would get by applying different standards for athletic facilities. These, however, are only initial planning guidelines for a more in-depth study of these facilities in the future.

### **Recreational / Physical Education Space Planning Standards**

#### ***Baseline Enrollment SF per Total SF Need of Mayagüez Student Area Needed***

**CEFPI Standards** 20,000 12,296 5 80,000

### ***University of Illinois***

undergrad	11510	12.1	138,120
25% grad	197	12.1	2,364
15% staff	185	12.1	2,239
			<b>142,723</b>

### ***Time-Savers Standards***

*undergraduate students* 12,296 16 **184,160**

### **Power Plant**

#### ***FACILITY GROWTH ASSUMPTIONS***

Currently, the campus electrical substation and the central plant, are being expanded. This expansion, according to campus officials should be sufficient to handle the programmed growth of the campus. For planning purposes it is cautious to assume that site and building requirements may increase by 25%.

## ***FACILITY STANDARDS***

Planning for power plants or other similar facilities are generally not addressed through the use of general standards. The needs of these facilities vary greatly from one institution to the next and are highly dependent upon the various technologies used and the requirements of the utility service. Planning for such facilities will also depend upon the actions taken in other parts of the Campus and the status of upgrades to the current systems.

## **Maintenance and Storage Facilities**

### *FACILITY GROWTH ASSUMPTIONS*

A physical inspection of the Campus's maintenance facilities indicated the facilities to be in fair condition, and concurred with findings from the Comprehensive Self-Study Report which determined that the campus has outgrown its maintenance capabilities. According to the standards listed below, current facilities are slightly less than what they should be. As such, a growth increase of 25% will be programmed. But, before RUM undertakes any expansions or upgrades of maintenance facilities, we recommend that campus officials explore the cost/benefit of outsourcing some maintenance operations to outside firms, as many other universities are beginning to do.

Currently the maintenance facilities ( 77,00 sf of buildings, and 175,000 sf of site area) occupy a key area within the heart of the campus, and although they were originally placed at its periphery, as the campus grew the facilities became incorporated into the core. The master plan suggests the demolition of existing structures and relocation of these facilities to allow for better utilization of the current site. New facilities would be relocated and expanded, once again to a peripheral site, in order to accommodate current and future growth of the campus. In addition, campus security will be relocated to the new facilities. Estimated new construction is approximately 90,000 sf (buildings only).

### *FACILITY STANDARDS*

For the purpose of planning maintenance facility needs, the Council of Educational Facility Planners, International, suggests that the space requirements for maintenance shops and storage should be based on 8% of the total space being maintained, including both site area and buildings. When this guideline is applied to the aggregate of existing facilities, it indicates maintenance uses could be expanded 50%.

## **Parking Facilities**

### *FACILITY GROWTH ASSUMPTIONS*

Currently, 60% of the 12,296 students at the Mayagüez Campus have parking permits. With the increase in the number of students attending RUM, the facilities to handle and store cars will also grow. In addition, should the campus become more residential in the future it would also increase the demand for long-term parking. As the table below indicates, with a combined total of 9,771 permits issued and only 3,900 spaces available, 1 space exists for every 4 permits. If one were to project this rate into the year 2020, the number of permits will rise to over 14,000, with the need for 5,700 spaces.

For master planning purposes, a total program of 5,700 spaces has been established, providing for a maximum of 4,000 cars on campus and 1,700 in remote parking areas. It should be noted, however, that this requirement is based on an unconstrained demand, assuming no change in the policies regarding on-campus parking and no action to discourage the use of private vehicles. Campus decision-makers should address this issue both from an environmental and a physical planning point of view.

There are a number of ways that RUM administrators can deal with an increase in on-campus parking demands. For example, they could encourage the use of public transportation by furthering its efforts to expand and strengthen services to and from, as well as within the Campus. Currently the Municipal Government of Mayagüez is providing bus service from the city to the Campus. We are recommending that Campus officials work with the City to use and develop remote parking lots to handle the increased parking demand on campus. Working together could provide convenient alternatives to both students and faculty who currently commute by private vehicles.

Another approach might be to charge a fee for the parking permits. This would help confine the growth of private vehicles on the campus, and would encourage a more pedestrian and transit-oriented campus.

## *FACILITY STANDARDS*

Standards for at-grade parking and parking structures is 335 s.f. per vehicle.

### **Preliminary Development Program**

The Preliminary Development Program table is illustrated in Figure 3.1. It indicates growth increases for campus facilities and the new building area generated for the year 2020. Applying a reasonable growth increase to the current area of each use, identifies approximately a 73% aggregate increase to the Campus by the year 2020. The residential component constitutes the largest percentage of the projected increase, along with major expansions proposed for academic/research facilities.

Because the program is based on a series of assumptions, actual growth patterns and trends for the year 2020 that are uncertain, one might ask if the program will ever materialize as projected or if it might be dramatically different. The answer to these questions are unpredictable. Changing policies and goals of the Mayagüez Campus will affect program requirements. For example, should campus officials emphasize graduate and research studies, the need for specialized facilities would expand, while the requirements for other buildings might see a reduction. Should administrators develop aggressive policies regarding on and off-campus parking, the program for parking and other related



facilities may decrease. On the other hand, if RUM were to develop a residential component to the campus, the need for student and support/services, could be dramatically increased.

Forces outside the Campus can also change programming criteria and requirements. Should the University of Puerto Rico decide to consolidate other campus' within the system, the increase in demand for certain programs and overall enrollment at the Mayagüez Campus could be increased. Similarly, if other private universities or campuses were to offer a more competitive education package, enrollment patterns could see a slight decline. In addition, the adoption of new teaching methodologies, such as holding classes via the internet and computer, or using videos to teach would call for a reevaluation of space requirements throughout the campus and UPR system. If students could be taught from home or at computer centers the need for classrooms and large lecture halls would be reduced, allowing for more flexible, multiuse spaces and more tutorial rooms.

Clearly, the implementation of the Development Program is dependent on a wide range of internal and external factors which must be raised and discussed. Because it is based upon reasonable assumptions and not arrived at in a scientific manner, the program must also be updated yearly with current assumptions and design criteria. As such it will continue to provide RUM officials with a reasonable framework in which to conduct future planning and make decisions. Once actual demand is established, then space and funding should be made available to accommodate any necessary growth.

The Preliminary Development Program, Figure 3.1, indicates a major growth in facilities for the Campus by the year 2020. In order to achieve such a substantial growth a series of actions need to be incorporated in the Master Plan and its implementation strategy. This will happen through a combination of demolition, new construction, redevelopment, modernization and maintenance projects. In addition a general improvement of site/ landscapes elements throughout the campus will be necessary. Some projects have already undergone extensive programming analysis and others still remain undefined. The Preliminary Development Program will therefore serve as a basis to test not only the necessity of these projects but also their sizes within the context of a preferred development scenario, discussed in the next chapter.

USE (sf)	EXISTING of Existing	PRELIMINARY PROGRAM	
		Floor Area (sf)	Floor Area
Academic / Research		1,031,725	1,650,760
Support Facilities		291,669	437,504
Residential Facilities		150,841	603,364
Recreational (buildings only)		93,512	135,592
45%			
Maintenance / Storage		86,275	107,842
<b>Total</b>		<b>1,654,022</b>	
			<b>2,935,062</b>
Parking (SF Area)		1,306,500	542,360
Parking Spaces at Grade		3,900	1,000
Parking Spaces in Garage(s)			3,000
Remote Parking			1,700
Parking Structure (SF)			1,005,000
Research & Development			130,000

#### 4. PHASE II: DEVELOPMENT VISION

A critical step in fostering RUM's status as an excellent undergraduate institution is to develop the campus in a coherent and efficient manner that allows for the necessary growth and expansion defined in the Preliminary Development Program, yet respects and maintains the natural features of the site and accomplishes the goals stated in Chapter 2. To achieve these objectives, a development vision has been conceived to direct growth of the Campus in its physical planning decisions for the next 25 years, and beyond.

##### Methodology/Approach

The development approach outlines as reorganization strategy to direct future growth of the campus. The approach included the following steps:

- Identify development areas
- Define campus organizational principles

- Develop a campus organization diagram
- Restructure vehicular, pedestrian and parking systems
- Suggest an expansion concept for open space and vegetation
- Test and evaluate alternative facility sitting options
- Identify recommended improvements to existing facilities
- Articulate campus development scenario(s)

### **Development Areas**

The Preliminary Development Program, Chapter 3, estimates a 1.5 million square foot increase to the campus by the year 2020. Such an ambitious program will not be possible under current land constraints. The relocation of PR-108 offers the campus an opportunity to achieve these goals. Once PR-108 is relocated a new boundary for the Campus can be established. For this reason we have analyzed several directions in which the campus can grow and have identified four possible areas of expansion in the west, north, and east. As illustrated in Figure 4.1, Development Areas, the four recommended parcels for expansion include the following: -

#### Parcel 1

Located to the east of the campus, this 28 acre parcel of land is owned by the Federal government and is used as experimental agricultural farms.

#### Parcel 2

This land, constituting 16 acres, is currently owned by RUM and is the site of the former Nuclear Center.

#### Parcel 2a

This 9 acre parcel is Federal Experiment Station land

#### Parcel 3

Located in the north of the campus, this 19 acre parcel is also Federal land.

#### Parcel 4

This 32 acre parcel of land, located in the west is currently RUM property and is the site of campus maintenance and agricultural farms.

Land acquisition to the north would require extensive negotiations with Immaculata School, who now owns the land just east the Federal Experimental Farms. For this reason we are recommending that RUM explore opportunities,

as soon as possible, to acquire the three parcels of land to the northeast and east of the campus. This land acquisition will facilitate campus growth in a coherent and rational manner into the year 2020, and beyond. Additional land acquisitions to the north should be explored in any case, because it is in the best interest of RUM to control the level of possible urbanization that will inevitably occur along PR-108, and at the same time it is important to retain campus growth flexibility for the post 2020 period.

## **Campus Organizational Principles**

### **Clustering**

Similar building uses should be grouped or clustered to create a synergy by their proximity. Buildings should be located and organized to allow for future expansion within the cluster, preventing unfocused and uncoordinated growth, and providing more clarity within the campus environment.

### **Compactness**

Facilities should be organized to retain the compactness of the campus, minimizing travel distances for the pedestrian whenever possible.

### **Gateway**

A system of clearly defined vehicular and pedestrian gateways should define the boundaries of the Mayagüez Campus, establish better movement both from within and to and from the campus, and provide a coherent connection to the surrounding neighborhoods.

### **Pedestrian Movements**

Pedestrian spines should be developed that flow from the mayor access points to various academic, recreational, service, and housing facilities throughout the campus. In addition, this network should be largely separated from vehicular traffic, creating a safer and more pedestrian friendly environment.

### **Campus Commons**

A major series of public green spaces should be developed to provide a framework of civic spaces for the enjoyment of the visiting public and the RUM community. As pedestrian-oriented spaces, open space areas should serve as the crossroads for pedestrians, the common should assist wayfinding and give continuity to the campus.

## **Building Design and Organizations**

Buildings should be designed to incorporate the following elements:

### **Flexibility**

Buildings should be able to expand or contract its various functions in order to adapt to new uses in the future.

### **Standardization**

Buildings should promote standardization of its materials and systems in order to realize the greatest efficiencies and cost-savings.

### **Connections**

Designs should foster interconnections between neighboring uses.

### **Technology**

Buildings should be designed to capitalize upon both emerging and well-established technological advances in building materials and systems, as well as in information delivery systems, transportation and other technologies.

### **Lighting & Orientation Signage**

A distinct and coherent lighting and signage/graphic system that clearly identifies the pedestrian system from the vehicular one should be designed. System standards should be developed to be consistently applied throughout the campus and should complement and not compete with the variety of architecture on campus.

### **Landscape & Artwork**

Elements should be designed to reinforce places of importance throughout the campus and to improve the coherency within it. In addition, elements should be carefully chosen to highlight certain areas of the campus. For instance, gateways deserve special treatment, as do the major roadways of the campus.

#### **Campus Organization Diagram**

While the original campus layout was designed as a village with a town center and gateways, given that many new buildings have been planned outside of the center, new design concepts need to respect the village but offer alternatives that would allow the campus to be organized in a cohesive manner. The Campus Organization Diagram, Figure 4.1, illustrates the proposed organization of primary uses for the campus. Future activities would be reorganized along the

existing east-west axis new clusters would develop, like pearls on a string, that incorporate and reinforce the focal point around the main campus green between the library and student center. All four schools, along with support and recreational facilities would have a presence along the spine. Defining the two ends would be the housing facilities in the west, and the R&D facilities in the east. A secondary north-south axis would contain additional facilities and clusters that would feed into and reinforce the main campus spine. In addition, four new gateways to the campus would be established providing better access and circulation throughout the campus. The new organization is designed to respect the natural features of the site, preserving areas of dense vegetation and floodplains.

The proposed organization provides many advantages, including the following:

- It accommodates the growth of academic facilities in a rational, focused development pattern within the campus core;
- It avoids fragmentation of academic and support/service facilities, consolidating their uses;
- It provides a strong cognitive identify for the campus layout; and
- It reorganizes facilities along the main campus spine, creating a continuity of movement and uses throughout the campus.

### **Vehicular, Pedestrian and Parking Systems**

As part of the need to reorganize the campus, a system of clearly defined vehicular and pedestrian gateways are proposed. In addition to the two historical gateways located off of Calle Post, four new vehicular gateways along PR-108 were established to lessen the flow of traffic at the two main entrances, and to enhance circulation throughout other areas of the campus. Four pedestrian gateways, two near Mayagüez Terrace, are also identified bringing pedestrians through highly recognizable and pleasant connection into the campus, strengthening the pedestrian network system.

Adjacent to and near the campus gateways, a series of parking structures and at-grade lots are envisioned to limit vehicular traffic to the periphery of the campus. As illustrated in Figure 4.1, Roadways & Parking, cars entering and exiting the campus are immediately directed to the various parking areas and then back to the exit, never entering the core of the campus. Limiting parking within the core allows for better land utilization and expansion of academic facilities and reduces vehicular traffic, creating a safer and more pedestrian friendly environment. This network is largely separated from interactions with vehicular traffic, sharing its

path only with emergency and service vehicles. The advantages of this type of system is that it reduces congestion within the core of the campus; organizes access to parking and future growth areas; and separates the realms of the pedestrian system from the vehicular one.

### **Open Space & Vegetation**

In accordance with the stated goals of the Master Plan, there is a need to respect and maintain the natural features of the campus. The design concept (Figure 4.1, Open Space & Vegetation) preserves areas of dense vegetation, while enhancing and expanding the green spaces throughout the campus in the following areas:

In the long term, an expansion of the major gathering place on campus, between the library and student center, is envisioned. Currently this is the main focal point on campus and should maintain its prominent status.

Further to the east, along the main spine, a new common, or plaza is envisioned to lessen the density of the area.

Another new common is envisioned in the western half of the campus. It acts as a terminus to the academic spine and as a gathering place for proposed residential facilities nearby.

Near the main gate, a new common will replace the current parking lot, creating a more attractive entrance to the campus, and another public gathering place.

Finally, two new commons are envisioned in the western quadrant of the campus, along the main spine. This continues the pattern developed along the spine, intertwining facilities and major civic spaces along the "necklace".

In addition, the commons are linked via tree lined paths and roadways, utilizing plant materials as the connective elements. Rows of royal palms will line the primary and secondary spines of the campus, reinforcing the pedestrian framework and circulation of the campus. Another important element of the campus is the Quebrada de Oro Canal that runs through the heart of the campus. Currently it remains relatively undeveloped, but could become another major gathering place on campus along its edges and this design idea should be explored in future planning phases.

### **Alternative Facility Siting Options (Figures 4.2-4.3)**

To achieve campus reorganization, a number of alternative sites were tested for the following projects:

## **Biology**

### Site 1

This area is the current programmed site for the new Biology Building. We feel that this is an appropriate site because it is along the campus spine, close to the Chemistry Building, and can be easily accessed from the new gateway off PR-108.

### Site 2

We determined that this site is not appropriate because it is too isolated from the other science facilities, and the land is not currently owned by the campus, and acquisition could take some time, thus postponing the implementation of this priority project.

### Site 3

We felt that this is also a good location for the new Biology Building because it is located in the heart of the campus, although it may be better suited for other facilities.

### Recommendation

Site 1 was chosen as the most appropriate location for its proximity to other sciences facilities, and its convenient access from PR-108.

## **Engineering**

### Site 1

This site is a good location for new engineering facilities, because of its proximity to the current Civil and Chemical Engineering Building, but the land is not currently owned by RUM and acquisition could be difficult.

### Site 2

This site is not an appropriate location because it is too isolated from the rest of the campus, and would increase walking distances for students. In addition, this land is not currently owned by the campus.

### Site 3

We believe that this site is too removed from the other engineering facilities, and could be better suited for other facilities.

### Site 4

We concluded that this site, although requiring some relocation of existing facilities, could be a good location because of its proximity to the other engineering facilities, and along the main campus spine.



### Recommendation

Site 4 was chosen as the most appropriate area for its location in heart of the campus and proximity to other similar facilities.

## **Business Administration**

### Site 1

This is the programmed site for the new School of Business Administration. We believe that is not an appropriate location for the new school because the location is off of the proposed main spine, and would be located in an area that could become too densely developed if both the Biology and Business Administration Buildings are located next to one another.

### Site 2

This is seen as a good location, although the area may be better suited for other uses.

### Site 3

This is a very good location, giving new School of Business Administration a prominent location along the campus spine, connecting both ends of the campus.

### Site 4

We also concluded that this could be an appropriate location for the new school, serving as a landmark at the main campus gate although because of the topography of the area, siting could be difficult.

### Recommendation

Site 3 was chosen for its location along the campus spine, and its connection with other nearby facilities.

## **Agriculture**

### Site 1

This is the current location of the School of Agriculture. We felt that this is not a good location because its too removed from the experimental fields on either ends of the campus, and with the tight location there is little room for future expansion.

### Site 2

We believe that this is a good location, because of its proximity to the experimental farms, although the campus does not currently own the property, and acquisition could take some time.

### Site 3

We also concluded this is a very good location, because it is located near the experimental fields. In addition, it is located along the campus spine defining the western end of the campus.

### Recommendation

Although sites 2 & 3 are both good locations for many of the same reason, site 3 was preferred because the land is currently owned by RUM and relocation of the school could take place sooner.

### **Parking**

#### Site 1

We believe that this is a good location because it is located at the main entrance to the campus.

#### Site 2

This is not seen as an appropriate site, because once Calle Post is widened the parking structure will be facing a busy street with obvious traffic implications, in addition the site topography is very steep making sitting difficult.

#### Site 3

We felt that this is a good location because it can be easily accessed from PR-108, and is near the future R&D facilities.

#### Site 4

We concluded that this is not a good location because it is in the heart of the campus, and the land could be better utilized for other uses.

#### Site 5

This is seen as a good location because it near the new northeast entrance to the campus, just off of PR-108.

#### Site 6

Because of its accessibility from PR-108, and location near the new northern gateway, this is also seen as a good location.

#### Site 7

This location is another good possibility, although the land is not currently owned by RUM and would require negotiations with the Immaculata School, who now owns the land.

#### Site 8

We felt that this is a good location, because it would allow for parking in the western quadrant of the campus, near the academic and housing facilities.

### Recommendation

Sites 1,3,5,6 & 8 were chosen for their locations near the access points to the campus, maintaining parking at the periphery.

### **Housing**

#### Sites 1,2,3,4 & 5

We felt that these are very appropriate locations for new residential facilities. They mark the end of the campus spine, are near both academic & recreational facilities, and Mayagüez Terrace, where many of the current students now live.

#### Site 6

It was felt that this is not a good location because it is too close to Calle Post, and there is limited development opportunity and a lot of traffic noise.

#### Site 7 & 8

This could also be a good location for housing, although is at the outskirts of the campus. In addition, this land is currently owned by the Federal government and would require acquisition from the Federal government.

#### Site 10 & 11

This is also another good possibility for the development of housing, although it is at the edge of the campus, and might be better served if housing were developed through public/private partnerships than by the campus.

### Recommendation

Sites 1,2,3,4 & 5 were chose as appropriate locations because they are within the boundaries of the campus; located along the main spine; and within short walking distance of most campus facilities.

### **Theater/Auditorium/Performance Center**

#### Site 1

We believe that this is a very good location for the Theater/Auditorium, it has a very prominent location at the main entrance to the campus, and is located just off of Calle Post close to parking, making it easily accessible for nearby residents. In addition, it will serve as a landmark for the campus.

#### Site 2

Located in the heart of the campus, along the main spine, this is also seen as a very good location, creating a gathering place in the center of campus for students and residents.

### Site 3

This is not a appropriate because the location is too remote, and not easily accessible to local residents. In addition, location at this site would require land acquisition from the Federal government.

### Site 4

We concluded that this is also a good site because it is located along the campus spine, and accessible from the western entrance to the campus, although does not serve the community very well.

### Site 5

This is also another good possibility for a new theater/auditorium because of the accessibility and location, although once again, the area may be better suited for other uses.

### Site 6

We felt that this is not an appropriate location because the land constraints and the topography of the area.

### Site 7

Another good possibility is to locate the facility off-campus, near the existing Sports Arena, creating a partnership with the City of Mayagüez.

### Recommendation

Sites 1 & 2 were chosen as the most appropriate site for their location, prominence within the campus, and accessibility.

## **Recreation**

### Sites 1 & 2

We believe that this is a very good site for recreational facilities because it is located near the proposed housing facilities, and along the campus spine.

### Site 3

This is also another good location, although the area may be better for other uses.

### Site 4

We concluded that this is another possible location, although it would require land acquisition by RUM.

### Recommendation

Sites 1 & 2 were chosen for their locations along the spine and proximity to the proposed housing.

## **Recommended Improvements to Existing Facilities**

Once the siting of new facilities were determined, it was necessary to determine the level of improvements to existing facilities so that these would adequately function in the future.

### **REDEVELOPMENT**

Buildings that has been renovated but then utilized for a different purpose or use, including the following:

<b>Building #</b>	<b>Current Use</b>	<b>Suggested Use</b>
118	Agriculture	Continuing Education
114	Agriculture	Faculty Club
113	Chemistry and Computer Center	Administration
111	Biology	Administration
109	ROTC	Arts & Science
108	Mechanical Engineering	Arts & Science

### **MODERNIZATION**

Buildings that will require substantial upgrading in the future:

Industrial Engineering Building  
General Engineering Building  
Jose de Diego Building  
Dean of Students Building  
Chardon Building  
Physics, Geology, and Marine Sciences Building  
Building B (Security & Small Claims)  
Building D (Multipurpose Hall)  
Building C (Agricultural Extension)  
Building A (Hotel)

### **MAINTENANCE**

Buildings requiring only deferred and scheduled maintenance projects, including:

Visual Arts & Printing Building  
Swimming Pool  
Agricultural Farms & Greenhouses  
Coliseum  
Power Plant  
Central Plant (HVAC)  
Civil Engineering Building  
Chemical Engineering Building

Telephone Switchboard Building  
Gymnasium  
School of Nursing Building  
Chemistry Building  
General Library  
Health Clinic  
Student Center  
Chancellor's Residence  
Visiting Faculty Club  
Athletic Field Building  
Huyke Residence\*  
Athletic Residence\*

## **DEMOLITION**

Assigned to buildings that are obsolete, inadequate, temporary in nature, or inappropriate sited. These include the following:

Estaban Terrats  
Security Building  
Entomology Laboratory  
ROTC-Airforce  
Faculty Residence 1#, 2#, 3#, 4#, 5#, #6  
Nuclear Center  
Energy Center  
Business Administration (Scenario B only)  
Continuing Education (Scenario B only)

\*In the long term, RUM administration may want to consider demolishing these facilities.

## **Development Scenarios**

Utilizing the campus organization principles and concepts developed and adhering to the Preliminary Development Program, three initial scenarios were created for the Mayagüez Campus (See Appendix G). These scenarios varied building use, size, location and the extent of improvements to existing facilities. After initial discussions with the RUM Chancellor, Scenario Two was chosen for further refinements. Two new scenarios, A & B, were modified with only minor differences between the two. Figures 4.5 & 4.8, illustrate and landscape enhancements. Figures 4.6-4.7 & 4.9-4.10, indicate the new building uses and the associated schools/colleges.

## **COMMONALTIES**

The following identifies those elements that each of the scenarios hold in common.

### **Campus Organization**

Both scenarios organize future growth of the campus along a main spine or “necklace”. Locating academic, support, recreational and residential facilities along this spine creates a continuity of movement and uses from one end of the campus to the other.

### **Gateways**

Four new vehicular and pedestrian gateways are established to enhance circulation on the campus.

### **Parking**

Both scenarios provide for three new parking structures, and three surface lots located at the major access points to the campus. In Scenario A, the parking structure located near the western entrance is slightly smaller than in scenario B, to allow for a buffer zone between the proposed parking and the residential facilities envisioned for the area.

### **Campus Commons**

Six commons are created and/or enhanced in each scenario. Two commons are developed in the western quadrant of the campus; two in the eastern quadrant; one near the main entrance; and two commons near the student center and library. In Scenario B, the demolition of the Biology and Continuing Education Buildings allows for a greater expansion of the common between the Library and the Student Center.

### **Biology Building**

In both scenarios the Biology Building is located in the eastern quadrant of the campus, near the new Chemistry Building. Scenario B changes the orientation of the building to create a stronger connection to the new R&D facilities.

### **Theater/Auditorium**

Both scenarios include a new Theater/Auditorium facility to be located near the main entrance to the campus, creating a landmark for the campus.

## **Business Administration Building**

This new building is located along the main campus spine in the western quadrant of the campus. Scenario B changes the shape of the proposed building to better accommodate the site.

## **Engineering**

New engineering facilities are located along the northern spine of the campus in a linear organization. Scenario A&B vary the configuration of buildings, although the overall square footage remains constant.

## **R&D Facilities**

In both scenarios, new facilities are located on the site of the former Nuclear Center in the eastern quadrant of the campus.

## **Library, Student Center, & Chemistry Building**

The expansion of these facilities is sited for in both scenarios.

## **Continuing Education Building**

Both scenarios include the redevelopment of the Agriculture Building, into a continuing education facility.

## **Faculty Club**

In both scenarios, the Old Institute is redeveloped as a faculty club.

## **Maintenance Center**

Current maintenance facilities are demolished, and new facilities are relocated to the periphery of the campus next to the northern gateway.

## **Power Plant**

Expansion of the current power plant is envisioned for the future, if necessary.

## **Day Care**

Both scenarios provide for a day care facility, near the center of campus.



## **ROTC**

A new and expanded facility for Army and Airforce ROTC is located in northern quadrant of the campus.

## **Residential Facilities**

New and redeveloped residential facilities are located in the eastern quadrant of the campus, at the terminus of the main campus spine.

## **Recreational Fields**

With the addition of a residential component to the campus, both scenarios envision three new baseball/softball fields, as well as some additional basketball and tennis courts.

## **DIFFERENCES, SCENARIO A**

### **Agriculture**

In this scenario, new facilities for the School of Agriculture are located in the eastern quadrant of the campus, at the terminus of the main spine. This solution brings the agricultural facilities closer to the federal experimental fields in the east. If, in the future this land becomes the property of RUM, locating the School of Agriculture in this area will allow for the future expansion of both facilities and experimental farms.

### **R&D Facilities**

Development of these facilities are envisioned as one large, interconnected building that wraps around a central courtyard. The facilities are designed to be built in stages allowing for incremental growth.

### **Residential Facilities**

Located in the western quadrant of the campus, the multi-purpose hall and surrounding buildings are redeveloped back to their original use as residential facilities. Three new housing developments are designed to surround the newly renovated facilities, creating a stronger presence in the area. In addition, a fourth housing development is envisioned just to the north of these facilities, next to the proposed parking structure. The new facilities will house both students and faculty.

## **DIFFERENCES, SCENARIO B**

Agriculture: Scenario B locates new agricultural facilities in the western quadrant of the campus, at the other end of the campus spine. The Visual Arts and Printing Building is redeveloped and incorporated into the design of the new facilities. The advantage of this site is its close proximity to the school's experimental farms.

### **R&D Facilities**

These facilities are designed as three separate structures located around a new plaza/common in the area, providing a visual connection with the new Biology Building.

### **Residential Facilities**

As in Scenario A, the multi-purpose hall and surrounding buildings are redeveloped into residential facilities for both faculty and housing, and infilled with three new residential developments. But, in Scenario B the fourth housing development is located further south, in the area of the agricultural farms.

## **Conclusions**

Both Development Scenarios satisfy the programmatic goals and objectives established for the Campus. Figure 4.11 illustrates the program comparison of Scenarios A and B. Due to that fact that actual growth is uncertain and should be monitored, some facilities may exceed the Preliminary Program requirements. Therefore, both scenarios depict the built-out potential for the campus meeting future space needs to the fullest extent possible. In addition, the scenarios provide RUM administrators flexibility in making decisions regarding individual facility size, use, and location, the organization of open spaces, and future growth.

Although the Master Plan does not advocate one Development Scenario over another, based on an initial evaluation Scenario B may have the advantages:

- Locating the School of Agriculture in the western quadrant of the campus allows the school to be closer to the experimental farms, and does not require land acquisition for its relocation although it will be further from the School of Arts & Science, where first and second year students take most of their classes.
- In the long term, with the demolition of the old Business Administration and Continuing Education Buildings, the main plaza between the library

and Student Center will be expanded, reinforcing the centrality and historic importance of this place.

- Changing the orientation of the new Biology Building will create a stronger relationship with the R&D facilities to the east, and reinforce the importance of the new common developed in the middle of the cluster.

Although, it should be noted, because both scenarios are very similar in nature it is possible to combine certain elements from either scenario. For example, Scenario B could be chosen as the preferred scenario, using the stated location the Business Administration Building, but retaining the original design from Scenario A. The School of Agriculture could be sited at either location in both scenarios. Also, if Scenario A is chosen, the fourth residential development, now sited in the north could be located further south as in Scenario B.

## **5. PHASE IV: IMPLEMENTATION**

This chapter offers suggestions regarding phasing and implementation strategies for the Mayagüez Master Plan. These suggestions are intended to provide a framework for ongoing discussions; to demonstrate the decision-making process necessary for the selection and realization of a future development scenario; and to show how development which occurs in the earliest stages of the plan's implementation, will affect future planning decisions and will set the stage for the overall organization of major campus components.

In order to reach a desirable future plan and to address the immediate needs of the Campus, RUM Administrators must begin to make choices. The first of these decisions pertain to projects that have been given precedence by RUM administrators. They are categorized in two groups, maintenance / improvement projects and priority projects, ranging in size from small repair and remodeling jobs to new, large scale investments such as the Biology and Business Administration Buildings. The status of these projects, as well as some of the choices regarding them are described below.

### **Maintenance / Improvement Projects**

A list of 40 projects, known as maintenance\ improvement projects, was developed by RUM during the past years. As part of the master planning effort, this list was reviewed and Comunitas suggested that certain projects be put on hold, as they may conflict with the long range development goals for the Campus--becoming obsolete in the near term or precluding optimal future planning opportunities.

Now, in conjunction with selecting a preferred scenario, the list needs to be updated and the status of projects put on hold must be reevaluated in the context of long range planning. Those projects which have already received funding; which are determined as meeting immediate needs and/or demand; and which support the master plan can proceed in the most expeditious manner possible. Some projects may still conflict with the future planning objectives and should remain on hold. Others may be added to the list as maintenance issues or new programs emerge.

The current list of maintenance/improvement projects can be found in Appendix D. Please note, however, that some of these projects have not been graphically represented in the master planning documents, although their aggregate has been reflected in the Preliminary Development Program.

### **Priority Projects**

Based on the desires expressed by RUM to date and on the results of the master planning study, a list of priority projects has been identified for completion in a first development cycle. These projects have been described in the previous chapter and include the Biology Building, Business Administration Building, School of Engineering Expansion, Maintenance Facilities, parking, on-campus housing and miscellaneous projects such as the Central Library and Student Center. The location and design for some of them have already been established, while others still require site selection and/or further scope definition.

Decisions for the siting of certain priority projects, although dependent in general terms on the layout of a given facility, must also be made in the context of a preferred development plan. As such, the Master Plan presents Development Scenarios A and B (Figures 4.4 and 4.5) as two possible solutions for the layout and configuration of future development. However, the criteria which ultimately needs to be analyzed by RUM to make optimal siting decisions will be the result of answers to the following questions:

Is the site for a given facility immediately available?

Does construction of the facility require the on- or off-campus relocation of an existing use?

Does construction of the facility have major traffic implications?

Does the facility require parking nearby?

Is the land in question better suited to other uses?

I Is it appropriate for the facility to be adjacent to their functions in order to foster greater interaction or shared use of certain types of spaces?

Does the site allow for future growth or expansion?

What are the facility's maintenance and/or accessibility requirements?

I Does siting the facility have implications with respect to pedestrian circulation, view corridors or open space planning?

The key priority projects that require immediate decisions and/or further planning efforts are highlighted below.

### *Biology Building*

The proposed site for the Biology Building is currently used for parking. This parking will need to be replaced prior to construction of the new facility.

### *Business Administration Building*

The location for the Business Administration Building is the same in both Scenario A and Scenario B. The RUM administrators must, however, fine tune its program and determine whether to utilize an existing design for the building, adapt its design to the currently proposed site, or develop a new layout that would better fit the context of the Master Plan, and perhaps be more flexible for future expansion of the facility.

### *School of Engineering Expansion*

Even though the configuration of this expansion is defined in the development scenarios, it is imperative that a detailed study of actual facility needs be conducted to ascertain the extent of its construction in the first development phase.

### *Maintenance Facility*

The existing maintenance facilities on the Mayagüez campus must be relocated to make room for more appropriate uses at their present locations. Should the proposed location for this facility (at the North Gate) not become available immediately, the RUM administrators might consider an alternative site on- or off-campus.

### *Parking Garages*

There is a pressing need to construct one new garage to replace the parking spaces that are lost as other priority projects commence. The RUM

administrators need to identify which of the three garages proposed in the Master Plan scenarios could be built immediately. This decision should be based on land availability and on the schedule for rerouting PR-108.

### *Housing*

The introduction of housing on the Mayagüez Campus is listed as a top priority by RUM administrators. The extent of housing to be built in the first development phase and the term of its financing remain to be determined. In addition, it is important to establish what development entity would construct these facilities.

### *Miscellaneous Facilities*

The last of the priority projects includes the expansion of two major support facilities: the Central Library and the Student Center. The Master Plan has confirmed the location of these facilities as suggested by the RUM administrators. At this time, the program and specific needs of each facility should be reassessed and finalized so that construction can proceed as soon as funding is available.

## **SECONDARY PRIORITIES**

Once the projects described above are completed or their location and/or scope established, the preferred site plan and program of the Master Plan can be refined. Also, a new set of priorities and consequently choices will emerge, for example:

Redevelopment/reuse of facilities that have been replaced such as the former Agriculture buildings, Monzón building and ROTC facilities.

Expansion or modernization of existing facilities including the Power Plant and recreational facilities.

New building projects such as parking garages, academic/research buildings and the School of Agriculture.

Infrastructure improvements such as reconfigured or new campus gateways which may require negotiation with the city and community; improved or new campus roads; landscape restoration; pathway renovations to meet ADA standards; more uniform signage, lighting and security systems.

Improvements to the landscape and the creation outdoor common areas identified in the Master Plan. This will, more than any other action, transform the overall image of the campus.

Following each development or planning stage, the Master Plan will need to be updated given decisions related to physical planning, funding, and growth policies. As such, the Master Plan acts as a "decision tree" which provides RUM with a realistic framework in which to test choices.

## **Phasing**

As part of the master planning study, sample phasing plans were developed for both Scenario A and Scenario B (Figures 5.1 and 5.2). They are intended to demonstrate how RUM may arrive at an ultimate build-out over a twenty-five year period. In preparing the phasing models, the following criteria was employed in order to make reasonable projections regarding the sequence of development.

- Needs and demands
- I Land availability
- I Consistency with the Master Plan
- I Incremental development cycles

The phasing plans include the priority projects that have been discussed previously in this chapter, and assume completion of the maintenance/improvement projects that do not conflict with long term planning goals for the Campus. They are presented in three development phases of approximately eight years each, a duration considered reasonable given the typical planning, design and construction stages for university-scale projects. The phasing plans also reflect a legitimate pattern for financial planning and fund-raising programs which need to be developed and tested by the University.

In addition, the phasing plans depict the redevelopment of key facilities or sites that will occur prior to, in conjunction with, or following each new development phase. For example, once the new Business Administration facility is completed in the first development cycle, its former building in the central campus can be reused or removed.

It is important to note that the phasing diagrams are simplified. As such, they group a series of projects in each of three phases and make assumptions regarding their implementation sequencing. Although it is reasonable to conceive that a series of projects can begin during each eight year cycle, their completion may, in fact, be staggered over a longer period depending upon land acquisition, design and construction schedules, or availability of funds.

The following section describes the model phasing plans for development Scenarios A and B and highlights the key differences between them (refer to Figures 5.1 and 5.2).

## ***PHASE I***

The first development phase designated in Scenario A and Scenario B (Phase I) are relatively consistent, with minor variations in the form or location of a few buildings. The plans include all projects that were identified as "priorities" and assumes that they might be sequenced in six stages:

1. Development of at-grade parking (#12) on the northeast edge of the campus along the proposed route of PR-108. This parking would replace the spaces lost in the central campus as land is made available for other priority projects. Also included in stage 1, the new Biology Building (#10) could be immediately built at the corner of the current PR-108 and Caobos Street.
2. Development on the northern edge of the campus providing a new Campus gateway, maintenance facilities (#13) and a parking structure (#11).
3. Construction of the new Business Administration Building (#4) and the first phase of the School of Engineering, along the west side of the new academic spine.
4. Expansions to the Central Library (#6) and Student Center (#7).
5. Completion of the Chemistry Building Auditorium (#9) and the first cluster of housing on the west side of the campus (#2).
6. Relocation of recreational/sports facilities (#3) in order to free land for the subsequent development cycle, Phase II.

Towards the end of Phase I, the RUM administrators must reach a decision regarding the location for the new School of Agriculture (#1). Its siting options constitutes a key difference between Scenario A and Scenario B. With Scenario A, construction of this facility will take place in Phase II, southwest of the central academic campus. In Scenario B, however, the School of Agriculture would be located on the western end of the academic spine, and could be developed incrementally, beginning in the first development phase.

## ***PHASE II***

Phase II is also similar in both Scenarios A and B with minor exceptions. Most notably, differences between them consist of the organization of housing on the west side of the site, the placement of the ROTC Building and the School of Agriculture. Phase II development can be broken down into five stages:

1. Completion of new facilities for the School of Engineering (#5), construction of a second parking structure (#11) and development of landscaped commons along the west academic spine (#24).



2. Completion of the School of Agriculture (#1), either in a new location as per Scenario A, or as an expansion of existing facilities in Scenario B.
3. Development of a new Theater/Auditorium near the South Gate of the campus (#19), redesign of sports/recreational facilities (#3) and construction of a new Daycare Center (#20).
4. Consolidation and relocation of ROTC facilities in the vicinity of the North Gate.
5. Construction of a second housing cluster (#2), and in Scenario A only, development of a common plaza between the Biology and Chemistry Buildings (#24).

As Phase II nears completion, the RUM administrators will be faced with the decision whether to begin development of an R&D Center (#15). This facility would be located across from the new Biology Building, on a site that will require demolition of existing structures. Should decision-makers choose not to develop R&D facilities, or should they opt to develop such facilities off-campus, the site designated to R&D in the Master Plan can remain as is or be programmed for other new uses.

### *PHASE III*

As the final development phase of the Master Plan, Phase III primarily consists of site improvements and the completion of projects started in earlier phases. New building projects in Phase III include a third parking structure shown in both Scenario A and Scenario B and new facilities for the School of Arts and Sciences (Scenario B only). Phase III is conceived in four stages:

1. Completion of the southern campus entrance and roadway improvements. This consists of construction of a third parking structure (#11), development of a new South Gate (#23), restoration of landscape along Quebrada de Oro, expansion of the Power Plant (#22) and the completion of landscape along the west end of the new academic spine (#21).
2. Construction of a third housing cluster (#2).
3. Completion of the R& D Center (#15) and the School of Arts and Sciences (#16).
4. Development of an East Gate to the campus including new at-grade parking lots (#12) and site improvements.

A final component of Phase III is shown in the Phasing Plan for Scenario B only. It consists of the expansion of the central plaza on the campus, adjacent to the Chemistry Building. This improvement is also possible within development Scenario A; however, it requires demolition of the existing Continuing Education Building (Hidalgo) and the former Business Administration Building. In this event, uses programmed for these buildings can be redeveloped south of the proposed School of Agriculture. As such, it should be noted that the development scenarios offer the flexibility to mix and match the components of the Master Plan, and that modifications will not jeopardize or change the basic organizational principles established for the Campus.

### **Cost Estimates**

As part of the master planning effort, a preliminary cost estimate has been developed for the priority projects planned between 1996 and the 2020. It was not prepared to give a detailed cost projection for each individual project, but rather to provide an order-of-magnitude figure, for planning purposes, given the implementation of either possible development scenario. A number of assumptions are built into the estimates, including:

#### Development Scenario

The cost estimate is based on Development Scenarios A and B only, as shown in Figures. 4.5 and 4.8.

#### I Facility programs

The estimate is based on a calculation of square footage for each project, multiplied by a fixed unit cost (per square foot) for each facility type. However, because the development scenario represents facility sizes only to test whether a preliminary development program can be satisfied, they must be considered in their proper context. Should the program for any one facility be refined, its size and estimated cost will change.

#### Units costs

Some unit costs have been provided by UPR prior to beginning the Mayagüez Campus Master Plan. Additional unit costs were selected and adjusted from *Means SF Costs*. All prices are in 1996 dollars and have **not** been escalated for inflation.

#### I Extras

The cost estimate provides a planning figure for the basic construction of facilities. It does not provide for landscape and site improvements surrounding each facility; soft costs such as architectural and engineering

fees; or a budget to outfit buildings with furniture or specialties (e.g. computers, laboratory equipment, etc.).

#### Renovation

The Master Plan identifies many facilities for redevelopment or modernization. It is assumed, for estimating purposes, that the total area for each of these facilities will be improved at an average unit cost of \$45 per square foot. This figure may vary for buildings that require historic restoration.

#### Fixed costs

Some priority projects are already funded such as the Biology Building and the Business Administration Building. Many of these projects which were previously included in RUM's budget for permanent improvements (\$83,225,250) are now included in the Master Planning Cost Estimates as fixed costs. See Appendix D for a detailed listing of these projects.

The tables on the following pages summarize the preliminary cost estimates. They are organized by development cycle and facility type for both proposed development scenarios. Supporting worksheets are provided in Appendix G.

As indicated in the Master Plan, it is conceivable that the total area of campus facilities will increase by 1.5 million square feet over the next 25 years. With the assumptions that have been made regarding the costs of new construction, redevelopment, roadways and site improvements, reaching the optimal Campus build-out may cost upwards of \$175 million, excluding maintenance and operating costs. To achieve such a goal would require an average of \$7 million per year capital investment over a 25 year period--a substantial amount for any institution. Given that the financial resources allocated for education at the federal level is shrinking, and that the Mayagüez Campus is only one part of an Island-wide system, there is a need to make aggressive efforts in diversifying the revenue stream for the Campus, and for the entire UPR system, as well. This can be brought about in several ways, both within and outside of the University. For example, the University could:

Increase public and private research partnerships. Such partnerships can benefit private organizations because research and development programs can be costly and require staffing resources and facilities. For the University, these programs offer attractive opportunities with respect to faculty advancement and the support of graduate programs. They also help to develop a synergy between the University and the professional community.

#### Expand alumni and philanthropic fund-raising.

Although this type of fund-raising is not the traditional model in Puerto Rico, it is becoming more and more necessary among institutions of higher education. Efforts should be increased tremendously to gain financial support

from alumni and friends of the University that have been successful in Puerto Rico and abroad. Monies raised from these sources could augment scholarship funds and support facility development.

I Expand continuing education programs.

The cost of continuing education programs are frequently paid for by employers and provide immediate cash revenues. These programs also help to raise the level of utilization of University facilities; to provide added challenges for faculty members; to increase the University's exposure to the changing needs of the work force; and to provide a social benefit to Puerto Rico.

I Reduce operating and maintenance costs. Streamlining the operations and maintenance systems for the University can potentially increase efficiency and expand available resources. For example, outside maintenance vendors may be able to provide custodial services to certain facilities at a much lower cost than University staff. Standardization of building components will simplify maintenance procedures and could reduce storage needs.

I Lobby for increased Federal education spending.

The University can inform the legislative system of the current and future needs for higher education, and the anticipated costs for meeting them. If done successfully, the University can ensure that monies will be allocated well in advance of its development priorities.

Implementing the scenarios illustrated in the Development Vision (Chapter 4) will require a substantial financial commitment. Decisions made regarding the redevelopment of the Mayagüez campus will require thinking in conjunction with the planning initiatives at other campuses, as well as at other institutions in Puerto Rico and the Caribbean.

### **Preliminary Cost Estimate**

Scenario A

### **Preliminary Cost Estimate**

Scenario B

### **Next Steps**

This Master Plan is a positive first step in developing a new approach to the growth of a wonderful campus. It outlines measures that will foster synergy between the various schools within it; that give it a much improved and welcoming physical environment; and that allow the RUM administrators to make wise decisions. By breaking traditional patterns of incoherent growth and carefully planning development on its remaining and new land holdings, the

Mayagüez Campus will maintain its scholastic competitiveness and provide the following:

- I Increased visibility and interaction with the surrounding Mayagüez community and the Island.
- I Organized site circulation and parking that allows for traffic flow and access while minimizing impact upon the campus.
- I The development of a coherent strategy of academic and service facility improvements, providing additive growth and flexibility.

The provision of green space and improved pedestrian environments for the use and enjoyment of future generations of students, faculty and the community.

- I A campus that is more residential, encouraging active campus life, the optimal utilization of campus facilities, and a greater participation in the social, cultural and economic life of the Mayagüez community.

To meet these goals, seven action areas have been identified which define the critical path for successful implementation of the Master Plan, and more effective future planning endeavors.

#### 1. MASTER PLAN FRAMEWORK

Through ongoing discussion and debate, the RUM administrators must articulate and refine the master plan framework, as well as confirm key planning policies and principles with respect to:

- I Sharing and clustering of academic facilities.  
Strong functional relationships between facilities will help to increase building utilization factors; to optimize efficiency; and to promote greater interaction between University departments.

#### Development of open space.

Open spaces may consist of a series of campus commons, courtyards or plazas--serving as places for gathering and social interaction as well as aesthetic enjoyment. Buildings can also be developed and articulated to form public spaces which increase synergy between facilities.

- I Organization of parking and circulation.  
A coherent framework for circulation will reduce traffic on the campus, strengthen wayfinding, and enhance pedestrian connections. Parking

consolidation, especially at the perimeter of the Campus, will further reduce congestion and help to separate pedestrians and vehicles.

I Expanding on-campus housing.

Increasing the residential component of the Campus will enhance the quality of life at the University and will reduce the volume of commuters. Also, the program for student services as well as for parking will be greatly affected.

Improvements to existing facilities.

Recommended improvements to existing facilities include: redevelopment, modernization, expansion, maintenance or demolition. The extent and timing of these improvements must be considered in the context of the Master Plan, and not just on a facility by facility basis.

List of priority projects and phasing.

Some of the projects identified as priorities are already underway. Other projects can be ordered according to the needs of the University and realistic financial cycles.

## 2. *DEVELOPMENT PROGRAM*

The Preliminary Development Program must be revised in light of current or future curriculum reorganization efforts. These efforts will include decisions to expand certain specialized programs, such as continuing education and/or the School of Agriculture, which may not change the aggregate of the future program, but may significantly affect certain components of it. The development program must also be tested against the needs and expansion programs for other campuses system-wide.

## 3. *CIRCULATION*

Conduct a detailed traffic analysis for the entire Campus. This study would first survey and record existing circulation patterns, travel times and key destination points. Then, using a realistic future development plan, the analysis could test the feasibility of the proposed roadway system and the location of key facilities, such as parking structures. The study might also address:

- I standards for travel times and distances around the campus
- I circulation for maintenance and emergency vehicles;
- I accessibility for disabled persons (ADA standards);
- I location of parking entrances/exits as well as fare collection, security points or gates;

- | traffic patterns during peak hours and during events (e.g. large theater performances);
- | optimized pedestrian circulation, especially to/from parking garages, between facilities, and crossing busy roadways; and
- | priorities and phasing for planned roadway improvements (e.g. PR-108).

#### 4. CITY

The University and the City share a number of goals and can work together to achieve them. Liaison efforts with the City should be increased to coordinate immediate parking and housing policies and the future potential for:

- | joint-development of remote park and ride facilities which reduce commuter traffic at the Campus and encourage the use of public transit;
- | restricting off-campus student parking that overcrowds and deteriorate local roads;
- | greater interaction between the Campus and Mayagüez with safer, more attractive connections;
- | infrastructure improvements, such as revitalized streets and sidewalks, new landscape and lighting, and better public services; and
- | privately developed off-campus housing with adequate public transit connections.

#### 5. LAND BANKING

A critical element to ensure the successful implementation of the Master Plan is an immediate program of land acquisition and land banking. Specifically, RUM must secure ownership of three key parcels illustrated in Chapter 4, Figure 4.1. These parcels are all located along the proposed PR-108 and include:

- | 30 acres (site 3) instrumental to development of the North Gate and for facilities that must be moved out of the central campus, prior to the first development phase;
- | 9 acres (site 2a) needed for parking to support new and relocated academic/research facilities; and
- | 30 acres (site 1) required for the construction of the new East Gate, the new School of Arts and Sciences and future expansion.

It is also advisable that RUM initiate negotiations to acquire any additional land surrounding the proposed PR-108 loop, especially on the east side. This will provide land needed to support the School of Agriculture if it is developed according to Scenario A, and will provide RUM with optimal long-range planning flexibility.

## 6. *CENTRALIZED PLANNING*

### *Planning Process*

The *Campus Planning Process* established by the UPR Central Administration outlines an organized and methodical planning effort for Campuses in the university system. This process should, however, be expanded to include critical feedback on the assumptions, goals and development programs at each campus throughout the system.

To this end, the University should encourage individual campus to produce an expeditious master plan (like that presented in this report) which allows major growth policies and financial issues to be discussed both locally and at a system-wide level. This will enable the University's central planning office to address major growth policies in the context of planning visions; to resolve funding issues; and to track statistical and operational information. The outcome of which can then be incorporated into the longer-range, methodical planning efforts for each campus, as detailed in the *Campus Planning Process*.

### *Planning Data / Institutional Analysis*

Detailed facility data can also become centralized. Currently, UPR has a clearinghouse which can provide some information regarding the physical facilities at its various campuses. However, further information regarding the actual performance, utilization and condition of these facilities is maintained at the local planning offices at each Campus.

In order to better manage future planning efforts, track operational statistics throughout the University, and match planning efforts with funding cycles, UPR should undertake a system-wide computerization of planning information. Such a system would provide a standardized format from which to extract critical facility information, track ongoing planning efforts, and inform future programming and technology development as well as facilities' maintenance issues.

In addition to providing internal planning information, the University could also maintain centralized statistics for other Universities, including staff size, organizational structure and new programs being offered. This data would allow the University to evaluate its competitiveness in light of current trends. It would also allow each individual campus to perform a "reality check" of its own operations.



Mayagüez has already developed a comprehensive database of its operations, more than other campuses in the UPR system. Its computerized information could, in fact, be referenced as a standard in establishing a centralized databank for UPR.

## *7. BUILDING AND GROUNDS MAINTENANCE*

Current maintenance operations at the Mayagüez Campus are organized and will continue to be effective with the development of new facilities on the north side of the campus. Ultimately however, the future needs for maintenance facilities at Mayagüez will depend on the extent of services that will be maintained on-site. Should the RUM administrators outsource some or all of its maintenance operations in the future, this component of the program may change significantly.

As the RUM administrators embark upon significant redevelopment at the Mayagüez campus, a comprehensive evaluation of its maintenance operations and policies should be conducted. In doing so, the following issues must be considered:

- RUM's ability to provide cost-effective and efficient maintenance functions; designing new facilities around strong maintenance and operational principles (e.g. standardization of building components or approaching maintenance on a system-wide basis rather component-by-component);

- staffing size, organization and level of specialization;

- whether some functions (e.g. custodial services or security) can be provided by outside vendors more efficiently; and,

- what is an acceptable level for the condition the RUM physical plant.

## **Conclusion**

The Master Plan and implementation strategies presented in this document suggest a reasonable approach for RUM administrators regarding expansion and reorganization of the Mayagüez Campus. They provide for an incremental process of decision-making to ensure development of realistic facility programs. They also guide physical growth that will likely satisfy the needs of the Campus well beyond 2020, and reinforce its image as a high-quality institution within the UPR system and outside of Puerto Rico.