# Arkansas Research and Technology Park: A Physical Planning Study

Fayetteville, Arkansas







UNIVERSITY OF ARKANSAS COMMUNITY DESIGN CENTER

## TABLE OF CONTENTS

Introduction to the Study.....ii

Context.....1

The Natural State
Site Context
Gateways to the City
Major Roads
Significant Properties
Existing Site Properties
Proposed Site Boundary

Northwest Arkansas City and University Gateway at Razorback Road Vehicular Access **Significant Properties Existing Site Properties** Proposed Land Acquisitions







Hydrology Soil Analysis **Current Ownership** Utilities Fayetteville Zoning

Topography

#### 

Future Development Neighborhood Commercial

Guiding Principles **Creating Community** Wayfinding Wayfinding

**Conference Hotel** 

Neighborhood Residential

**Guiding Principles** Gateways





Walks and Seating Public Art Outdoor Dining Outdoor Spaces Preserving Natural Beauty Green Reserve Trails and Greenways Shaded Parking Transit System Transit System Transit System Street Standards Street Standards

Proposal A	Urban
Proposal B	Campus
Proposal C	View
Proposal D	ARTP Assembly Co

Summary.....

Appendix.....

Architectural Quality **R+T** Building Types **Building Types Study Proposal Statistics** Sources Acknowledgments

**ARTP Arkansas Research and Technology Park** Fayetteville, Arkansas March 1, 2002

Inventory......16



#### Enhanced Stream Corridors



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•	•	•	•	•	•	•	•	•	.68	
-		-				-			.72	)







# INTRODUCTION TO THE STUDY



UofA Engineering Research Center and Genesis Incubator; Fayetteville, Arkansas

The Arkansas Research & Technology Park will serve as the bridge between university research and its commercialization creating new opportunities for university-industry partnerships that engage our students and faculty.

Collis Geren, Vice Provost for Research, Dean of Graduate School

## The Case for Development

In 2001, the 2010 Commission, assembled by Chancellor John White, developed a compelling case for the University of Arkansas in Fayetteville to serve as the premier research institution in the state of Arkansas. A key argument advanced in the commission's report was the economic benefit to be gained by major investment in technological research. The report was broadly promulgated and widely supported within the political arena and the public at large. As part of a broad-based effort to advance the research agenda at the University of Arkansas, the Board of Trustees allocated funds for the first new research facility as a part of a Research and Technology Park to be constructed on UA property.

A Research and Technology Committee, chaired by Engineering Dean Otto Loewer, with broad representation from the community as well as the university, determined that the most feasible location for the proposed Arkansas Research and Technology Park (ARTP) was the ENRC site. Its location, infrastructure, and reputation for innovation and research recommend this property as the logical setting for the new research complex. The selected site for the new building is on land where the UA Engineering Research Center (ENRC) and Genesis Technology Incubator programs are now located.

The development of the proposed ARTP is conceived of as an institution that will bring economic and social benefits to the entire state of Arkansas, drawing upon the experience and expertise of the many research entities now housed on the UA Campus. At a time of increasing global competition, technological knowledge and applicability are at a premium. Arkansas and the United States cannot hope to maintain economic leadership without investment in technological research leading to new and innovative products and processes. The ARTP represents an essential first step in harnessing and making public the intelligence and capabilities of the university.

#### Arkansas Research and Technology Park Study

Supported by funds from UA Graduate School, the City of Fayetteville, and private institutions, an intense two-month economic and planning study was undertaken by two university centers, the University of Arkansas Community Design Center (UACDC) and the Center for Business and Economic Research (CBER). The focus of the study was twofold: first and foremost to make a compelling case for the ARTP, based on economic and physical

precedents, and then to offer projections as to the physical and economic viability of the new complex. CBER has prepared a detailed companion report to this document, which describes the physical characteristics and design parameters of the proposed ARTP.

## **UACDC** Planning and Design Proposals

- and zoning.
- sive master plan.

## **CBER Economic Analysis**

The economic analysis and market feasibility for the proposed facility are covered in a companion report, prepared by CBER, entitled, "Arkansas Research and Technology Park: A Strategic Analysis."

## UACDC

Planning and design studies prepared as part of the study include:

• Inventory and analysis of the existing physical context of the ENRC site, buildings, topography, property lines, circulation patterns, existing tree cover and vegetation, and other factors affecting development. As part of the study, the relationship of the ARTP site to the major road system and centers of civic activity were identified.

Identification and evaluation of adjacent property parcels with respect to feasibility for proposed development and future expansion of ARTP.

Inventory and analysis of both existing ENRC and adjacent property with respect to infrastructure, hydrology, utilities, soil characteristics,

• Preparation of alternative conceptual master plan studies, summarizing their various attributes. Studies include estimates of required areas, circulation patterns, entry and exit points, general landscaping recommendations and some indication of physical design quality.

Visualizations of the several conceptual schemes, illustrating how the natural assets of the existing site, together with adjacent property acquisitions, can be enhanced through a well-developed comprehen-

• Descriptions and illustrations of desirable architectural design characteristics that need to be considered and incorporated in the project. These have been selected as having particular reference to the ARTP to be constructed in its location in Fayetteville.

## THE NATURAL STATE

#### **Arkansas**<sup>1</sup>

Arkansas is a unique tapestry of mountains, plains and fertile delta. Our heritage is part Western frontier, part Ozark pioneer and part Old South. In Arkansas, you can spend your time enjoying contemporary cityscapes or spectacular natural beauty. Each of our four, distinct seasons brings a refreshing new look.

## **Ozarks Region**

The Ozark Mountain Range was formed from a heavily eroded plateau, pushed up eons ago and carved out by hundreds of streams over thousands of years. Nature worked wonders and today the diversity of these highlands is endless.

Some of the most scenic rivers and majestic lakes in America are here to enjoy. Beaver Lake is renowned for its trophy largemouth and striped bass, and its 32,000 acres of clear, blue water to swim, ski and explore. Fish the White River for rainbow and brown trout, or canoe the Buffalo National River.

#### Northwest Arkansas

Recreation is an important feature of life in Northwest Arkansas. Play golf on one of many challenging courses. Play tennis on championship caliber courts. Soothe the Ozark Roadways aches of an active lifestyle with a massage and spa treatment.

Galleries, studios, antiques, fine arts and one-of-a-kind shops are an irresistible temptation. Fine restaurants, diverse nightlife, marvelous music and unique festivals all contribute to a diverse and satisfying lifestyle.

Attractions include the University of Arkansas, Walton Arts Center, Jones Center for Families, The Arts Center of the Ozarks, Shiloh Museum, several local museums and other cultural and entertainment venues.

<sup>1</sup>*Thanks to www.arkansas.com, from which this description* was adapted.





Buffalo National River







Arkansas Tapestry



*Circle indicates approximately 3-hour driving radius* 





George's Inc. Headquarters; Springdale, Arkansas

Northwest Arkansas metropolitan area

## UACDC

## NORTHWEST ARKANSAS

#### **Business Context**

International and national corporations are headquartered in Northwest Arkansas, including Wal-Mart, Tyson Foods, Hudson Foods, J.B. Hunt, Bekaert Corporation, Cargill Corporation and George's Inc. These companies produce, manufacture, and distribute goods and services not only for the state of Arkansas, but also for the entire world.

Northwest Arkansas Regional Airport (XNA) provides commercial air carrier service to the region. It is served by American Airlines/TWA, Delta/Atlantic Southeast, Northwest Airlink and U.S. Airways, with direct flights daily to Chicago, IL; Dallas, TX; Memphis, TN; St. Louis and Kansas City, MO; Charlotte, NC; Atlanta, GA; and New York LaGuardia. General and corporate aviation and charters run from airfields in Bentonville, Rogers, Springdale and Fayetteville. XNA is located 45 minutes to the north of the proposed ARTP site, and Fayetteville Drake Field is only 5 minutes to the southeast.

The region does not yet have a research and technology park to facilitate knowledge transfer between the university and corporate community. The ARTP will secure an important role in stimulating growth in a knowledge-based economy.

- 1 Wal-Mart Stores Inc. -20,800 employees
- 2 Tyson Foods Inc. -7,843 employees
- 3 Arkansas Dept. of Education 5,955 employees
- 4 J.B. Hunt -4,402 employees
- 5 University of Arkansas 3,411 employees
- 6 George's Incorporated -2,300 employees
- 7 Washington Regional Medical 2,111 employees

## SITE CONTEXT

Two factors essential to the creation of a successful research and technology park are close proximity to a research institution and availability of local amenities.

## Proximity to University of Arkansas

A major sponsor of the ARTP is the University of Arkansas. Located only 5 minutes from the heart of campus, the ARTP will benefit from shared facilities and equipment, faculty expertise, and an educated work force in the form of students and recent graduates.

## Proximity to Amenities

An attractive and vital downtown makes Fayetteville a desirable community in which to live. Mixed-use development on Dickson Street hosts thriving retail businesses, restaurants, housing units, and entertainment venues including nightclubs and the Walton Arts Center. The downtown Square has restaurants, retail stores, banks, professional services, and the newly constructed Town Center convention hall.

The proposed ARTP is located close to two city parks, proposed multi-use trail sites, and a number of restaurants and businesses. We anticipate that the economic development influence of the ARTP will create a zone of desirable development from I-540 to the campus, and from Razorback Road to Hwy 71B.



City of Fayetteville Property

University of Arkansas Property

City Parks

Extended Public/Private Development Zone



Locations of institutions and amenities

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Downtown Square: home of the Fayetteville Farmer's Market



University of Arkansas' University Hall – Old Main – constructed 1873-75





Razorback Stadium under construction, 2001 – expected capacity at completion 80,000

Fayetteville – Population 58,047<sup>2</sup> There's something special about Fayetteville. Whether it's the beauty of the city or the comfortable, hometown feeling it conveys, there is a uniqueness that sets Fayetteville apart from other cities in the region.

A friendly college town filled with easy hospitality, Fayetteville sits at 1,400 feet above sea level. The surrounding hills and valleys offer spectacular scenery throughout the year. Fayetteville enjoys four distinct seasons, with an average of 218 sunny days per year. The average temperature in January (generally the coldest month) is 37, and the average temperature in August (the hottest month) is 78. Relative humidity, on average, is 55%. Fayetteville's average precipitation is 44 inches of rain and 6 inches of snow per year.

Fayetteville's most significant educational achievement came in 1871 when it outbid the rest of the state, with a total pledge of \$130,000, for the establishment of the University of Arkansas. The university opened its doors in Fayetteville in 1872, and the city continues to be the flagship campus of the UA system.<sup>3</sup>

The University of Arkansas is a nationally competitive student-centered research university serving Arkansas and the world. The university offers a wide range of degree programs, including advanced technical degrees in science and engineering disciplines. From these programs, the university produces both highly qualified graduates and a substantial amount of intellectual property – much of which is commercially viable.

Old Main housed the first classes taught at the university. Completed in 1875, this twin-towered brick building is a stately landmark, and can be seen from many areas in the city.

The Arkansas Razorbacks are perennial SEC contenders in football, basketball, baseball, track and field, and other sports. The university's men's and women's sports programs and athletic facilities rival those of any school in the nation.

<sup>2</sup>2000 Census data <sup>3</sup> Thanks to www.fayettevillear.com, from which this description was adapted.

Fayetteville Courthouse



## **CITY AND UNIVERSITY**

## University of Arkansas – 15,226 Students<sup>2</sup>

## GATEWAYS TO THE CITY

The southern gateway to the City of Fayetteville is the intersection of I-540 and Cato Springs Road, which turns into Razorback Road. Razorback leads directly to the University of Arkansas campus, forming a strong physical link between the ARTP and the University. In addition, Highway 71B provides an important link from the ARTP to the central business district and to Drake Field, Fayetteville's general aviation airport.

#### Interstate 540

Interstate 540 provides connections to I-40 to the South and improved access to I-44 to the North. I-540 has significantly reduced travel times from the Northwest Arkansas region to the rest of Arkansas and beyond. In addition, I-540 provides convenient access to the Northwest Arkansas Regional Airport (XNA).

While traffic counts along S School Avenue have declined, traffic along Razorback Road has increased 254% since its extension and connection with I-540 was completed.



Northwest Arkansas Regional Airport Terminal (XNA)



Cato Springs Road exit from I-540



City Parks





Entry signs for Fayetteville S School Avenue







## GATEWAY AT RAZORBACK ROAD





Baum Stadium at George Cole Field



Entry signs for Fayetteville and ENRC on Razorback Road



Genesis Technology Incubator at Engineering Research Center

## UACDC

University of Arkansas Growth Recent University of Arkansas growth has been primarily focused to the south along Razorback Road. Razorback Road is relatively undeveloped from 6th Street to the Bypass. The University recently completed Baum Stadium and the Randal Tyson Track Facility at the corner of Razorback Road and 15th Street. The Road Hog RV Park catering to sports fans, opened last year at this intersection as well.

The Engineering Research Center (ENRC) site is a logical location for the proposed Arkansas Research and Technology Park. Its proximity to Razorback Road is important, as this has been identified as a primary entry into the city. Future development is likely to occur along this route, and design guidelines can be used to insure that future growth will be aesthetically pleasing and maintain a positive image for the city and the park.

Cato Springs Road and S School Avenue have been developed with a range of residential and commercial business of varying appeal and quality. These streets need to be enhanced with sidewalks and landscaping to make them more attractive and inviting to passersby.

City of Fayetteville Property

University of Arkansas Property

City Parks

## MAJOR ROADS

The ENRC is located on Research Boulevard, which serves as the main entry for the existing site. This entry creates a connection to South School, which leads to the heart of Fayetteville's central business district. The ENRC's secondary entry is located south of the site and connects to Cato Springs Road, which also serves as the current link between S School Avenue and Razorback Road.

I-540's Exit 61 is the Cato Springs/Razorback Road exit, and the main road leading to the University of Arkansas from the south. Razorback Road also intersects with main east/west connectors, such as 6th Street and 15th Street (which leads to the Fayetteville Industrial Park). Land use along both 15th Street and S School Avenue is mainly commercial, with residential property behind.



Razorback Road looking towards campus

S School Avenue, with downtown Fayetteville in the distance



15th Street, view east to the intersection at Razorback Road



Cato Springs Road from Razorback Road



Entry into Research Boulevard from S School Avenue







## UACDC

## **VEHICULAR ACCESS**

Traffic Count for ARTP Area

The completion of I-540 affected South Fayetteville in many ways. Not only did the interstate create a new entry for the city of Fayetteville, it reduced the number of vehicles using US Hwy 71B also (S School Avenue). University and City growth began southward with the renovation of the Department of Motor Vehicles office, the construction of Baum Stadium at George Cole Field (Razorback baseball), the Randal Tyson Track Center, Road Hog RV and tailgating park, and the expansion of Swanson Foods. The increase in connectivity and development has resulted in more traffic on Razorback Road and decreased traffic along S School Avenue.

As noted on the drawing (left), 1997 figures indicate cars per day before I-540, and 2000 figures reflect cars per day since the interstate was completed. Source for data: City of Fayetteville Traffic Control and Parking Office.

Principle Arterial Minor Arterial Collector Proposed Minor Arterial

9 Context

## SIGNIFICANT PROPERTIES

The proposed site for the Arkansas Research and Technology Park (ARTP) incorporates the University of Arkansas Engineering Research Center (ENRC). The area is bordered on the north by Town Creek Branch, to the west by a mixture of residential and industrial development, to the east by S School Avenue and to the south by Cato Springs Road. An abandoned railroad easement, owned by the city, runs east to west through the proposed site. To the northwest of the site is Greathouse Park, which could serve as an amenity for ARTP.

The City of Fayetteville owns a large parcel of land east of S School Street. This parcel, located between ARTP and Fayetteville's industrial park, could serve as the park's link to advanced manufacturing and heavy industry. Although hilly and heavily wooded, approximately 18 of this 32 acre site is developable for assembly/manufacturing and could be phased into the overall ARTP plan.

The current link between the proposed site and Razorback Road is along Cato Springs Road. While most of the development along this two-lane road is low density residential, there are several large parcels in this area. These include sites such as the City of Fayetteville's Public Works Department, located at the intersection of Cato Springs and Razorback Road; Mid-Continent Concrete, located on the active railroad line; and Garland Square Apartments near the historic Fayette Junction area.





## SIGNIFICANT PROPERTIES



**1** Baum Stadium Ticket Area at George Cole Field



**2** *Greathouse Park* 



**3** Genesis (ENRC)



**4** *Mid-Continent Concrete* 



**5** Residential Area



6 Drake Field



7 City of Fayetteville Public Works



**8** 32-Acre City property



9 Garland Square Apartments on Cato Springs Road

## UACDC

Properties in the ARTP Vicinity The surrounding neighborhoods, as can be seen in the accompanying photographs, are modest in nature, consisting primarily of single story homes, warehouses, some industrial uses, and low scale commercial development. Greathouse Park, which encompasses 6.5 acres of open parkland, represents an important asset for ARTP as well as the community at large. The University of Arkansas has been expanding its development to the south, suggesting that in the future, the proposed ARTP will have a stronger connection to both downtown Fayetteville and UA. Drake Field, formerly the local airport serving Fayetteville and now replaced by XNA, can provide convenient access for visitors and tenants. New land acquisitions in support of ARTP should be directed not only to enhancing functional relationships, but also address the issue of appearance of the project from surrounding highways and neighborhoods.

11 Context

## **EXISTING SITE PROPERTIES**

## **ARTP Site**

Property owned by the City or UA totals 35 acres. Land unencumbered by floodplain includes 24 acres. Additional land unencumbered by floodway totals 9 acres. Of the 24 acres, the majority is either taken up by the existing facility or in situations not readily developable as part of a contiguous development.

## ARTP Assembly Complex Site

The City owns 32 acres of land, none of which is encumbered by floodplain. As the site climbs the north side of South Mountain, 14 acres become too steep for conventional assembly/manufacturing development. The hillside could accommodate smaller buildings such as a corporate retreat center and cabins.







# EXISTING SITE PROPERTIES



Fayetteville Public Works, south of Cato Springs Road



Abandoned railroad easement behind ENRC



Recently traded parcels along S School Avenue



32-acre city property along 19th Street



32-acre city property along S School Avenue

View of ENRC and Genesis, looking north from Cato Springs Road

UACDC

#### **ENRC** Parcel

The existing Engineering Research site consists of one 28 acre parcel with approximately 180,000 sf of University buildings situated on its northern edge. To promote the high quality environment envisioned for the ARTP, the existing ENRC will require renovation. Part of our recommendation is to screen the loading docks currently located in an interior courtyard, either by landscaping, building a wall, or relocating the docks to the west side of the building.

#### Additional University Parcels

The University has acquired approximately seven acres of property split into a number of smaller parcels. While these parcels are adjacent to the primary parcel, they do not create a contiguous developable site.

#### Abandoned Railroad Grade

The City owns a 150 ft. abandoned railroad grade which traverses the site area immediately to the rear of the existing ENRC building. This property extends from S School Avenue to Garland Avenue.

#### 32 Acre Parcel East of School Avenue

This parcel runs adjacent to 19th Street and borders S School Avenue. The property climbs the north side of South Mountain toward the Fayetteville Country Club.

#### Other City Property

The City also owns a 5 acre parcel directly west of ENRC which is mostly in the floodplain but contains two potentially interesting water features in the form of severed stream meanders. There is also a 6.5 acre city park just northwest of ENRC.

## PROPOSED SITE BOUNDARY

#### Proposed ARTP Site

The proposed site would total 77.4 acres of UA and City property. This includes 40.9 acres free of floodplain. There are 23.3 acres within the 100/500 year floodplain which can be used for parking, roads, and green space. An additional 13.2 acres fall within the floodway, and should not be developed with the exception of recreational facilities.

#### Proposed ARTP Assembly Complex Site

City would own 45 acres, approximately 15 of which would present development constraints due to existing slope conditions.







## PROPOSED LAND ACQUISITIONS



Parcels north of railroad grade to the west



Parcels immediately north of railroad grade to the east



Parcel east of Genesis parking lot



Parcels along west side of S School Avenue



Parcels along east side of S School Avenue, north of 22nd



Parcels east of S School Avenue along Nonamaker Drive



#### Parcels North of ENRC and Railroad Bed

This land falls predominately within the floodplain, but also contains several key flood-free acres just north of railroad grade. The parcel also includes many potential amenities such as trail possibilities and park areas. This parcel would also physically connect the ARTP with Town Creek Branch, Greathouse Park and surrounding residential neighborhoods.

#### Other Parcels Contiguous to ENRC

Parcels east of ENRC consist of land along S School Avenue and Cato Springs Road. These parcels would create contiguous help to development and create an improved appearance of the proposed ARTP.

#### Parcels East of School Avenue

These parcels run along S School Avenue and north of 22nd Street. This property would facilitate a much stronger connection between the existing City property and ARTP proper. The parcels would also create a development corridor for the ARTP and provide much needed frontage along S School Avenue. The land is predominantly developable due to its soil, topography, location to the floodplain and other natural features.

# **Inventory** Site Analysis





UNIVERSITY OF ARKANSAS COMMUNITY DESIGN CENTER

## SLOPE ANALYSIS

## **Development Guidelines**

The ARTP site area (indigo border, left side) is basically flat with some areas which will require careful consideration of drainage issues. There are small areas with slopes in excess of 8%, but these are associated with creek banks within the floodways.

The ARTP Assembly Complex site (Indigo border, right side) has two distinct areas. The northern edge is in a valley, which is reasonably flat. Moving southward, the slope increases substantially.

Slopes from 0 - 1%

These areas are prone to soggy soils. Careful site planning is needed to ensure positive drainage.

#### Slopes from 1 - 5%

These soils are suitable to most types of development, so long as positive drainage is maintained.

#### Slopes from 5 - 8%

These areas are gently sloping and approach the maximum grade for accessibility issues.

#### Slopes from 8 - 20%

These areas are developable but exceed accessibility grades. Measures would need to be taken in public spaces to conform to regulations.

#### Slopes in excess of 20%

These areas are developable only with significant engineering.



**ARTP Arkansas Research and Technology Park** Fayetteville, Arkansas March 1, 2002

## UACDC



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## TOPOGRAPHY

## The Seven Hills

Fayetteville was built on and among seven hills located in the Ozark Mountains. The downtown and university are located on high points, and the ARTP site is located in a valley along Town Creek Branch as it flows to the White River. The lowest elevations are naturally associated with these drainage ways. The highest elevation in the area is just east of S School Avenue around the Fayetteville Country Club, uphill from the City of Fayetteville property.

	Eleva	atior	n in Feet
115	50 - 1175		1450 - 1475
117	75 - 1200		1475 - 1500
120	00 - 1225		1500 - 1525
122	25 - 1250		1525 - 1550
125	50 - 1275		1550 - 1575
127	75 - 1300		1575 - 1600
130	00 - 1325		1600 - 1625
132	25 - 1350		1625 - 1650
135	50 - 1375		1650 - 1675
137	75 - 1400		1675 - 1700
14(	00 - 1425		1700 - 1725
142	25 - 1450		

## HYDROLOGY

## Drainage and Floodplains

Surface drainage in the study area is concentrated in Cato Springs Branch and Town Creek Branch which flow east into the West Fork of the White River. Tributaries of Town Creek are primarily intermittent drainage ways with some associated erosion.

The floodplain with in the proposed site area represents a factor that needs to be taken into consideration in site planning.

While drastic floods are often described as events which could not have been anticipated, patterns of human intervention lead to inevitable "natural" disasters. The focus of attention during floods is the place where the water damage occurs, not where the problem was generated – most often in small tributaries upstream. Storm water practices upstream can have devastating effects on downstream neighbors and taxpayers.

Careful assessment of a site points to whether a stream's channel, width, depth and meander are in balance with its valley slope, channel bed and discharge. Proposals in this report address these factors through focusing attention on the streambeds. In the final design process, special consideration to site drainage through proper stream development will result in a positive site amenity.

Data represented here is derived from F.E.M.A. maps and information provided by the City of Fayetteville GIS department.

Floodway – No Construction Recommended

100 Yr. Floodplain

500 Yr. Floodplain







A typical healthy stream has a floodplain well defined by stream terraces, which contain flood waters.

## Drainage and Floodplains

Knowledge of healthy urban stream characteristics is essential for ARTP architects, engineers and developers. increasing the gradient. Meanders reduce sediment load, increase infiltration potential and reduce velocity. Conventional storm water practices, such as channelizing, rip-rapping and straightening streams are det-Use Energy Dissipating Features rimental to the intent of this project. These practices Where straight channels cannot be avoided, energy cause water to move faster than ever, increasing erosion should be dissipated with waterfalls and other energy and lessening the infiltration potential, which leads to dissipating devices. increased volume, velocity, and sediment loads downstream. Ideally, water quality professionals, hydrolo-Maintain an Adequate Floodplain gists, engineers and design professionals work together An adequate cross-sectional profile must be maintained to mitigate the impacts of development in a project such in order to accommodate inevitable flooding. Areas as ARTP. developed within the floodplain should maximize permeable surfacing and mitigate runoff pollutants.

A typical healthy stream has a floodplain well defined by stream terraces. Some important goals to keep in mind follow.



Typical development strategies illustrated above eliminate terraces, and reduce cross sectional capacity. When flooding occurs, water more readily jumps the banks of the channel, and flooding covers a much larger area.

The existing stream profile along Cato Springs Branch has an eroded channel with a very shallow floodplain. Deepening terraces within the floodway and maintaining cross sectional volume are two recommended strategies.

## UACDC

## **HYDROLOGY**

#### Maintain Sinuosity

When a stream is straightened, it is also shortened,

## SOIL ANALYSIS

#### **Development Analysis**

This analysis is based on the U.S.D.A. soil survey for Washington County. Descriptions are given only for soil types found within the master plan area. Soils in the site area are characterized by flat terrain and slow permeability. Wet soils are listed as a hazard in many areas. While several conditions are less than ideal, they are manageable through proper design and engineering.

Soil limitations listed in the matrix on the facing page are rated as slight, moderate or severe. Slight means soil properties are generally favorable for the indicated use, or limitations are minor and easily mitigated. A moderate limitation indicates that some soil properties are unfavorable, but the limitations can be overcome or modified by special planning and design. Severe limitations indicate soil properties difficult to mitigate, in these areas major soil reclamation, special design, or intensive maintenance would be required. These recommendations assume moderate duty roadways and buildings of no more than three stories.

## Master Plan Area Soil Types





	Jo	Le	JaB	Sn	SfC2 Sayannah	ТоА	EnC2	ErE
	Johnsburg Silt Loam	Leaf Silt Loam	Jay Silt Loam	Sloan Silt Loam	Fine Sandy Loam	Taloka Sandy Loam	Enders Gravelly Loam	Enders Complex
Typical Slopes/	0 - 2%	0 - 1%	1 - 8%	0 - 3%	3 - 8%	0 - 3%	3 - 8%	8 - 20%
Location	Stream terraces, broad uplands	Level or depressional areas	Broad uplands	Stream areas	Benches, Stream terraces	Broad uplands	Mountain Benches	Mountainsides
Denth to Bedrock/	5 - 12'	$4 \frac{1}{2} - 8^{2}$	5 - 7'	5 - 7'	> 5'	5 - 10'	3 1/2 - 8'	3 1/2 - 8'
Type of Stone	Sandstone/Cherty limestone	Sandstone/Cherty limestone	Chert/Sandstone	Cherty limestone/ sandstone/shale	Sandstone/ Siltstone/Shale	Shale, Cherty lime- stone, siltstone	Shale	Shale
Bearing Capacity	Low	Low	Moderate	Low	Moderate	Moderate	Moderate	Moderate
Drainage and Permeability	Moderately drained, slow per- meability	Poorly drained, very slow perme- ability	Moderately drained, slow per- meability	Moderately drained	Moderately drained, slow per- meability	Moderately drained, slow per- meability	Moderately drained, slow per- meability	Moderately well drained
Erosion Hazard	Slight	Very Slight	Moderate	Slight	Severe	Slight	Very Severe	Severe
Shrink Swell Potential	Moderate	Moderate	Moderate	Low	Moderate	Moderate	Moderate	Moderate
Building Limitations	Severe: Seasonal	Verv Severe <sup>-</sup> Sea-	Slight	Severe <sup>.</sup> High flood	Slight	Moderate <sup>•</sup> Bearing	Moderate <sup>-</sup> Bear-	Severe <sup>.</sup> Bearing
(Served by Sewer)	high water table	sonal high water table		hazard, seasonal high water table	g	capacity, shrink swell pot., high water table	ing capacity, shrink swell potential	capacity, shrink swell potential
Recreational Limitations	Severe: Low traffic- ability	Severe: Low traffic- ability	Slight	Severe: low traffic- ability	Slight	Moderate: Moderate trafficability	Slight	Very Severe: low trafficability, slope
Light Industry Limitations	Severe: Low bear- ing capacity, sea- sonal high water	Severe: Seasonal high water table, bearing capacity	Slight	Severe: Flood hazard, bearing capac- ity, high water table	Slight	Moderate: Moderate bearing capacity	Severe: Bearing capacity, shrink- swell potential	Severe: bearing capacity, slope
Roadway Limitations	Severe: Low bear- ing capacity, sea- sonal high water	Severe: Seasonal high water table, bearing capacity	Slight	Severe: Flood hazard, bearing capac- ity, high water table	Slight	Severe: Low traffic supporting capacity	Severe: Low traffic supporting capacity, erodibility	Severe: Low traffic supporting capacity

## SOIL ANALYSIS

23 Inventory

## VEGETATION

## Tree Cover and Grasslands

Tree cover in the site area is sparse or episodic for the most part, interspersed by grassland. Trees are concentrated along waterways. While the quality of the canopy is not stellar, there are some nice mature tree specimens in various places. Care should be taken as development proceeds to identify desirable stands and protect them accordingly.

Common species include hackberry, ash, red oak, pine, sycamore, locust, red cedar and elm. Some species which are particularly attractive include sycamore, hackberry and osage orange.



Photo from Trees, Shrubs, and Vines of Arkans

Sycamores with their distinctive bark are found along waterways

# **15th Street** Proposed **ARTP Site Cato Springs Road** I-540 Interchange







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## CURRENT OWNERSHIP

The current land ownership map shows the City of Fayetteville and the University of Arkansas as the two major landowners in the vicinity of ARTP. The University owns the current ENRC site and some nearby parcels that have been recently acquired. The City owns the abandoned railroad easement, a recently acquired 32-acre plot east of S School Avenue, and two other parcels nearby to the west. There are three other private owners of sizable parcels, while the remainder of the proposed acquisitions are smaller parcels.

City of Fayetteville Property

University of Arkansas

City Parks

Note: All other color designations refer to privately owned parcels.

25 Inventory

## UTILITIES

#### Water and Sewer Lines

ARTP site and the adjoining assembly complex site are generally well served by adjoining principal water and sewer line, as can be seen on the accompanying plan. However, within each site a carefully designed grid of sub-surface utilities will need to be prepared, that can anticipate the location and requirements of each new building as it comes on line. In this respect, the comprehensive master plan should not only make prudent forecasts about future building sites and sizes, but also estimates projected service demands. The UA Campus has made substantial investment in steam and chilled water generation, as well as a system of underground tunnels to facilitate maintenance and upgrading of utility lines.

## Subsurface Power Lines

Development of a comprehensive master plan offers the opportunity to develop a complete underground grid of electric service, possibly utilizing efficient high voltage service with local transformers and key points where required. In addition to the obvious advantages of buried service lines, in terms of inclement weather, a project of this nature cannot afford to have a large number of unsightly power lines and pole-mounted transformers adversely affect the overall appearance of the project. Experience has demonstrated that burying power lines at the outset of the project will be much economical than if left for later installation.

Data depicted here is from City of Fayetteville engineering department.

- Sewer Lines
- Water Lines



**ARTP** Arkansas Research and Technology Park Fayetteville, Arkansas March 1, 2002



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## UTILITIES

## **Bury All Power Lines**

## **CURRENT ZONING**

South Fayetteville has a contiguous band of industrial zoning from Highway 16 to I-540. The district contains industries such as Tyson Foods, McBride Distributing Company, Swanson Corporation, Hanna's Potpourri, and the ENRC.

South School Avenue is lined with thoroughfare commercial which extends north along College Avenue and south to the Fayetteville city limits. The ARTP site area is surrounded by residential of varying densities. The area also contains two city parks: Walker Park on 15th Street and Greathouse Park near an abandoned Levi Strauss plant.

## Zoning Districts







#### A-1 Agricultural

The regulations of the Agricultural District are designed to protect agricultural land until an orderly transition to urban development has been accomplished: prevent wasteful scattering of development in rural areas; obtain economy of public funds in the providing of public improvements and services of orderly growth; conserve tax base; prevent unsightly development, increase scenic attractiveness; and conserve open space. The permitted uses include: City – Wide uses by right, Public protection and utility facilities, Agriculture, Animal Husbandry, Single-family and two-family dwellings.

#### R-1 Low Density Residential

The Low Density Residential is designed to permit and encourage the development of low density detached dwellings in suitable environments, as well as to protect existing development of these types. Permitted uses include: City – Wide uses by right and single family dwellings.

#### **R-1.5 Moderate Density Residential**

The Moderate Density Residential District is designed to permit and encourage the development of detached and attached dwellings in suitable environments, to encourage the development of areas with existing public facilities and to encourage the development of a greater variety of housing values. Permitted uses include: City - Wide uses by right, single-family, two-family, and three-family dwellings.

#### **R-2 Medium Density Residential**

The Medium Density Residential is designed to permit and encourage the developing of a variety of dwelling types in a suitable environments in a variety of densities. Permitted uses include: City – Wide uses by right, single-family dwellings, multifamily dwellings-medium density, City - Wide uses by conditional use permit, public protection and utility facilities, cultural and

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recreational facilities, mobile home parks, and professional offices.

R-3 High Density Residential

The High Density Residential District is designated to protect existing high density multifamily development and to encourage additional development of this type where it is desirable. Permitted uses include: City - Wide uses by right, single-family, two-family, multifamily-medium density, and multifamily-high density dwellings.

#### C-1 Neighborhood Commercial

The Neighborhood Commercial District is designated primarily to provide convenience goods and personal services for persons living in the surrounding residential areas. Permitted uses include: City – Wide uses by right, offices, studios and related services, eating places, neighborhood shopping, gasoline service stations and drive-in restaurants, and professional offices.

#### C-2 Thoroughfare Commercial

The Thoroughfare Commercial District is designed especially to encourage the functional grouping of these commercial enterprises catering primarily to highway travelers. Permitted uses include: City – Wide uses by right, cultural and recreational facilities, offices, studios and related services, eating places, hotel, motel and amusement facilities, neighborhood shopping goods, shopping goods, trades and services, gasoline service stations and drive-in restaurants, commercial recreation, commercial recreation large sites, outdoor advertising, adult live entertainment club or bar.

#### C-3 Central Commercial

The Central Commercial District is designed to accommodate the commercial and related uses commonly found in the central business district or regional shopping centers which provide a wide range of retail and personal services uses. Permitted uses include: City - Wide uses by right, cultural and recreational facilities, government facilities, multifamily dwellings (low and high density), offices, studios and related services, eating places, hotel, motel and amusement facilities, neighborhood shopping goods, shopping goods, gas service stations and drive-in restaurants, and commercial recreation.

#### C-4 Downtown

The Downtown District is designed to accommodate the commercial, office, governmental and related uses commonly found in the central downtown area which provide a wide range of retail, financial, professional office, and governmental office uses. Permitted uses include: City – Wide uses by right, cultural and recreational facilities, government facilities, offices, studios and related services, eating places, hotel, motel and amusement facilities, neighborhood shopping goods, shopping goods, commercial recreation, and professional offices.

I-1 Heavy Commercial and Light Industrial The Heavy Commercial District is designed primarily to accommodate certain commercial and light industrial uses which are compatible with one anther but are inappropriate in other commercial or industrial districts. The light industrial district is designed to group together a wide range of industrial uses, which do not produce objectionable environmental influences in their operation and appearance. The regulations of this district are

P-1 Institutional The Institutional District is designed to protect and facilitate use of property owned by larger public institutions and church related organizations. Permitted uses include: City - Wide uses by right and cultural and recreational facilities.

## **FAYETTEVILLE ZONING**

intended to provide a degree of compatibility between uses permitted in this district and those in nearby residential districts. Permitted uses include: City - Wide uses by right, public protection and utility facilities, cultural and recreational facilities, agriculture, offices, studios, and related services, eating places, trades and services, gas service stations and drive-in restaurants, warehousing and wholesale, manufacturing, professional offices, wholesale bulk petroleum storage facilities with underground storage tanks.

#### I-2 General Industrial

The General Industrial District is designed to provide areas for manufacturing and industrial activities which may give rise to substantial environmental nuisances, which are objectionable to residential and business use. Permitted uses include: City – Wide uses by right, public protection and utility facilities, agriculture, animal husbandry, offices, studios and related services, gas service stations and drive-in restaurants, commercial recreation large sites, warehousing and wholesale, manufacturing, heavy industrial, center for collecting recyclable materials.

Parks and Conservation

Source: City of Fayetteville Unified Development Ordinance (1998)

# Development Pattern Pattern for Future Growth





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## FUTURE DEVELOPMENT

## Pattern for Future Growth

Growth westward from ARTP will naturally extend towards the major vehicular entrance at Razorback Road and Cato Springs Road. Located here, a conference hotel would form a visible marker for the site, and could be easily accessed from the research buildings, commercial areas and the University of Arkansas. The location's proximity to the I-540 exit should be attractive to potential developers. In addition, a high quality hotel will provide a valuable amenity to park tenants while setting the tone for desirable development in the area.

A commercial zone is envisioned east of the hotel site, providing a natural transition between the high-density hotel complex and low-density residential neighborhoods. Businesses will serve hotel patrons, ARTP employees and residents. Located at the historic Fayette Junction site, amenities could include restaurants, dry cleaning, convenience store, bank and other small-scale enterprises.

The existing oxbow lakes can be enhanced to create a centerpiece for a new residential neighborhood. This interesting water feature can serve as an amenity for housing, which can serve faculty, business executives, research staff, graduate assistants, students and other personnel of the ARTP.

The City of Fayetteville's property, east of S School Avenue, is a natural extension of the ARTP site. Located between the research park and Fayetteville's industrial park, this site could house assembly/manufacturing activities.

## A New Community

The proposed ARTP is certain to attract a wide range of participants: visiting scholars, researchers in business and industry, representatives of foreign corporations and institutions, as well as faculty and students from various UA programs. In this respect, ARTP will need to encompass a full array of amenities, in terms of both support services and exterior site development. As envisioned, the fully developed complex will include a conference hotel, commercial businesses and services, a residential area, and associated green space, in addition to the ARTP itself. The conference center will contain meeting facilities, dining rooms, and recreation spaces, as well as lounge spaces for contemplation and reflection. An equally important factor in creating a vital and productive work environment is the design of the external environment. Investment in carefully designed walks, paths, plazas and landscaped areas is as important to the functioning of the ARTP as well-designed and equipped buildings.

As in the case of gateways, the symbolic nature of the project design ought not be underestimated. Since the ARTP purports to represent an effective partnership of public and private interests, the design of the complex needs to manifest this notion of integration. Landscaping and site development are often treated as afterthoughts in the design process. On a project of this nature, the success of the entire complex will depend upon the comprehensive development of both buildings and site with the objective of creating a strong sense of community both within the ARTP as well as the surrounding areas.







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## CONFERENCE HOTEL

An attractive conference hotel at the corner of Cato Springs Road and Razorback Road would cater to the needs of the city, the university and, perhaps more important, the ARTP. A conference hotel at this significant intersection would serve as the gateway to the ARTP and to the University, setting the tone of quality and amenity for the entire area. In addition, this corner is strategically situated as the first intersection from the freeway interchange – and the first with an unobstructed view of the University in the distance.

#### MeadowView Marriott Conference Center Kingsport, Tennessee

A 35,000 sf resort hotel in the foothills of the Blue Ridge Mountains, with the following amenities:

• Convention Center for 200+ exhibit booths

• 13 Meeting rooms

- 96-seat amphitheater and two ballrooms
- 195 guest rooms

• Dining room and lounge

- 18-hole championship golf course
- Tennis, mountain bikes and exercise room

## Westfields Marriott Conference Center

- Chantilly, Virginia
- 28 Meeting rooms
- 172 seat amphitheater
- Ballroom
- Outdoor pools
- Tennis, team sports, spa
- 18-hole golf course
- Exercise room
- Close proximity to City Center

## ARTP

## **NEIGHBORHOOD COMMERCIAL**

#### Local Businesses and Services

The intention of neighborhood commercial is to provide small, locallyowned retail and service establishments within walking distance of residential districts. Having neighborhood commercial near residential areas has many advantages, including access to pedestrian and public transit as an alternative source of transportation. The commercial areas would have development which responds to the neighborhood such as dry cleaners, hair cutters, movie rental stores, cafes and many more.

- Locate parking to the rear or side allowing the building and shop windows to be seen first
- Integrate many functions under one roof without being too large and out-of-scale with surrounding buildings
- Respond to the qualities and natural features of the site and neighborhood
- Use landscaping, not physical barriers to buffer between uses



Neighborhood commercial district; Dallas, Texas









South Orange; New Jersey Mixed-use development; Dallas, Texas



Neighborhood commercial; Georgetown, Washington DC


## **NEIGHBORHOOD RESIDENTIAL**

Residential Areas near the Workplace By locating quality residential near the workplace it will provide workers with an option of walking to work, omit the daily commute and allow users to feel like they are part of the community. Certain types of development would have to occur in order to meet the demands of the growth of the community. These complementary developments in the neighborhood would then fulfill a need for south Fayetteville and accommodate future growth pressure.

Constructing an attractive facility like ARTP, which will generate a large number of well paid employees, research technicians, and new businesses, it can be reasonably assumed that high quality residential development will take place. The present housing market appears to be directed exclusively towards traditional detached suburban development, which serves to exacerbate sprawl, and use open land inefficiently. The opportunity exists hereby new, clustered housing development, of first class construction and design quality, might be developed within walking distance of ARTP. Illustrated here are a number of projects, of varying density, that illustrate how good housing alternatives might be provided.





New residential; Sugarloaf, Maine



*Residential District; Washington DC* 



A new look at row houses



Roxbury Corners; Boston, Massachusetts

Capitol Hill mixed federal housing



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# **Design Guidelines** Principles for Implementation



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## **GUIDING PRINCIPLES**

### **Proposed Design Guidelines**

No project of the size and complexity as that being proposed for ARTP can be successfully carried out with-



out a set of design guidelines to ensure that the comprehensive development will be beautiful and well coordinated. Listed below are fundamental design principles and recommendations

to be incorporated in the project. Because the project is a large and important one, its physical characteristics and site planning have community wide implications.

### Creating Community

Both within the ARTP complex and in relation to adjacent properties, an overriding consideration in the project has to do with establishing a well integrated mix of support amenities, including dining facilities, recreation spaces, conference centers, meeting places, some commercial uses and outdoor spaces.

### Smart Planning

Preservation of open space and natural features, such as creeks and streams, needs to be an integral component of the project

ARTP **Arkansas Research and Technology Park** Fayetteville, Arkansas March 1, 2002

the economic and social success of ARTP. Clustering project, including during nightof buildings should be planned in order to minimize time use. walking distances between individual structures and to reduce impact on the existing natural environment.

### Gateways

Identification of ARTP with respect to the highway system and surrounding environment is an important design requirement. Located on S School

Avenue and not too distant from I-540, the ARTP development area serves as a key gateway to Fayetteville and the other cities in the Northwest Arkansas corridor. Whether implemented with landscape features or through landmark elements, such as a tower or physical gate structure, some sort of identifying element for

ARTP is highly recommended.

### Wayfinding

All large projects and institutions require a system of signs

Wherever possible, existing roads and infrastructure to and through the complex. Often signage is considered Public Art should be improved and reused. Exterior landscaping only as an afterthought. The master plan should include There are wonderful opportunities for including public and site amenities should be considered as essential to provision for good directional signage throughout the art within the complex. Whether developed as a sculp-

### Walks and Trails

A system of paths and trails should be incorporated into the site plan in order to encour-

age pedestrian movement throughout the project. The master plan should make provision for a hierarchy of paths, possibly of various durable and easily maintained materials, responding to the anticipated number of users between projected buildings. Walks and trails should be provided with resting places and benches at selected points. Handicapped access for tenants and visitors has, of course, to be incorporated into the plan.

### Seating

As part of the plan for exterior amenities, places for benches, low walls, and other types of seating should be provided to accommodate outdoor dining, and landmarks to assist visitors conversation groups and presentation.







ture garden, a landscaped trail, or artwork developed through contribution or competition, establishing predetermined places for the introduction of public art in relation to cutting

edge technological research can be a welcome contribution to ARTP.

### Outdoor Dining

A large complex of this nature will have to include dining spaces and/or a cafeteria to serve tenants, employ-

ees and visitors. It is proposed that outdoor terraces, preferably with shading devices and/or tree cover adjacent to inside dining rooms be included as a constitu ent part of the plan.



### **Outdoor Spaces**

In addition to well-designed buildings and interior spaces to support research activities, the development of outdoor spaces for meetings, strolling, and reflec-





terms of worker satisfaction and productivity. Landscaping for shaded walks, visual buffers, and canopies over parking areas are not only attractive, but are

efficient with respect to energy use. The creation of a park-like setting for ARTP can serve to attract visitors and community residents, as well as provide recreation and contemplation spaces for

the tenants and employees.

### Street Furniture

Integral to the landscaping and site planning effort, careful consideration should be given

to inclusion of a number of street furniture elements that will add immeasurably to the character and quality of the project. This would include: benches, bollards, water features, drinking fountains, flag standards, lamp-



posts, low masonry walls, rock clusters, and similar amenities.

Natural Beauty Maintaining the character and

tion is equally important in constitutes not only an ethical position with respect to are becoming increasingly scarce. A comprehensive trail conservation, but also serves a valuable function in creating a joyful and productive work environment.

### **Green Reserve**

Existing floodplain areas need to be evaluated as site Waterways and Streams



comprehensive park system, floodplain areas can provide a distinctive and unique character for the project.

### Trails and Greenways

Connected to the path and sidewalk system that is needed to connect buildings within the complex, a trail system is proposed that can take advantage of existing Introduction of garden areas, with flowers and plants that

or interesting topographical features. As Northwest Arkansas develops more intensively as the population increases, open quality of the existing landscape areas for recreation and exercise



system within ARTP would be attractive and useful not only for people working in the park, but also for the community at large.

planning assets, rather than Incorporating natural features, restrictions. With careful addi- such as streams and creeks, tion of marsh plants and aquatic into the master plan is not only tolerant trees, floodplains economical and ethical, but also can function as permanent has a number of important bengreenways in which plants and efits for the project as a whole



wildlife can prosper. Treating the complex as part of a Trails and greenways along existing waterways provide an attractive and comforting path system through the project. Surface runoff can be accommodated by existing streams and eliminate the need for expensive storm water systems.

### Gardens

natural features – whether tree cover, streams and creeks, change with the seasons, would be a wonderful addition



to the comprehensive plan. With of the vehicular circulation careful design, hardy species system. Once the project nears and low maintenance conditions completion, some type of intercould be established. Trellises nal shuttle system also might be and arbors, typical of botanical considered.

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Parking areas should be modest in size, centrally located, and clustered in areas near building entry points. Heavy tree cover to shade parking areas is highly

## **GUIDING PRINCIPLES**

gardens, for instance, might be included as well.

### Parking Field Design



recommended, in order to provide shade for automobiles, more pleasant walking conditions, and more desirable views from office windows and from the street. Stormwater runoff from parking lots should be carried out in such a way as to recharge the subsurface water level. Either permeable pavements and/or landscaped sump areas should be considered.

### **Public Transit**

Connections to downtown Fayetteville and the University of Arkansas need to be considered as an integral part of the comprehensive master plan. Transit stops throughout the complex should be provided as part



## CREATING COMMUNITY

Through a combination of private and public investment and development, ARTP can provide a range of amenities to serve tenants and visitors alike. It is important to recognize that research and technology innovations are not limited to the laboratory, but also encompass social and recreational activities. It should be a goal of the development of ARTP to create an environment which fosters interaction between the diverse types of ARTP residents and workers, providing opportunities for sharing ideas in a variety of settings. Some suggestions for engendering community on the ARTP campus follow.

### Use Buildings to Define Spaces

Create coherent exterior spaces through the careful siting of buildings, and maintain a humane architectural scale throughout the development.

### Provide Gathering Spaces

Create outdoor spaces of various sizes and characters to encourage spontaneous meetings among residents. Create a comfortable environment which fosters interaction. Provide both formal and natural open space, meeting rooms, dining opportunities, and integrated facilities.

### Emphasize Pedestrian Circulation Patterns

An emphasis on pedestrian and bicycle circulation encourages users to participate in the outdoor world on their way between buildings, to lunch, or to their nearby residence, and provides further opportunities for interaction

### Create Vitality Around the Clock

Establish a varied and active neighborhood community. Design facilities to encourage residents to stay in the area on evenings and weekends, and create attractive well built residences to enhance tenant retention. Provide meaningful exterior spaces adjacent to residential units such as parks.



Business School forecourt, University of Windsor Campus



Library Walk; San Diego, California



Bulfinch Mall, Northeastern University; Boston, MA





An entrance to Solana, near Fort Worth, Texas



Allée of oaks, Rosedown Plantation

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The Block at Orange; Orange, California

An important consideration in locating a Research and Technology Park is its public perception in relation to the surrounding civic environment. In this particular case, the development of an expanded research facility in south Fayetteville will serve to establish one of the significant entrances to the city, as well as to the University of Arkansas. ARTP needs to have a compelling public presence, representing as it does a partnership of business, scientific, governmental, and intellectual interests. Identification of ARTP from surrounding highways will require design elements developed to attract the attention of drivers traveling at speeds in excess of 35 m.p.h. As designs develop for the new complex, attention will need to be placed on creating memorable signage elements or a landmark that will help to identify the project within the broader environmental context. Gateways can be created using sculptural elements, trees and landscaping, or signage. The materials and character of gateway elements should be limited in number, and in keeping with the rest of the development in ARTP.



## GATEWAYS

### Establishing Identity

Sculptural gateways to White River Gardens; Indianapolis, Indiana

## WAYFINDING

A wayfinding system consists of directional signs and notable landmarks, establishing direction and a sense of place. Effective wayfinding is achieved using the fewest number of signs with the fewest number of words. Simple, clear language and graphics are most effective. Sign systems include elements at different scales for motorists and pedestrians. Images on the right are examples of signs designed for different purposes and settings, ranging from markers set in the sidewalk to signs that address the motorist.

Drivers need information in advance, whereas pedestrians usually stop and read signs. Pedestrian signs are needed at decision points to guide visitors to their next destination.

### Implementation

A comprehensive signage system should be integral to ARTP design guidelines. Many design firms specialize in developing sign and graphics packages that provide a consistent identity, in keeping with the landscape and building design.

A comprehensive sign system:

- Consists of a range of sizes and types including sign posts, banners, sidewalk or building inlays, monument signs, markers and landmarks
- Includes cohesive graphics and construction materials
- Provides directions to the next location
- Establishes a recognizable system of wayfinding throughout the area





### Landmarks

Providing orientation for vehicles and pedestrians, landmarks also make the environment more enjoyable. Buildings, fountains, public art, parks, and signature lighting can serve as landmarks. These objects not only provide unique experiences throughout a city, they also lend an identity to individual places. Often, local artists are involved with landmark projects as in this project constructed by stonemason Jim Millwee of West Fork, Arkansas.

### Vehicular Scale Signs

Located at major entrances to the site, these signs are intended to identify access to the park and major businesses. Scaled to the speed of the automobile, these signs should be highly visible and legible at traffic speeds up to 45 mph. A minimal number of words should be used to improve safety. These signs are often the first contact visitors have with the quality of the project and, therefore, should exemplify the design principles of the entire project.





All images from Designing and Planning Environmental Graphics, except as indicated



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Pedestrian Markers Scaled to the pedestrian or bicyclist, these mark significant places or buildings. These markers can also convey historical information or other details, providing interest for pedestrians along the way. In addition, pedestrian signs can contain much more information than vehicular signs, as pedestrians can easily pause to read the text.

## WAYFINDING

### **Directional Signs**

These signs are located at vehicular or pedestrian crossroads to orient visitors to the desired destination. At ARTP, these signs may indicate entrances to building clusters or districts, parking areas, and even off-site areas. Scaled for slow moving traffic, directional signs should be legible at 25 mph and should contain the fewest number of words necessary to convey information.



## WALKS AND SEATING

### Walks

Walks represent more than just paths to lead people from their cars to their office. They provide direct access between buildings and facilities throughout ARTP. They also provide scenic routes that connect the City Trails Plan to other natural areas. Whether the goal is contemplation in the course of the day, sharing ideas with co-workers, or exercise at lunch, these paths can provide a welcome relief from indoor environments.

Walks should be designed with interesting points along the way, with places to rest at appropriate intervals. People take direct routes whenever possible, so paths should be planned to facilitate efficient movement between activity nodes. All roads, paths, and intersections have to meet ADA guidelines for accessibility, and care should be taken to use appropriate materials and textures.

### Seating

Outdoor seating provides places for conversation, eating lunch, reading a books, or informal meetings and classes. People enjoy watching activity and actions. In this respect, placement of benches along major paths, or in clusters near key walkways is desirable.



Andover Companies Corporate Headquarters, Andover, Massachusetts; SWA Group



IBM Solana, near Fort Worth, Texas; Peter Walker and Partners



Discovery Square, Vancouver, British Columbia - Don Vaughan Ltd.





Deere and Co. Administrative Cntr., Moline, IL; Sasaki, Saarinen



Penn Valley Community College; Kansas City, Kansas

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Tanner Fountain, Harvard; Peter Walker and Partners



Japanese-American Plaza, Portland, Oregon; Murase Assoc.

Town Center Park, Costa Mesa, CA; Peter Walker and Partners

## PUBLIC ART

### A Complete Community

A project of the size and importance as ARTP offers a unique opportunity to introduce public artwork within existing and new buildings, as well as in designated places throughout the site. The nature and program of a research and technology institution reflects a spirit of innovation and inquiry. In this respect, public art represents an excellent partnership with the intentions and spirit of the proposed facility. Many communities allocate some percentage of overall construction to artwork. New York City, for example, devotes .75% of construction cost to murals, sculpture, fountains, and similar design elements, requiring artistic production. The complex is viewed as a park that will be open and available to the public. Public Art can add to the enjoyment and education of visitors to ARTP.

"The arts have been a valuable component for creating a healthy business climate."

— Philip M. Condit, Chairman and CEO, The Boeing Company

"From music and dance to painting and sculpting, the arts allow us to explore new worlds and to view life from another perspective. They also encourage individuals to sharpen their skills and abilities and to nurture their imagination and intellect."

— President George W. Bush





## **OUTDOOR DINING**

### Interaction and Relaxation

Dining areas provide a venue for interaction and relaxation that serve basic human needs during the course of the day. In order to be successful, dining areas should be centrally located and accessible from anywhere in the park.

They provide a place for conversation, entertainment and social interaction as well as a convenient place to eat. Outdoor dining allows users to get out of the office and experience the landscape as part of the overall park. This amenity relies on the seasons as well as the overall design of the facility to accommodate the sun and other natural features. Indoor dining areas should also be provided for a year-round establishment.







Dining in Washington DC



Greenacre Park; Sasaki Associates



Dining Terrace, Betty Marcus Park; Dallas, Texas







IBM; Solana, Texas

Herman Miller Inc.; Rockland, California



London Business Park; London, England



Cultural Arts Center; Fremont, California



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## OUTDOOR SPACES

### **Positive Outdoor Space**

In order to create positive outdoor space, the design should include the elements of sunlight, shade, seating, plantings, and areas for art and entertainment. These spaces should become focal points for the buildings they serve, and reinforce their reason for being.

These spaces can be used for many different functions - recreation, relaxing, framing landscaped views from within buildings, or from cars driving past. These areas can take many different forms, including plazas, courtyards, entries, and well-designed parking areas.

Outdoor spaces can become points of interest for not only the park populace, but also for the city residents.

### Benefits of Open Space

- Creates a more beautiful workplace, and contributes to a more productive work environment
- Outdoor space, including parks and trails, can be built on land that cannot be developed otherwise, such as floodways
- Enlivens areas at all times of the day and all days of the week
- Provides opportunity for fresh air and relaxation during workday breaks

## PRESERVING NATURAL BEAUTY

Land surrounding the existing ENRC is characterized by a mixture of meadow and wooded areas, which are traversed by small creeks. While the site is by no means a pristine natural habitat, it has many features which create an overall atmosphere of serenity and provide welcome relief from the surrounding city. With some care, development can be nestled into this pastoral setting while at the same time preserving many charming qualities.

As development continues to impact the site area, it will become increasingly urban, limiting opportunities for contact with nature. Some ways to ameliorate this situation follow:

### Establish Green Reserve

Preserve and enhance existing wooded areas, which are within the floodplain, creating a juxtaposition between woods and an open park-like setting for developed areas.

### **Protect Waterways**

Waterways should be developed according to good urban stream practice, and runoff should be mitigated though infiltration and stormwater systems. These systems could be designed to create landscaped site amenities.

### Make Effective Use of Open Space

Open spaces on ARTP campus should be actively designed to create positive outdoor spaces through the siting of buildings and circulation patterns. All residual spaces should also be treated as part of the fabric of open space on the site.



Meadow area north of Research Boulevard



Mature Hackberry tree north of railroad grade









Meadow area north of Railroad grade, looking toward creek

General area of proposed green reserve within ARTP site

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## **GREEN RESERVE**

Development will necessarily make allowance for the significant amount of flood plain within the site area. Rather than ignoring these areas in the overall plan, the flood plain provides the perfect opportunity to create water-based green space. These areas can be carefully developed to become one of ARTP's most distinctive features.

All three schemes presented in this report devote approximately 25 acres to parks and open space. They include enhanced natural areas, formal park areas and multi-use trails, as well as necessary storm water retention and runoff mitigation areas. These areas generally follow, but are not limited to, the flood zone and wooded areas.

The green reserve along Town Creek Branch would hopefully be extended to the west and east across S School Street as the development grows, creating a natural corridor connecting different types of development physically with trails and visually with enhanced natural areas.

These greenways will also provide corridors for wildlife along the streams, which can serve to maintain biodiversity. Air quality is also improved by maintaining substantial green space and providing non-vehicular transportation routes throughout the ARTP.

Providing a focus on natural amenities within the project will create a significant park amenity, enhance the recreation and transportation options, and maintain the health of the natural ecosystem.

Green preserve area

- --- Proposed internal trails
- City Master Trails Plan future multi-use trail

## TRAILS AND GREENWAYS

### **Benefits**

Trails are one of the best investments a city can make for the community. For relatively small amounts of money, economic returns are significant. Trails increase property values of adjacent property, generate new local business, and attract tourists – especially if the trail links important destinations.

Trails and Greenways:

- Make communities better places to live by preserving and creating open spaces
- Encourage physical fitness and healthy lifestyles
- Create new opportunities for outdoor recreation and non-motorized transportation
- Protect the environment
- Highlight culturally and historically valuable areas
- Provide plant and animal habitat and migration corridors

Trails are popular with all age groups because they offer a place for all kinds of activity including walking, biking and skating. Sixty percent of Americans are not regularly active, and walking provides the most readily accessible form of exercise.



Multiuse trails can be used by runners, walkers and bicyclists



Couple walking along planned nature trail



Stopping places along the trails provide relaxation in a more serene environment



## **ENHANCED STREAM CORRIDORS**

**Existing Waterways Make Natural Amenities** All development that abuts natural waterways should be concerned with potential damage to existing water features. In many urban settings streams are relegated to the status of ditches in which to dump stormwater and debris.

A strategy to ameliorate this situation involves illuminating the streams as significant natural assets and establishing greenways parallel to creeks. Pedestrian trails can thread between buildings and along the creeks to connect elements within ARTP. This would create a pleasant pedestrian experience, and provide inviting sites for sitting and recreation along the way.

Water provides a sense of vitality to the landscape. Even intermittent streams can be attractively landscaped to create a permanent visual attraction. Buildings sited near streams and natural areas should be oriented to take advantage of views and sounds of the natural environment.

By sensitively developing the small streams which cross ARTP site, the park will create an amenity for business residents, take advantage of existing natural features, and hopefully protect the watershed by drawing attention to the creek.



Meandering water feature at IBM Solana Business Park; near Fort Worth, Texas

Small creek enhanced with local boulders on the University of Arkansas campus

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## SHADED PARKING

### Tree Preservation and Parking

Parking areas for an institution such as ARTP cannot be provided in large undifferentiated lots typically associated with commercial shopping malls. It is recommended that, wherever possible, parking areas should be designed in small clustered areas, and shaded by a mix of existing and new trees. Since the entire project is being conceived as a community-wide amenity, that will serve local residents as well as tenants and visitors, careful landscaping treatment of parking areas is as important as are walks, plazas and trails. Given summer climate conditions in the Ozarks, shaded areas will help to keep cars and drivers comfortable.



North Hills Medical Park; Fayetteville, Arkansas

Shaded parking at IBM's Solana Business Park; near Fort Worth, Texas

Parking areas along Katy Trail; Dallas, Texas











### **Transit Systems**

A constituent part of the master plan for ARTP must be directed towards consideration of alternative transportation modes for tenants, visitors and community residents. While adequate parking for tenants and visitors will have to be provided on site, not every individual will have access to, or want to travel by car to ARTP. The University of Arkansas and the City of Fayetteville, recognizing the benefits of providing public transit between destinations throughout the region, have established a number of existing trolley and bus routes serving the population. As ARTP develops and expands over time, increased ridership from UA, downtown Fayetteville, and possibly Drake Field may make feasible a number of additional dedicated transit routes.

In addition to potential routes connecting ARTP to surrounding destinations, there may also come a time when some type of internal shuttle system may be required to service tenants and visitors within the project itself. Accommodation for one or both systems needs to be considered as the master plan develops. Transit stops,

### **ARTP Transit Service**

Considering the social and economic benefits to be for instance, need to be identified as part of the overall derived from the establishment of a good transit circulation plan. system for ARTP, a blending of support from City of Fayetteville, UA Razorback Transit, and the proposed ARTP Foundation would, in all likelihood, be given Rather than develop a new system, it is proposed that great consideration. Whether and to what extent user using the existing Dogwood Route Trolley service fees would be levied will need to be evaluated. Indiwould constitute a prudent initial step to determine vidual tenants, as well as the City and UA may find it viability – if the frequency, dependability and hours of advantageous to find the necessary funding sources to service can be increased to well serve commuters. With make such a system feasible. The Federal Transportation limited financial support from the City of Fayetteville and UA, the management of ARTP will need to evalu-Act of 1999, for instance, makes funds available under ate the cost and benefits of initiating transit systems to its T21 program for proposals that encourage reduction accommodate its users. of reliance on car utilization.

## UACDC

## **TRANSIT SYSTEM**

In any case, provision for comfortable and attractive bus shelters needs to be made in the master plan to allow future implementation.

### Phased Implementation

Needless to say, investment in an expanded transit system would have to wait until there was sufficient population density to economically support it. The recommendation being advanced is to consider starting with the Dogwood Route, adjusted to suit the time schedules and requirements of initial tenants and users. Later on, as ARTP develops and expands, there may be the basis for direct express service between UA centers of research and ARTP. There are a number of benefits associated with incorporation of public transit into the comprehensive plan. It may make better use of scarce land and development resources, reduce the number of on site parking places, and encourage individuals to avoid total reliance upon automobiles.

### **Potential Partnerships**

## TRANSIT SYSTEM

### Razorback Transit

University of Arkansas' Razorback Transit provides fixed route bus and paratransit van service to all University of Arkansas students, faculty and staff and the general public. The Razorback Transit buses have wheelchair lifts and are air conditioned.

Full transit services are provided, Monday through Friday from 7:00am to 6:00pm on class days throughout the fall and spring semesters, except on official UA holidays. Services are also provided during special events such as final exams. Razorback Paratransit is a shared ride curb-to-curb service for permanently and temporarily disabled persons, and must be scheduled in advance.

The College of Engineering currently provides limited van service to the ENRC and ARTP site. As the University extends to the south along Razorback Road, a new Razorback Transit route may be established to serve sports venues, new facilities and ARTP.











A public transit system is an essential element for a progressive city. Transit provides a convenient and safe way to travel, and creates less pollution than automobiles. It is important to link a transit system to parks and public trails. Public transportation, trails, parks, streets and public spaces should work together, and all are integral to good city planning.

The Trolley is currently the only municipal transit system in Fayetteville. Established in December of 1993, the trolley is free to community members and tourists. The main routes serve the Dickson/Downtown area, and other routes extend north to the Northwest Arkansas Mall.

The Dogwood Route was established in early 2000, and runs hourly Monday through Saturday 8:30am to 3:30pm. Though it stops at the ARTP site, the hour-long route makes taking the trolley inconvenient for many riders. In addition, the service stops running at 3:30pm which excludes most people from using the Trolley for work commutes.



A well placed transit stop – accessible to a variety of public and private amenities.

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## TRANSIT SYSTEM

### **Public Transportation**

### The Dogwood Trolley Route

## STREET STANDARDS

### Scenic Drive



Design Speed

Street Width

Drainage

Sidewalk Width

**On-Street Parking** 

Planting Strip Width

Pedestrian Cross Time



War Memorial Parkway, Little Rock, AR

Scenic drives serve as an edge between a preserved greenway and residential or commercial. The street is the street. Street trees serve as a buffer between the narrow and curved in order to slow traffic and allow users to enjoy the scenic beauty of the preserved area. the parkway. The greenway is usually on one side of the parkway while the other side offers residential and commercial

opportunities. Parking is designated along one side of vehicular movement and the pedestrian movement along

25 mph

30 secs.

Closed

One-Lane

6'

6'

30' (w/ median)





Pleasant Valley Drive, Little Rock, AR

Boulevards serve as landscaped thoroughfares through shielded from traffic by trees planted along the streetthe city. They may be four-lanes to accommodate larger edge. Parking along the edge is discouraged although it volumes of traffic at slightly faster speeds. Each set of may be allowed when traffic flow is minimal. two-lanes flows in one direction and are separated by a median. There are sidewalks on both sides of the boulevard with landscape buffers. Buildings on either side are

**Design Speed** Street Width Sidewalk Width Pedestrian Cross Time **On-Street Parking** Planting Strip Width Drainage

35 mph 59' (w/ median) 6' 30 seconds. One Lane 6' Closed



### Alley/Service



Design Speed

Sidewalk Width

**On-Street Parking** 

Planting Strip Width

Pedestrian Cross Time

Street Width

Drainage



Alley in Kentlands, MD

ings, which include both residential and commercial development. These roads accommodate several differ- commercial, parking is permitted in designated lots or ent functions such as garbage pick-up, mail and goods along the alley. delivery, and parking. They are narrow with one-way traffic at slow speeds. Parking is handled in differ-

Alley/Service Roads serve as access routes to build- ent ways, depending on the situation. For residential, parking is permitted in drives or along the alley. For

15 mph 15' N/A 6.5 secs. Two-side N/A Closed



Willow Avenue, Fayetteville, AR

Avenues

Avenues provide access to the neighborhoods and comwhich could link to the city's trail system. Houses are mercial. They accommodate slightly heavier traffic flow shielded from traffic by trees planted at the street-edge than local streets and are narrow so that traffic is slowed, located in a 6' planting strip. increasing safety for pedestrians. Parking is encouraged and designated along the edge of the street. There are sidewalks on both sides of the street and a bike lane,

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## STREET STANDARDS

**Design Speed** Street Width Sidewalk Width Pedestrian Cross Time **On-Street Parking** Planting Strip Width Drainage

20-25 mph 30' 6' 8.5 secs. One-side 6' Closed



## **Proposals** Alternatives for Site Configuration





UNIVERSITY OF ARKANSAS COMMUNITY DESIGN CENTER

## **PROPOSAL A: URBAN**

### Concepts & Attributes

- Commercial businesses are located along S School Avenue in keeping with the existing fabric
- Buildings oriented to streets with parking behind
- Dedicated greenspace along north/south internal boulevard
- Parking areas have density of 1 car per 350 sf of lot
- Additions to Engineering Research Center (ENRC) connect the High Density Electronics Center (HiDEC) and form internal court
- Service access to ENRC moved to west side of building
- Proposed buildings have similar size and configuration for ease in leasing
- Central ring road encloses the existing ENRC building
- Scenic drive provided along park
- Uses existing railroad easement for eastern portion of new road
- South entries to site align with existing streets along Cato Springs

### **Proposal Statistics**

\* Note: Square footage of development can be adjusted by adding or reducing the number of stories per building.

New Buildings	843,490 sf *	
ENRC	173,566 sf	
HiDEC	7,500 sf	
Total Build-out	1,024,556 sf	
Provided Parking	1,261 spaces	
Parks and Greenspace	27.5 Acres	
See appendix page 85 for detailed information		







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Proposals 60

## PROPOSALA: URBAN

### Aerial Perspective Looking Northwest

61 Proposals

## **PROPOSAL B: CAMPUS**

### Concepts & Attributes

- Site separated from adjacent properties by tree buffer
- Restaurant centrally located to facilitate social gathering and exchange of ideas
- Buildings face on landscaped parking and park/greenspace to maximize pleasant views
- All parking areas have densities of 1 car to 450 sf of lot, allowing for generous landscaping and shade trees
- Existing High Density Electronics Center (HiDEC) building given face lift and focus, highlighted by new plaza and landscaping
- Service access to Engineering Research Center (ENRC) rerouted
- Some variety in building sizes and footprints to allow tenant diversity
- Two east/west vehicular routes provided to connect ARTP with projected future research student and staff housing, retail and commercial areas
- Uses existing railroad easement for new road

### **Proposal Statistics**

\* Note: Square footage of development can be adjusted by adding or reducing the number of stories per building.

New Buildings	784,420 sf *	
ENRC	173,566 sf	
HiDEC	7,500 sf	
Total Build-out	965,486 sf	
Provided Parking	1386 spaces	
Parks and Greenspace	24.7 Acres	
See appendix page 86 for detailed information		







## UACDC

Proposals 62

## PROPOSAL B: CAMPUS

### Aerial Perspective Looking Northwest

## **PROPOSAL C: VIEW**

### Concepts & Attributes

- Site separated from adjacent properties by tree buffer
- Retail and restaurant space provided, opening on to HiDEC plaza for social gathering and outdoor dining
- Buildings face on landscaped parking and park/greenspace to maximize pleasant views
- All parking areas have densities of 1 car to 450 sf of lot, allowing for generous landscaping and shade trees
- Existing High Density Electronics Center (HiDEC) building given face lift and focus, highlighted by new plaza and landscaping
- Service access to Engineering Research Center (ENRC) rerouted
- Some variety in building sizes and footprints to allow tenant diversity
- Two east/west vehicular routes provided to connect ARTP with projected future research student and staff housing, retail and commercial areas
- Uses existing railroad easement for new road

### **Proposal Statistics**

\* Note: Square footage of development can be adjusted by adding or reducing the number of stories per building.

New Buildings	690,800 sf *	
ENRC	173,566 sf	
HiDEC	7,500 sf	
Total Build-out	871,866 sf	
Provided Parking	1095 spaces	
Parks and Greenspace	29.1 Acres	
See appendix page 87 for detailed information		







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Proposals 64

## PROPOSAL C: VIEW

### Aerial Perspective Looking Northwest

65 Proposals

## PROPOSAL D: ARTP ASSEMBLY COMPLEX AND RETREAT FACILITY

### Concepts & Attributes

- Site separated from adjacent properties by tree buffer
- Research Technology Boulevard continues the east/west axis
- Water feature creates a central focal point and helps make the transition from the complex to the retreat facility
- Retreat center is situated for panoramic views of University and Downtown Fayetteville
- Buildings located in the complex correspond to the ARTP buildings

### Program

- High quality assembly and manufacturing facilities present a corporate image along S School Avenue and 19th Street
- Hillside corporate retreat facility for special events and symposia
- Private cabins for overnight guests

### **Proposal Statistics**

\* Note: Square footage of development can be adjusted by adding or reducing the number of stories per building.

Assembly Manufacturing	201,000 sf *	
Corporate Retreat Center	17,690 sf	
Provided Parking	325 Spaces	
Parks and Greenspace	24.4 Acres	
See appendix page 88 for detailed information		





## PROPOSAL D: ARTP ASSEMBLY COMPLEX AND RETREAT FACILITY



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Proposals 66

## **Summary** Next Steps in the Process





UNIVERSITY OF ARKANSAS COMMUNITY DESIGN CENTER

## SUMMARY

### The Case for the Research and **Technology Park**

This volume and it's companion, "Arkansas Research and Technology Park: A Strategic Analysis," prepared by

the Center for Business and Economic Research, make a convincing and compelling case for the construction of the ARTP associated with the University of Arkansas Fayetteville. The projected income streams, employment opportunity

estimates, and creation of new business opportunities underscore the need for this important facility. In terms of national and global competition for goods and services, only those entities and institutions prepared to invest in the emerging technological realities of the marketplace will remain competitive.



### Location of ARTP

The existing facilities comprising the ENRC and GENESIS programs provide core components for what can become a

rich and varied research complex, located on one of the principal gateways to Fayetteville, the University of Arkansas,

To meet the overall regional strategic goals of stimulating intelligent growth to raise average household income, Northwest Arkansas must continue to move well beyond competitive low labor costs to a higher form of competitive advantage based upon knowledge, technology, innovation and effective business organization.

Uvalde Lindsey, Northwest Arkansas Council



the City of Fayetteville, provides ample opportunity for expansion and future development of the park proper, setting the stage for additional public and private investment

and the entire Northwest

Arkansas region. Univer-

sity property, together with

adjacent land and major

tracts currently owned by

### in the area.

### Planning and Urban Design Aspects of ARTP

Key features included and illustrated in the proposed master plan alternatives are:

• Increased presence along Razorback Road and S School Avenue, and convenient access from I-540,

the principal southern gateway to the entire Northwest Arkansas corridor.

Carefully organized building clusters, offering a wide array of floor sizes, which can respond to specific

research requirements.

A strong community aspect, both within the complex, and in its relationship to surrounding property develop



ment and the resulting centers of activity.

- Clustered, well-landscaped parking fields within the property, which provide the visual characteristics lacking in most malls and business parks.
- Establishment of a well-designed, nicely landscaped, road system, including a hierarchy of streets, that will provide access to the site from several points, as well as between clustered buildings within the site.
- Use of the abandoned railway line for an internal vehicular route, connecting ARTP with supporting public

  - Connections of the ARTP site to existing and proposed

and private development.

ARTP **Arkansas Research and Technology Park** Fayetteville, Arkansas March 1, 2002





adjacent centers of residential, commercial and recreational activity.

Preservation and enhancement of existing natural features, including streams and wooded areas.



Continued development to the east of the proposed site to facilitate connections to the existing Fayetteville Industrial Park.

• Inclusion of mixed-use amenities, such as dining facilities, lounge spaces, outdoor spaces and trails, parks and plazas. The creation of a humane and serviceable environment is one of the major objectives of the project.

### Importance of Excellence in Design

Good building and site design are welcome in any project, but in a complex as the one under consideration, high quality architectural and landscaping design are

essential. Not only the activities being carried out within ARTP, but also the interior and exterior characteristics convey the underlying meaning and value of the complex to the public at



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large. The project has to be visually attractive in several respects: as a gateway to Fayetteville and the northwest corridor, as a focus for potential clients, as a center of pride for local residents, and equally important as a



complex that will be undoubtedly viewed from the air on the way to and from Northwest Arkansas Regional Airport and Drake Field.



In this respect, consideration needs to be given as to where and how to retain the services of a first class landscape architecture and site planning firm,

possibly as the lead consultant in a team of experts engaged to undertake this challenging project. Review of similar projects in other parts of the nation, whether college campuses, conference centers or business parks,

reveals the crucial importance of landscape design as an integral aspect of the complex. Beyond issues of beautification and buffering from adjacent uses, the creation of attractive and

usable outdoor amenities constitutes an important contribution to worker satisfaction and productivity.

### Recommendations

The economic and planning

documents provided here represent the culmination of

many months of previous committee work and analysis and planning. The work to date establishes the case and sets the framework for a productive process that will lead to the implementation of this important project. In addition, the early engagement of a full time director

would constitute a key factor in the success of ARTP.

The next steps in the process may include:

Arkansas and the State.

Dan Coody, Mayor

Fayetteville is in the unique position to

become the catalyst for growth in the New

Economy for Arkansas. With the State, the

as active team members, we are in the pro-

necessary for Arkansas to begin attracting

and retaining technology-based businesses.

This is essential for the positive, long-term

economic outlook for Fayetteville, Northwest

City, the University of Arkansas, and Genesis

cess of building the technology infrastructure

- Establishment of a manage-
- ment structure the ARTP Foundation – to administer



 Establishment of an advisory committee, including representatives of all stakeholder groups. This would include, as a minimum, city and university representatives, local, county and possibly congres-



sional elected officials, and members of key industries with whom ARTP will be likely to collaborate.

- Establishment of architectural guidelines and site planning standards.
- Determining sources of potential funding, and establishing systems of accounting and accountability.
- Establishing a selection process and committee to obtain the services of a first-rate landscape architec-



### UACDC

# SUMMARY

tural and site planning firm. A team of experts in various fields will be required to ensure that a high quality, carefully designed, project is developed. Our recommendation would be to have the landscape architect serve as leader of a team including possibly several architectural firms, civil, structural and mechanical engineers, as well as specialists in various technologies, as needed.

Project phasing and incremental development will need to be considered at the outset of the project, and an overall infrastructure plan established and implemented.

• Finally, it has to be emphasized that all plans change in

response to emerging needs. The management team will have to periodically review and redirect plans for ARTP as it develops over time.



The entire state benefits, not just Northwest Arkansas. I think Arkansas has been sitting at a crossroads with its economic engine idling for too long. It's time to do something.

Jim Pickens, Director, Arkansas Department of Economic Development

Appendix Building Types Study Proposal Statistics





UNIVERSITY OF ARKANSAS COMMUNITY DESIGN CENTER

# ARCHITECTURAL QUALITY

### Creating an Image

A building's architecture should reflect the image of its use. Manipulation of material, form, light, landscape and mass all contribute to a distinctive image. High quality architecture is apparent in both tangible issues such as materials, and intangible subjects such as beauty.

Integral to a building is its relationship to the open and outdoor spaces around it. A sensitive and comprehensive approach to siting, landscaping, paving, illumination and transparency will greatly affect the perception of a development's quality.

ARTP will set the standard of excellence in biotechnology, transportation logistics and microelectronics. Its buildings, therefore, can be made to embody and project such principles by its innovative quality.



London's First US styled Business Park; Stanhope Properties Developers

Whitehall–Robbins Pharmaceutical Research and Design Facility; Ewing Cole Cherry Brott Philly



Chiller Plant; Leers Weinzapfel

Philips Plastic Corporation – Origen Center, Menomonie, Wisconsin; Julie Snow Architects



Solana, Texas; Ricardo Legoretta Architects



# ARCHITECTURAL QUALITY



London Business Park; London, England

Chiller Plant – University of Pennsylvania; Leers Weinzapfel Associates



Philips Plastic Corporation - Origen Center, Menomonie, Wisconsin; Julie Snow Architects



IDI / Innovations and Development, Inc.; Edgewater, New Jersey

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#### Architecture for Technology

When considering the type of architecture associated with technology sites, certain characteristics usually correspond. These characteristics include large-scale, spread-out, one-story and cost-efficient buildings. In order for technology buildings to maintain these qualities and gain recognition, the designer should take careful consideration in the location of the buildings and the way they relate to one another. More important, the exterior of the building conveys the image of the tenant. The choice of materials and form play a major role in establishing the overall character of the entire project.

The exterior should interpret the internal force by responding to the function within. In the case of high technology, the materials should reflect that image while adapting to the surrounding environment. In the case of the ARTP, the response may be to a number of issues. These may be the response to the university or the city, to the surrounding landscape, or what is located on the current site. It is up to the designers-planners to determine the needs of the users in order to create an efficient and pleasant workplace.

### Interior Quality

The quality of interior spaces is one of the most important aspects of building design, because this is where employees spend a majority of their workday. Every detail from the finishes and furniture to the spatial layout and lighting play a role in the impact on the work environment.

Spaces such as waiting rooms, public lecture halls and meeting rooms convey quality to visitors. Individual work stations and laboratories should also be of high quality to increase worker satisfaction with the physical environment, and therefore productivity.

# **R+T BUILDING TYPES**

### Multi-Tenant Office/Lab Building

- The most common building in research parks
- Buildings must flexible with different types and sizes of spaces
- 100,000' 200,000' gross sf
- 15,000' 25,000' sf average floor size
- 90'-120' average floor widths
- Laboratory use = 10 15% of floor area
- Rectangular buildings with central cores permit large tenants to be accommodated on the ends of floors with smaller tenants in the narrower central portions
- Special features may include basements, individual entries on ground level, separate controls and metering for utilities, truck loading area and wide corridors and freight elevators



### Flex Building

- Office and light industrial/warehousing space for multiple tenants
- 20,000 40,000 gross sf
- 60 120' building depth
- One story building with 21'-24' ceiling heights
- Offices with individual entrances on the front and truck docks at the rear



### Incubator Building

- Designed for start-up businesses
- 20,000' 40,000' gross sf
- One or two story configuration
- 10,000' 15,000' sf per floor
- Few laboratory spaces
- · Genesis technology incubator exists on the proposed site for the Arkansas research and technology Park and fits the above profile for size



### **Build-to-Suit Building**

- Buildings constructed by well-established companies who are looking for a large site to accommodate current and future needs
- Usually in suburban parks
- The lot size could vary from a few acres to many
- Buildings could be any size and configuration

Information gathered from <u>Research Parks: Planning and Design Issues</u> by Richard Bartholomew, a paper given at a convention of The Association of University Related Research Parks in Chicago on April 25, 2001







Source: www.dre-inc.com www.trumbull.kent.edu/new building

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### **KENT STATE UNIVERSITY**

### The New Technology Building Trumbull Campus

Warren, Ohio Domokur, Robinson & Edwards Architects

The new state-of-the-art Technology Building at Kent Trumbull was an addition and renovation of an existing gymnasium. For the first time in Kent's history, a regional campus is home to an academic department. This facility houses offices, classrooms, and laboratories for the school's various technology programs, including plastics manufacturing, robotics, environmental and laboratory technologies.

Distance learning and video conference rooms allow students at Kent's seven other campuses easier access to the technology classes. The building also includes continuing studies and a Workforce Development Center, which will continue working with area companies to upgrade the skills of current workers and better prepare future workers.

> Gross square footage: 68,000 sf

> > Start date: October 1998

Completion date: March 2000

# LOYOLA COLLEGE

The Sellinger School of Business and Management

Baltimore, Maryland Bohlin Cywinski Jackson

The Sellinger School, plus fourteen common-use classrooms, was designed into one five-level addition. The architects used floor-to-floor heights on the first two floors to accommodate large high-tech classroom spaces. The central feature is an interior atrium, connected at all levels by ornamental stairs, bridges, and balconies.

Care has been taken to optimize views to the quadrangle and to bring abundant natural light to the interiors. The building features 11 classrooms, five seminar rooms, four conference rooms, information center, Dean's office suite and 54 faculty offices.





Gross square footage: 50,000 sf

Total construction cost: \$14.4 million

Start date: June 1998

Completion date: January 2000

Source: www.archrecord.com webdev.loyola.edu



# **IOWA STATE UNIVERSITY**



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### Howe Hall Engineering and **Research Complex**

Ames, Iowa

Brooks Borg Skiles & Ellerbe Becket A transparent, modern research complex designed for adaptability, Howe Hall has flexible planning modules designed for reconfiguration to suite the needs of different departments and space utilization requirements. The walls are non-load bearing with mechanical and utility shafts bundled and spaced to create an open-floor plate, allowing freedom to easily transform small offices into large laboratories with convenient access to utilities.

The research complex houses offices, laboratories and specialized spaces for aerospace engineering, engineering mechanics, and the Iowa Center for Emerging Technologies. It also has environmental and aerodynamic wind tunnels with new research capabilities and an experimental underwater acoustics facility, the first of its kind in the state of Iowa. Located in the four story atrium is one of the main features of Howe Hall, the C-6 virtual reality lab, one of the most advanced synthetic environments in the world and the only facility of its kind in the United States.

> Gross square footage: 169,000 sf

Total construction cost: \$25.2 million

> Completion date: 2000

Source: www.archrecord.com www.iastate.edu

# **DICKINSON COLLEGE**

Tome Scientific Building

Carlisle, Pennsylvania Ellenzweig Associates, Inc.

This teaching and research building encourages interdisciplinary studies while providing a state-of-the-art facility for advanced instructional technology and interactive pedagogic approaches. The two-story building houses research laboratories, a planetarium and observatory, and academic space. Two building wings embrace a private garden space featuring an outdoor classroom.

Local limestone, the predominant campus material, is used on the two public facades facing the campus, and stucco is used on the private "garden" sides. The planetarium and observatory are housed in a dramatic metal-clad conical form, contrasting with the roughhewn stone.

Gross square footage: 48,700 sf new

Total construction cost: \$9.8 million

Completion date: 1999

Source: www.archrecord.com www.dickinson.edu www.ellenzweig.com













# MASSACHUSETTS INSTITUTE OF TECHNOLOGY



### Sloan School of Management Tang Center

Cambridge, MA Ellenzweig Associates, Inc.

The Tang Center for Management Education was designed to reflect the school's progressive programs which respond to the existing campus architecture and an evolving setting.

On all facades, generous windows produce a lively sense of transparency, revealing light and activity within, and projecting an inviting and supportive environment. All interior spaces, including an auditorium, semicircular fixed-table classrooms seating 75-130, and numerous other office and meeting rooms, contain the latest computer and audiovisual equipment.

> Gross square footage: 44,000 sf new 8,000 sf renovation

Total construction cost: \$11.4 million

> Completion date: 1998

Source: www.archrecord.com

# **ELLIS PARTNERS**

### EmeryTech/Evolve Software

Emeryville, California Kava Massih Architects

Formerly the Grove Valve Building, where huge fittings were manufactured for the shipbuilding industry, EmeryTech is now an innovative workplace for six companies. In addition to the 150,000 sf of office space, the building houses a 48,000 sf central kitchen and produce distribution with a retail area and a 612 car parking structure.

Evolve Software, developer of business applications, chose this facility for its airy grandeur: the less crowded environment supports an ease of informal interaction that has become obligatory in fast-moving, high-tech firms. The architects diffused the generous daylight with reflecting and transmitting materials to keep a sense of openness, even in enclosed areas. Eleven-foot ceilings, generous stair openings and visible meeting areas reinforce the imaginative mission of the company.

Gross square footage: 230,000 sf EmeryTech 46,000 sf Evolve Software

Total construction cost: (Unavailable) EmeryTech \$2.5 million Evolve Software

Completion date: Winter 1999 August 2000

Source: www.archrecord.com www.kavamassiharchitects.com















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# TETRA PAK, INC.

#### Tetra Pak, Inc.

Vernon Hills, Illinois Solomon Cordwell Buenz and Associates

This newly constructed U.S. headquarters for the world leader in liquid food demanded a thorough understanding of the firm's modern vision of the workplace - a teamoriented, flexible, and open floor plan that integrated multiple office disciplines from its highly dynamic business culture. Featuring exposed steel trusses, mechanical systems, and high-tech components, the building recalls the client's streamlined operation and product. Abundant use of glass in the exterior walls floods the offices with natural light and provides abundant views. Expansive glazing in tandem with soaring, 14-18 foot ceilings further enhances the sense of intimacy with the natural setting.

In addition, sensitivity to sustainable design is a strong theme, integrating economic viability and environmental integrity. This was demonstrated through novel construction techniques (placing the construction crane within the footprint of the facility and building out to preserve trees), utilization of recycled steel, acoustical ceiling tile and other building components, and recycling 75 percent of all construction debris.

> Gross square footage: 60,000 sf office area - 30,000 sf per floor 30,000 sf warehouse

> > Total construction cost: \$2.5 million

Source: www.archrecord.com www.scbdesign.com

### **RETREAT CENTERS**

### Petit Jean State Park

#### Morrilton, Arkansas

Designed and Built by Civilian Conservation Corps

Petit Jean is not only a recreational destination, but also a retreat and gathering center. Located within Arkansas' first state park, Petit Jean retreat has breathtaking vistas of the Arkansas River Valley. Also nearby are the Arkansas River, Lake Overcup, Cadron Creek, Point Remove Creek and other points of interest.

Petit Jean State Park encompasses 3,471 acres of rare natural beauty. Facilities include cabins, Mather Lodge, campsites, lake fishing, pool, hiking trails, interpretive programs, gift shop and the only state park-operated airport.

Combining Rustic-style with modern conveniences, facilities of log and stone constructed by the Civilian Conservation Corps are nestled throughout the park. Mather Lodge is a grand retreat with 24 rooms that hugs the bluff of an impressive canyon. A meal at the lodge restaurant guarantees a good view. Nearby are 32 fully-equipped cabins (20 with kitchens), and many share the same bluff as the lodge. The canyon is the work of Cedar Creek, which cascades down a spectacular 95-foot waterfall. Upstream, a rock dam on the creek forms Lake Bailey, 170 acres for fishing and pedal boating. The boathouse overlooking the lake offers a snack bar, boat rentals and fishing supplies during summer. Trails lead along forests, canyons, streams, meadows and mountainsides.

The park also offers picnic areas, playgrounds, pavilions, a recreation hall, launch ramp, pool and tennis courts. Interpreters are available to host programs and special events. Petit Jean's airport is open for daytime use only. No flight services available (tie down \$4/day – call lodge for shuttle service rates.)







Source: www.arkansasstateparks.com











Wingspread was designed and built by Frank Lloyd Wright in 1938-39 for the Herbert Fisk Johnson family. Shaped like a four-winged pinwheel, the 14,000 sf house balances grand spaces for social gatherings in the central Great Hall with smaller, more intimate spaces in the bedroom wings.

Set in a 30-acre property with a wooded ravine and a series of ponds and lagoons, Wingspread spreads across its gently rolling site, its four wings floating on stucco and sandstone courses, "Cherokee red" brick and red roofing tiles, gray cypress siding boards, and hanging masses of wild grapevine.

The Johnson family lived at Wingspread for 20 years in the last and largest of Wright's "Prairie Houses," before it was given to The Johnson Foundation. First as a private residence and then as an educational conference center, Wingspread has been an enduring masterpiece of America's most celebrated architect.

In 1936 H.F. Johnson, grandson of the founder of SC Johnson & Son, Inc., hired Wright to design a new administration building for his company. Soon after, he decided he wanted Wright to build him a home on a rural lot north of Racine, Wisconsin.

Since 1959, Wingspread's five fireplaces have been the gathering spots for conference visitors from around the world. Fireplaces symbolized for Johnson and Wright the warmth of social home life. Wingspread's other unexpected features include a rooftop "crow's nest" and a long cantilevered balcony off the bedroom wing, help to remind conferees what creative thought makes possible.

In 1989, Wingspread was designated a National Historic Landmark.

Source: www.johnsonfdn.org

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## **RETREAT CENTERS**

### Wingspread

Racine, Wisconsin Frank Lloyd Wright, Architect

### **PROPOSALA: URBAN**

		Footprint	# Flrs	Gross Area (sf)	Parking Req'd at 1	Parking at rate of	Comments
		(sf)			space/800 sf	350 sf/space	
Cluster A							
Buildings A	A1	27900	2	55800	70		
	A2	26775	2	53550	67		
	A3	26775	2	53550	67		
Subtotal Bldgs A		81450		162900	204		
D 1' A	1/0	26640	(1 1)				
Parking A	a1/2	26640	(shared)			76	
	a.3	18050				52	
Subtotal Parking A		26640				128	
Cluster B							
Buildings B	B1	22900	2	45800	57		
DunungoD	B2	28300	2	56600	71		
	B3	22500	2	45000	56		
Subtotal Bldgs B		73700		147400	184		
Parking B	b1/2	26640	(shared)			76	
	b3	31070				89	
<b>Subtotal Parking B</b>		57710				165	
<i>a</i>					4		
Cluster C							
Buildings C	C1	25000	2	50000	63	1	
	C2	25000	2	50000	63		
	C3	24650	2	49300	62		
	<u>C4</u>	24650	2	49300	62		
Subtotal Bldgs C		99300		198600	248		
Doulring C	-1/2	20040					
Parking C	c1/2	38840				111	
Subtatal Daulting C	03/4	00410				1/3	
Subtotal Farking C		99250				284	
Cluster D							
Buildings D	D1	25000	2	50000	63		
	D2	25000	2	50000	63		
	D3	25000	2	50000	63		
	D4	25000	2	50000	63		
Subtotal Bldgs D		100000		200000	250		
Parking D	d1	38915				111	
	d2	37220				106	
	d3	13975				40	
	d4	14345				41	
Overflow Lot	1	36710				105	
Subtotal Parking D		51055				403	
Cluster E							
Buildings E	E1	26775	2	53550	67		
	E2	26775	2 '	53550	67		
Subtotal Bldgs E		53550		107100	134		
Dealeine F	-1/2	(2010	(-1 1)				
Parking E	e1/2	65219	(shared)			186	
Subtotal Parking E		65219				186	

\* Building numbering indicates possible phasing

	rootprint (sf)	# Firs	Gross Area (sf)	Parking Req'd at 1 space/800 sf	Parking at rate of 350 sf/space	Comments
ENRC Additions						
Additions 1	12690	1	12690	16		
2	8310	1	8310	10		
2	6490	1	6490	10		
Subtotal ENRC	27490	1	27/00	34		
Subtotal Elvice	2/490		27490			
Parking ENRC 1p	15770				45	
2p	17680				51	
Subtotal Parking D	17680				96	
Total			Target: 785000	Required	Provided	
Buildings - New	435490		843490	1054		
ERC - Existing	173566	1	173566	217		
HiDEC - Existing	7500	1	7500	0		
Total at Build-out			1024556			
Parking	201280			1281	1261	
*425 sf/parking space allows f	or generous green	space and tr	ees within parking area	15		
Roads and Infrastructure			Square Feet	Lineal Feet	Acres	
Boulevards			Square Peel	2847	Acles	
Avenues				6120		
Service Drives				0138		
Darks and Greenspace			1107445	1/10	27.5	
		~				
			d4 d4 D3	Overflow Parking d2 d D2	Line and the second sec	

Key for Proposal A: Urban





		Footprint (sf)	# Flrs	Gross Area (sf)	Parking Req'd at 1 space/800 sf	Parking at rate of 425 sf/space*	Comments	
Cluster A								
Buildings A	A1	25,000	2	50000	63			
	A2	34,770	2	69540	87			*
	A3	40,500	2	81000	101			
Subtotal Bldgs A		100270		200540	251			
Parking A	al	106450				250		
	a2	15935				37		
Subtotal Parking A		15935				288		
Cluster B								
Buildings B	B1	24300	2	48600	61			
	B2	24250	2	48500	61			
	B3	13500	3	40500	51			
Subtotal Bldgs B		62050		137600	172			
Parking B	b1	23160				54		
	b2	50345				118		
Subtotal Parking B		73505			and the second	173		



Footprint # Flrs Gross Area (sf) Parking Re (sf) space Cluster C Buildings C C1 24750 2 49500 49500 C2 24750 Subtotal Bldgs C 49500 99000 Parking C 41325 c1 41325 c2 Subtotal Parking C 82650 Cluster D D1 45000 **Buildings** D 15000 3 D2 15000 3 45000 D3 15000 45000 D4 15000 45000 Subtotal Bldgs D 60000 180000 Parking D Subtotal Parking D 143360 d1 143360 Cluster E Buildings E E1 E2 24900 2 49800 33840 67680 2 E3 24900 49800 Subtotal Bldgs E 83640 167280 e1 e1 69200 Parking E 69200 (removed) e2 40130 127170 e3 Subtotal Parking D 167300 Target: 785000 784420 Total Buildings - New 355460 ERC - Existing 173566 173566 HiDEC - Existing 7500 7500 Total at Build-out 965486 339390 Parking \*425 sf/parking space allows for generous green space and trees within parking areas **Roads and Infrastructure** Square Feet Li Boulevards Avenues Service Drives Parks and Greenspace 1075000

\* Building numbering indicates possible phasing

Key for Proposal B: Campus

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### ROPOSAL B: CAMPUS

eq'd at 1 ce/800 sf	Parking at rate of 350 sf/space	Comments
62 :		
62		
124	1	
	97	
	97	
	194	
56		
56		
56		
205		
225		
	337	
	337	
62		
85		
62		Built when additional land acquired
209		
	1.00	
	163	
	-163	Lot replaced by Bldg E3 at build-out
	94	To be built on add'l land replaces (al)
	304	To be built on add T land, replaces (er)
	374	
Required	Provided	
981		
217		
9		
1005		
1207	1386	
neal Feet	Acros	
3500	Acies	
2100		
3100		
5100	24.7	

### **PROPOSAL C: VIEW**

		Footprint (sf)	# Flrs	Gross Area (sf)	Parking Req'd at 1 space/800 sf	Parking at rate of 425 sf/space*	Comments
Cluster A							
Buildings A	A1	25000	2	50000	63		
	A2	24750	2	49500	62		
	A3	24750	2	49500	62		
Retail A	R1	4500	1	4500	6		
	R2	4500	1	4500	6		
Subtotal Bldgs A		83500		158000	198		
Parking A	al	70800				167	
Subtotal Parking A		70800				167	
Cluster B							
Buildings B	B1	26000	2	52000	65		
	B2	35000	3	105000	131		
	B3	37000	3	111000	139		
Subtotal Bldgs B		98000		268000	335		
Parking B	b1	117000				275	
	b2	43250				102	
Subtotal Parking B		160250				377	
Cluster C							
Buildings C	C1	24300	2	48600	° 61		
	C2	24300	2	48600	61		
Subtotal Bldgs C		48600		97200	122		
Parking C	c1	51530				121	
	c2	51530				121	
Subtotal Parking C		103060				242	
Cluster D							
Buildings D	D1	25000	2	50000	63		
	D2	33800	2	67600	85		
	D3	25000	2	50000	63		Built when additional land acquired
Subtotal Bldgs D		83800		167600	210		<b>1</b>
Parking D	d1	44300				104	
i wining D	d1	44300 (4	removed)			_104	Lot replaced by Bldg F3 at build-out
	d2	44300 (1	(into veu)			-104	Lot replaced by Didg E5 at build-but
	d3	86850				204	To be built on add'l land replaces (d1)
Subtotal Parking D		131150				309	to be built on and Think, replaces (d1)

	Footprint (sf)	# Flrs	Gross Area (sf)	Parking Req'd at 1 space/800 sf	Parking at rate of 350 sf/space	Comments
Total			Target: 785000	Required	Provided	
Buildings - New	313900		690800	864		
ERC - Existing	173566	1	173566	217		
HiDEC - Existing	7500	1	7500	9		
Total at Build-out			871866			
Parking *425 sf/parking space allows for	465260 generous green	space and tr	ees within parking area	1090 15	1095	
Roads and Infrastructure			Square Feet	Lineal Feet	Acres	
Boulevards				4000		
Avenues				0		
Service Drives				2600		
Parks and Greenspace			1267450		29.1	

\* Building numbering indicates possible phasing



Key for Proposal C: View



		Footprint (sf)	# Flrs	Gross Area (sf)	Parking Req'd at 1 space/800 sf	Parking at rate of 350 sf/space	Comme
Cluster A							
Buildings A	A1	27000	1	27000	34		
	A2	42000	1	42000	53		
	A3	42000	1	42000	53		
	A4	30000	1	30000	38		
Subtotal Bldgs A		141000		141000	176		
Parking A	al	8772				25	
	a2	10363				30	
	a3	21699				62	
	a4	6000				17	
Subtotal Parking A		46834				134	
Cluster B							
Buildings B	B1	20000	1	20000	25		
	B2	20000	1	20000	25		

Subtotal Bldge B	B3	20000	1	20000	25	
Subtotal Diugs D		00000		00000	13	
Parking B	b1	8837				25
	b2	11307				32
	b3	5240				15
<b>Subtotal Parking</b>	B	25384				73



Key for Proposal D: Assembly Complex

		Footprint (sf)	# Flrs	Gross Area (sf)	Parking Req'd at 1 space/800 sf	Parking at rate of 350 sf/space	Comments
Retreat/Center							
Buildings Retreat	R1	6693	2	13386	17		
	R2	1000	2	2000	3		
Cabin	R3	384	1	384	0		
Cabin	R4	384	1	384	0		
Cabin	R5	384	1	384	0		
Cabin	R6	384	1	384	0		
Cabin	<b>R</b> 7	384	1	384	0		
abin	<b>R8</b>	384	1	384	0		
btotal Bldgs R		9997		17690	22		
arking Retreat	r1	16190				16	
and a source of the second sec	r2.	13100				40	
	r2	10100				20	
abin Drive	r3	350				1	
abin Drive	r4	350				1	
abin Drive	r5	350				1	
abin Drive	r6	350				1	
abin Drive	r7	350				1	
abin Drive	r8	350				1	
ubtotal Parking R		41490				119	
ntal					Dequired	Drowided	
uildings - New		210997		218600	272	FIOVIDED	
otal at Build-out		210797		218690	215		
arking		113708			273	325	
25 sf/parking space	allows for	r generous green	space and t	rees within parking are	as		
oads and Infrastru	icture			Square Feet	Lineal Feet	Acres	
oulevards					720		
venues					1964		
ervice Drives					3577		
arks and Greenspac	e			1062874		24.4	

Service Drives	
Parks and Greenspace	1062874

\* Building numbering indicates possible phasing

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## PROPOSAL D: ASSEMBLY COMPLEX

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### Arkansas Research and Technology Park: A Physical Planning Study

Fayetteville, Arkansas

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