

Las Colinas

A master plan for development

**Ernest J. Kump Associates
Architects**

Palo Alto, California

Introduction



The Land in Context



The Master Plan



Planning Determinants





The Las Colinas acreage consists of approximately five square miles of undeveloped land in the northwesterly portion of Dallas County, Texas.

This assemblage of valuable properties is strategically situated to take advantage of the population growth predicted for the Dallas-Ft. Worth area. It will derive powerful stimulus from the accelerated economic development anticipated in the immediate vicinity of the new Dallas-Ft. Worth regional airport. The land is owned entirely by the Las Colinas Corporation, a real estate investment and development company that owns properties primarily in Dallas County.

From the outset, Las Colinas Corporation has established excellence as the hallmark for developing the land. It seeks this quality in its development plan; it proposes to attract only the best types of development and it intends to find a means, through development controls, to assure that the highest development criteria are maintained. Initially, Las Colinas Corporation engaged Real Estate Research Corporation to analyze and evaluate the acreage and prepare a report. This report established marketing criteria

based on statistical data, and suggested corresponding potentials.

Before proceeding with actual development, the adoption of an imaginative, yet financially sound plan for development was essential. Such a plan would assimilate the findings of Real Estate Research Corporation, determine optimum land use and outline an implementation strategy. It would embody development goals for the total acreage within a 'community' concept and define the physical form and quality of that community. The plan would provide guidance for private development and local government participation.

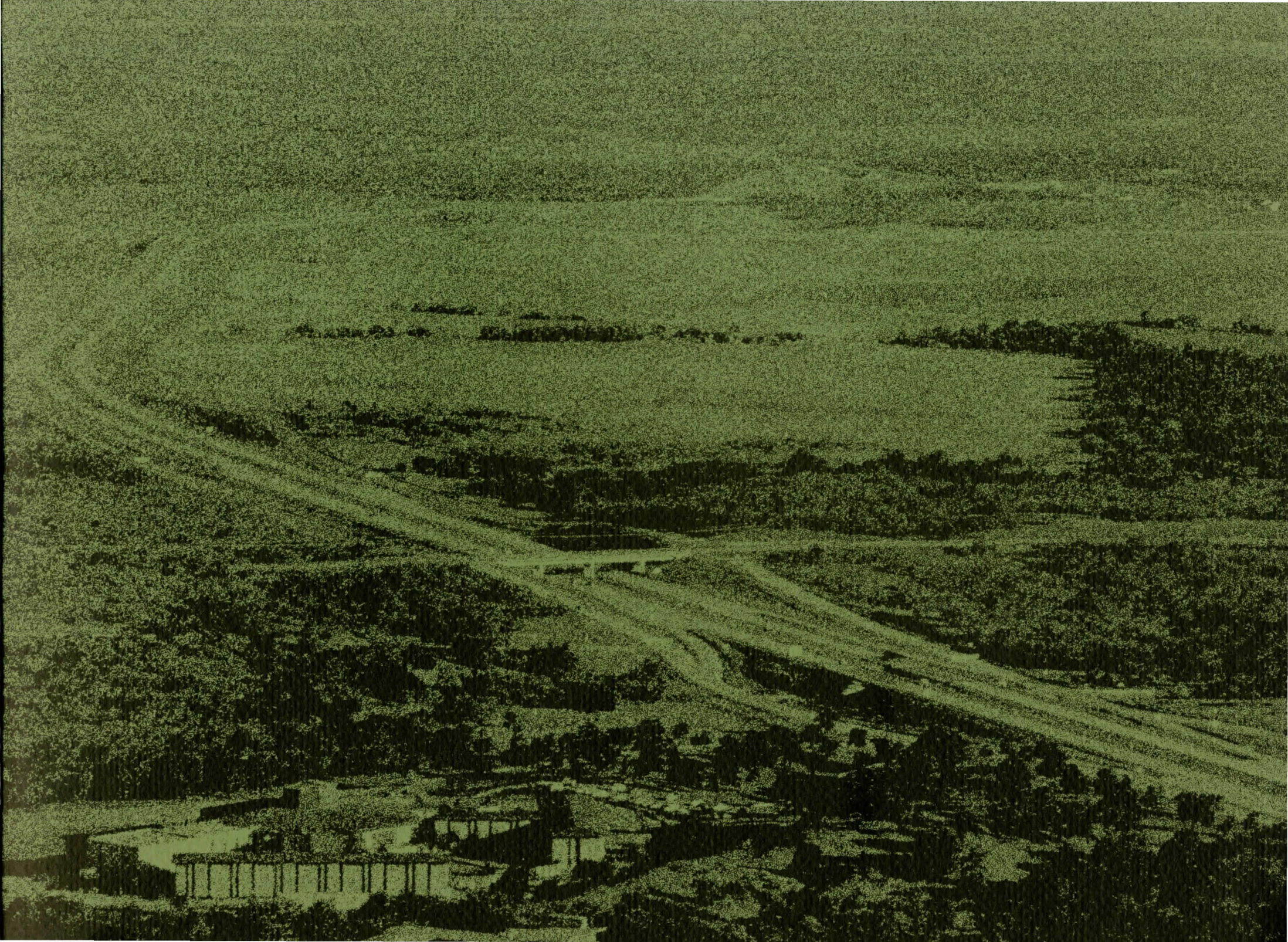
In July, 1971, the office of Ernest J. Kump Associates, Architects, was selected to prepare this plan for development. Comprehensive research was undertaken to analyze all criteria affecting conceptual decisions. Throughout the evolution of the Plan, consultation continued with Las Colinas Corporation management as well as expert counsellors in land development and related fields.

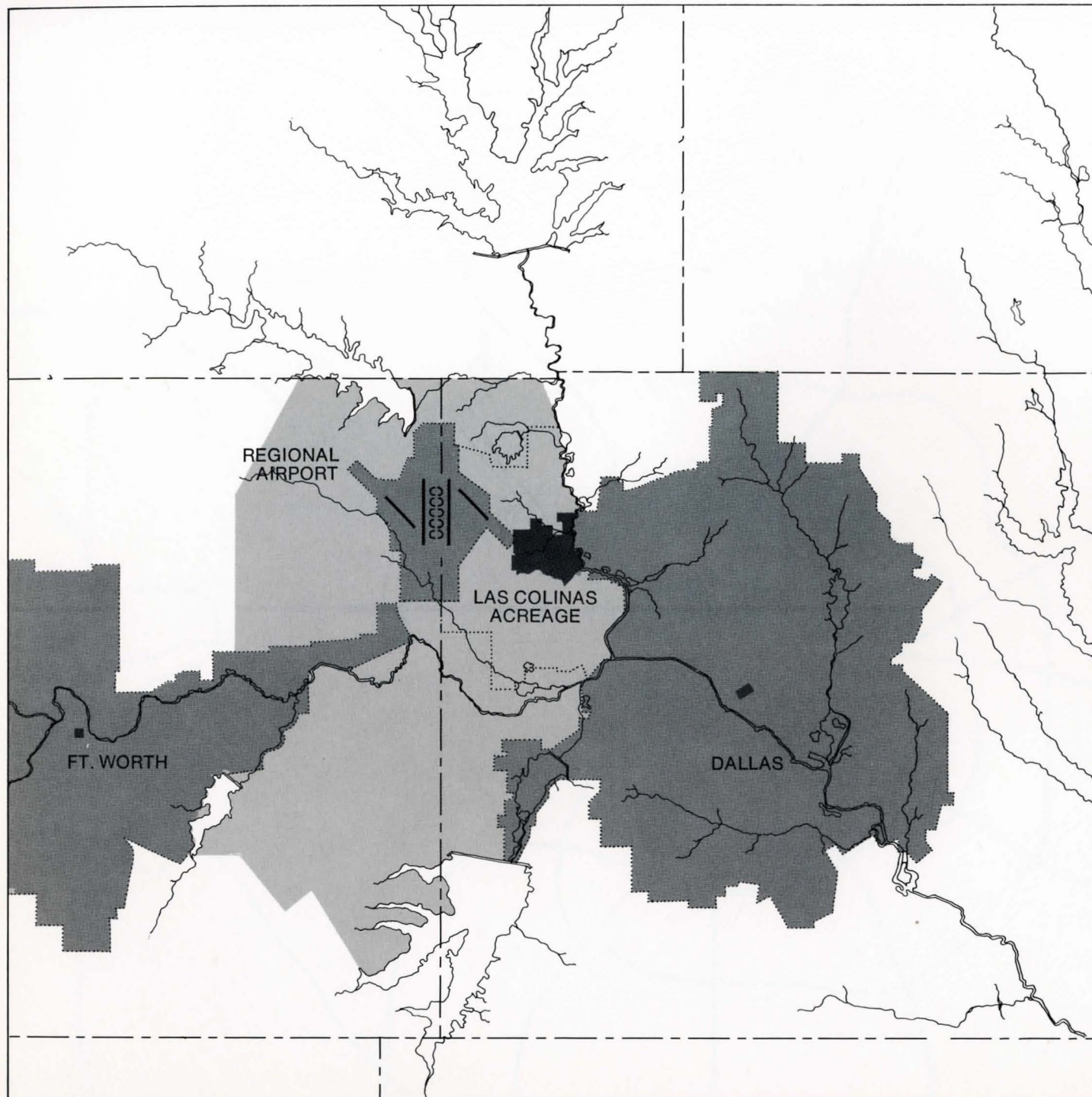
Every possible effort was made to insure a viable Plan. Visits were made to

other projects considered relevant to planning Las Colinas. Analyses were requested of special consultants to provide supporting information. As requested by Las Colinas Corporation, a panel of the Urban Land Institute was formed to provide impartial review of the planning and suggest improvements.

The master plan for development presented here is essentially a commitment to a basic concept. It provides a consistent framework for development. As the land is marketed, development plans will evolve to reflect changing needs, demands and circumstances. One such development plan is included here with the master plan. It is a working 'case study' of what may someday exist.

This commitment to a basic concept is essential if a real sense of community, identity and intrinsic overall quality is to be achieved. Through first agreeing on basic principles, a myriad of details and evolutionary options can be incorporated during actual development, while maintaining the continuity of judgment that can come only from the perspective of a total context.





The Las Colinas acreage is located approximately 10 miles northwest of downtown Dallas and 22 miles northeast of downtown Ft. Worth, in the city of Irving, Texas.

Dallas and Ft. Worth, though only 35 miles apart, have historically remained distinct economic entities. Recent surging growth, however, has merged the two urban areas. Land between them is being absorbed rapidly for uses oriented to a single metropolitan region. All major growth indices reveal the area to be one of the most dynamic metropolitan centers in the United States.

Dramatic evidence of this overall trend, and a continuing impetus to the regional economy, is development of the new Dallas-Ft. Worth Regional Airport along the Dallas-Tarrant County line. This enormous airport is scheduled for initial service in 1973 and completion by the mid-1980's. When fully operational it is expected to have 105 passenger and 25 cargo gate positions, with a projected weekday 'population' exceeding 100,000. It will be one of the nation's few 'jumbo hub' airports and the first such facility ready for the 'super' aircraft of the future.

The significance of this can be seen in that the Dallas-Ft. Worth area, already a major regional distribution center, may well become a major international port of entry for persons and goods. This potential 'air harbor' is ideally located at the approximate crossroads of the four largest population centers on the North American continent — New York, Los Angeles, Chicago and Mexico City. It forms a logical and convenient 'gateway' to the South American continent.

The mid-cities economic area, of which Las Colinas is a part, encompasses portions of both Dallas and Tarrant Counties and lies between the corporate city limits of Dallas and Ft. Worth. The several communities of this 'corridor' have remained primarily residential suburbs of the two larger cities. They are now



undergoing transition to more balanced land use and a more diversified economy. Area-wide planning is being re-evaluated continually as new demands for land use are generated and combined with existing patterns.

As now forecast, the mid-cities area will grow faster than any other portion of the Dallas-Ft. Worth area. Projections indicate that by 1985 almost one-third of the total bi-county population will live in this area alone. Total population could approach 800,000, and employment should reach a quarter million.

In 1967, the Texas State Highway Department's Regional Transportation Study recommended the essential free-way systems and expressways for the Dallas-Ft. Worth area. This comprehensive study analyzed all aspects of planning that would affect transportation requirements of the two-county metropolitan complex and its outlying areas to 1985. Based upon the study's supporting documentation, both the cities and their surrounding communities have since assimilated the information contained in the report and adapted their developmental programs to reflect its projections.

The primary regional system referred to in the report consists of the highways radiating from Dallas and Ft. Worth with loops encircling their urban centers. The heavily-travelled connections between the two cities, the Dallas-Ft. Worth Turnpike, U.S. Hwy. 80 and State Hwy. 183, have promoted development of the mid-cities 'corridor'.

Highway 183, one mile south of the Las Colinas acreage, is currently being improved to accommodate anticipated traffic to the airport's southern entrance. The proposed Interstate 635 extension, passing one mile north, is intended to provide suburbs north and east of Dallas with easier access to the northern entrance. State Loop 9 is proposed for one mile west of Las Colinas. In conjunction with State Highway 360 west of the airport, it will eventually complete a regional

north-south by-pass of the existing urbanized areas.

John W. Carpenter Freeway is integral to the state system and a vital link to the regional airport. Passing through Las Colinas, it will afford direct access from Dallas' central business district to the airport's northern entrance.

The Regional Transportation Study's traffic predictions indicate that over 50,000 cars will use this route daily by 1985. Preserving its efficiency and connection with lesser thoroughfares will become increasingly important. Already overpasses have been constructed adjacent to University Hills, and proposals for more in the northern portion of Las Colinas have been presented.

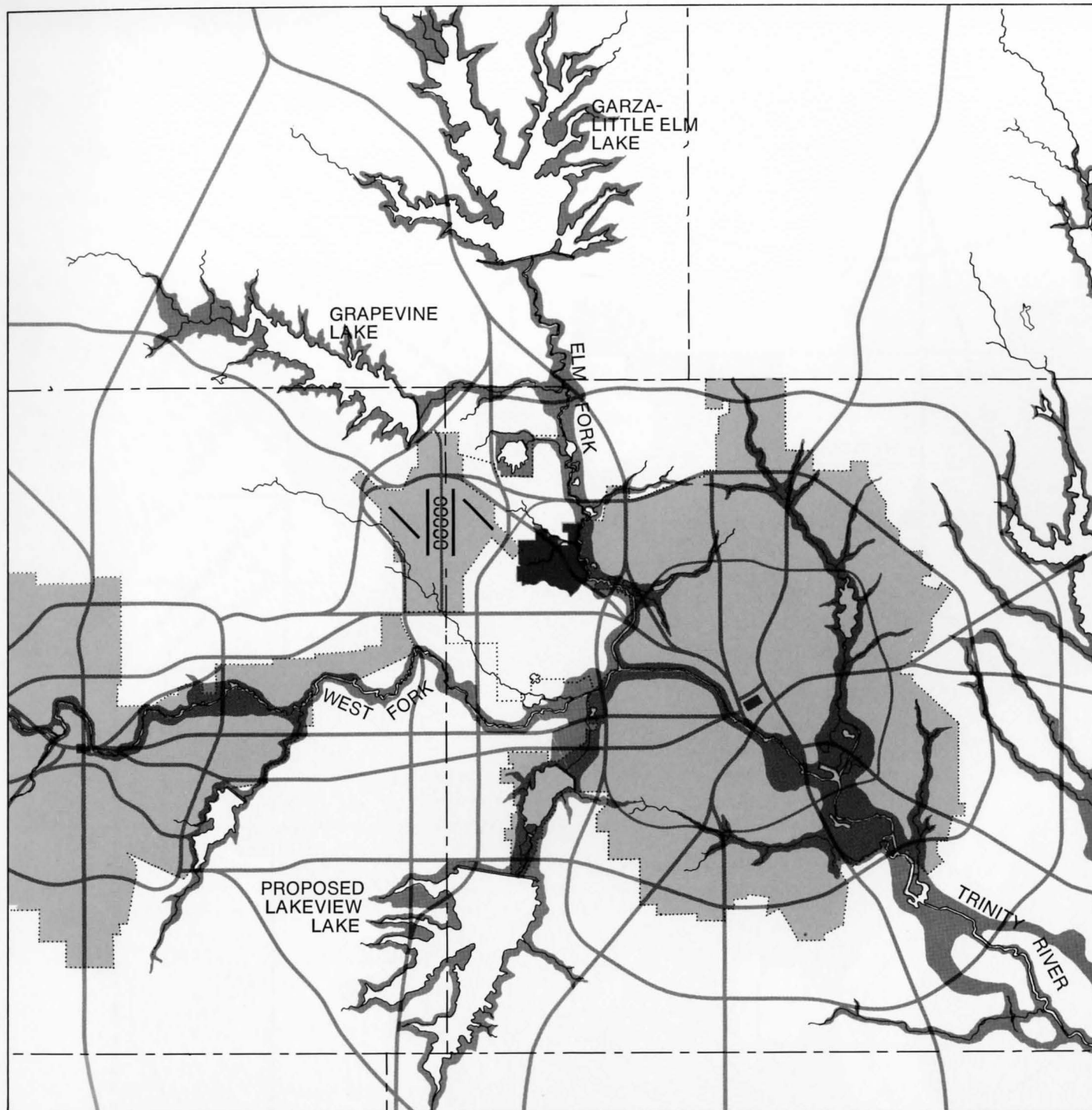
Thoroughfare plans both for Dallas County and for the city of Irving have been established to coordinate their increasing circulation requirements and access to the regional airport. The plans recommend new and improved routes through the Las Colinas acreage. Their proposed alignments, developed cooperatively by local agencies and the Las Colinas Corporation, are intended to serve the needs of the sub-regional system.

Various planning studies have analyzed rapid transit requirements for the area. All recognize the eventual need to connect the major urban areas, as well as new growth concentrations. Recently, the U.S. Department of Transportation approved a grant to design and evaluate an air-cushion vehicle system for the metropolitan area.

Creating a main transit link between Dallas and Ft. Worth becomes increasingly attractive due to regional airport development. More and more people will be seeking fast, efficient transportation to downtown areas throughout the region as passenger volume expands. Recent studies project ridership potential sufficient to warrant a detailed investigation of rapid transit in conjunction with the airport's own requirements. The airport's own

physical plan has, in fact, made an internal transit system mandatory, to provide convenient circulation between its many terminals and other parts of the complex.

When supporting population densities and other prerequisites are defined, extension of any basic system to the metropolitan region can be realized. Continuing studies are being conducted jointly by the cities of Dallas and Ft. Worth and the North Central Texas Council of Governments. Appropriate rights-of-way, subsystems to the urban areas and relationships to existing transportation routes are being analyzed for both short- and long-term effects.



The Trinity River and its many tributaries are significant features of the Dallas-Ft. Worth region. From the confluence of the Elm and West Forks just west of downtown Dallas, its main stem flows diagonally southward across Dallas County. The extensive drainage pattern has influenced regional planning and urban development greatly.

An extensive flood control system has been established to control recurrent inundation. The system creates certain lands which are set aside for periodic use as drainage channels. It is augmented by large, upstream reservoirs that check seasonal runoff and are used for recreation.

The U.S. Corps of Engineers has analyzed the area's needs. Existing floodways vary from almost virgin river conditions along the Elm Fork to the broad, leveed channel in the city of Dallas. As urbanization spreads, increasing efforts have been made to make these conditions a community asset.

The Corps of Engineers' recommendations prompted further intensive investigations, including that of the North Central Texas Council of Governments and those prepared for the Dallas County Planning Advisory Council and Dallas Park Board. Together, these studies concluded that preservation and improvement of the waterway pattern could form the basis of a regional open-space system.

The proposals call for the use of parks and stream valleys to divide the urban complex and create 'spaces' of varying size and identity. The inherent capacity of these spaces to support both active and passive pursuits on a human scale, and yet preserve the area's existing drainage pattern, is emphasized. The Elm Fork has received special attention in this regard. It is an area with outstanding recreational potential.

Realizing these coordinated proposals would establish a natural framework for recreation, flood control and water-oriented activities that will permeate the entire urban fabric of the area.



The Las Colinas acreage lies squarely in the path of the region's predicted natural growth. Market analyses and projections indicate that various land uses are feasible. By virtue of single ownership, a definite statement of overall quality and coordination of the land's many assets can be accomplished.

Las Colinas' 3100 acres represent nearly 30% of the total undeveloped land considered to have development potential in northern Irving. Though its peripheral boundaries encompass certain lands not owned by Las Colinas Corporation, these properties will become very much 'part of' Las Colinas. These ownerships include Hackberry Ranch, the Northlake Community College campus, four small separate tracts of land, and the Las Colinas Country Club.

Improvements within the acreage have been prudently restrained. Only certain areas have been cleared for agricultural use; very limited gravel-stripping operations have been allowed along the Elm Fork. With no prior necessity for extension, only minimum utilities serve the acreage. Easements for regional transmission of gas, communications and electrical power have been previously acquired by the utility companies as part of their general systems.

The single most obvious improvement in the acreage is the new State Highway 114, John W. Carpenter Freeway. Its 3.3 mile right-of-way through Las Colinas was dedicated to serve the requirements of the state highway network. It is functionally complete, with ample frontage roads and overpasses. Other roadways within the acreage are of minimum standards, except for the Leland Boulevard and a portion of O'Connor Road near the Las Colinas Country Club.

MacArthur Boulevard, now terminated at the southern boundary of the acreage, will be extended to intersect Interstate 635 and provide major traffic flow from downtown Irving to the northern limits of the city. Walnut Hill Lane is planned

to become an important arterial from North Dallas to the regional airport. It will be extended westward from Dallas, across the northern portion of Las Colinas, to an existing alignment in Irving. Spur 348, old State Highway 114, is now being upgraded to improve the overall traffic flow from central Dallas.

One of the fastest-growing suburban areas of Dallas is the City of Irving, with nearly 100,000 residents. Following improvements along the Trinity River, industrial growth and concurrent vocational attractions have provided the area with a tremendous employment base. Due to locational advantages, Irving has become the 'bedroom' community of this vast, evolving urban-suburban complex. No other community in the mid-cities area is better situated to profit from proximity to the new regional airport.

Irving is separated from neighboring communities by the natural boundaries of North Lake, the east and west forks of the Trinity River and the properties of the regional airport. Its 'downtown' area is located approximately 3 miles south of Las Colinas, on Highway 356. Other commercial developments along Highway 183 are essentially highway-oriented and heavily patronized by local residents. Portions of the acreage are now within the Irving city limits, and it is intended that the entire Las Colinas holding be annexed to the city as it lies within an area of extra-territorial jurisdiction. Irving's actual boundaries extend to North Lake, along the East Fork, with the incorporated portions of the Las Colinas acreage defining the northern edge of present city development.

Except for the Dallas Gun Club, virtually all the area north of Las Colinas is open, rural land, comprising both large and small holdings. There are no immediate plans for use of these properties, although such plans will undoubtedly arise as development pressures increase. Because of burgeoning construction at the regional airport, the present trend is

toward more speculative, as opposed to developmental, exploitation.

Immediately south of the acreage are residential sections of Irving. University Hills embraces the attractive lands of the Las Colinas Country Club; together with other parts of Irving's 'Northgate' section, they have become recognized as the area's quality residential neighborhoods.

The Northlake campus of the Dallas County Community College District will be located on a beautiful site along Cottonwood Creek; it will be completely enveloped by the Las Colinas acreage. Access to the campus will be both from MacArthur Boulevard and Walnut Hill Lane. Adjoining Las Colinas to the southeast is the University of Dallas, a 1000-acre campus with a present enrollment of one thousand.

Recreational opportunities abound both within and near the acreage. Membership in the Las Colinas Country Club provides a distinctive, 18-hole golf course and complete swimming and tennis facilities. Both public and private golf courses exist in the area. The Dallas Cowboys are close by, in the new 65,000-seat Texas Stadium. Many additional activities will be available with the proposed improvement of natural areas within Elm Fork Park.

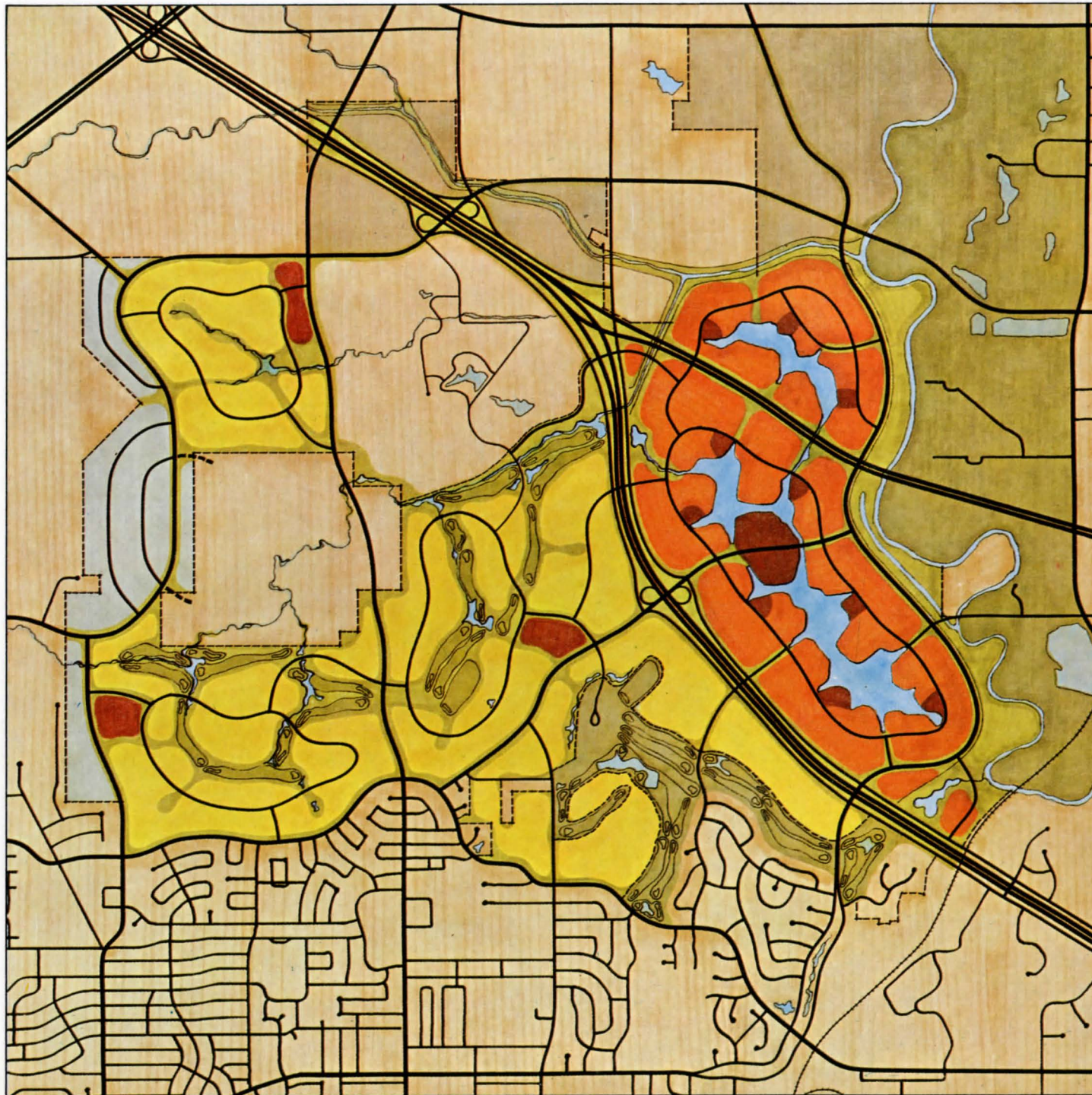
In sum, major frontage along a major freeway, ease of access, and proximity to the significant urban center developments render Las Colinas unequalled by any other existing or proposed development in the Dallas-Ft. Worth area. Real Estate Research Corporation estimates that proper planning can capture a major part of Irving's future residential demands, and Las Colinas' locational advantages give it exceptional opportunities to absorb non-residential needs as well.

While property lines define actual title to the land, the environmental boundary of the Las Colinas acreage extends outward from its entire periphery. The true expression of "Las Colinas" becomes evident only when the benefits of adja-

cent amenities are realized. Elm Fork Park, the University of Dallas, Texas Stadium, the Las Colinas Country Club and the quality residential areas partially surrounding Las Colinas all combine to create invaluable additions to the acreage itself. In a significant, functional sense, they are 'part of' Las Colinas.

Las Colinas is favorably placed to become a new center of urban activity. The adjoining regional airport extends unique advantages to the acreage. Its total impact on the greater metropolitan area is still unpredictable, though opportunities of international significance may be afforded as the airport's true status is realized. For these reasons, the acreage must preserve its innate capacity to interact and respond appropriately to the growth of its environment.





- Las Colinas will be perceived as
- an overall fabric of natural landscape, the 'land that is Las Colinas';
 - a grouping of individual communities, each with its own identity and character, but each inter-related and part of the larger community — a 'city' of villages;
 - a self-contained environment having a vital focus in its active, lake-oriented urban center, giving Las Colinas a true 'sense of place'.



The acreage is already endowed with many natural attributes. It is this environment that the plan seeks to preserve and strengthen. Its present qualities are to be enriched and extended. A simple, unifying statement of Las Colinas will be established; through it, all aspects of development and community life will coalesce.

The natural landscape of the land that is Las Colinas must be strong enough to 'read through' and absorb many individual developments, regardless of the measure of quality finally achieved in each.

Extensive open space, permeating the land, will be improved and maintained. Created lakes and streams will use to advantage the natural drainage ways. Existing flora will be supplemented to add greater interest and everchanging character. Greenways, defining recreational areas and enhancing movement patterns, will interweave the community and fuse its development with the regional open-space system.

The 'city of villages' is formed by the land's natural configuration and main traffic avenues. Each will maximize identity for its resident populations, yet effectively relate to the community as a whole by the systems of circulation and open space. Both 'urban' and 'suburban' villages give form and focus to the 'community' of Las Colinas, and serve to structure the various land-use allocations.

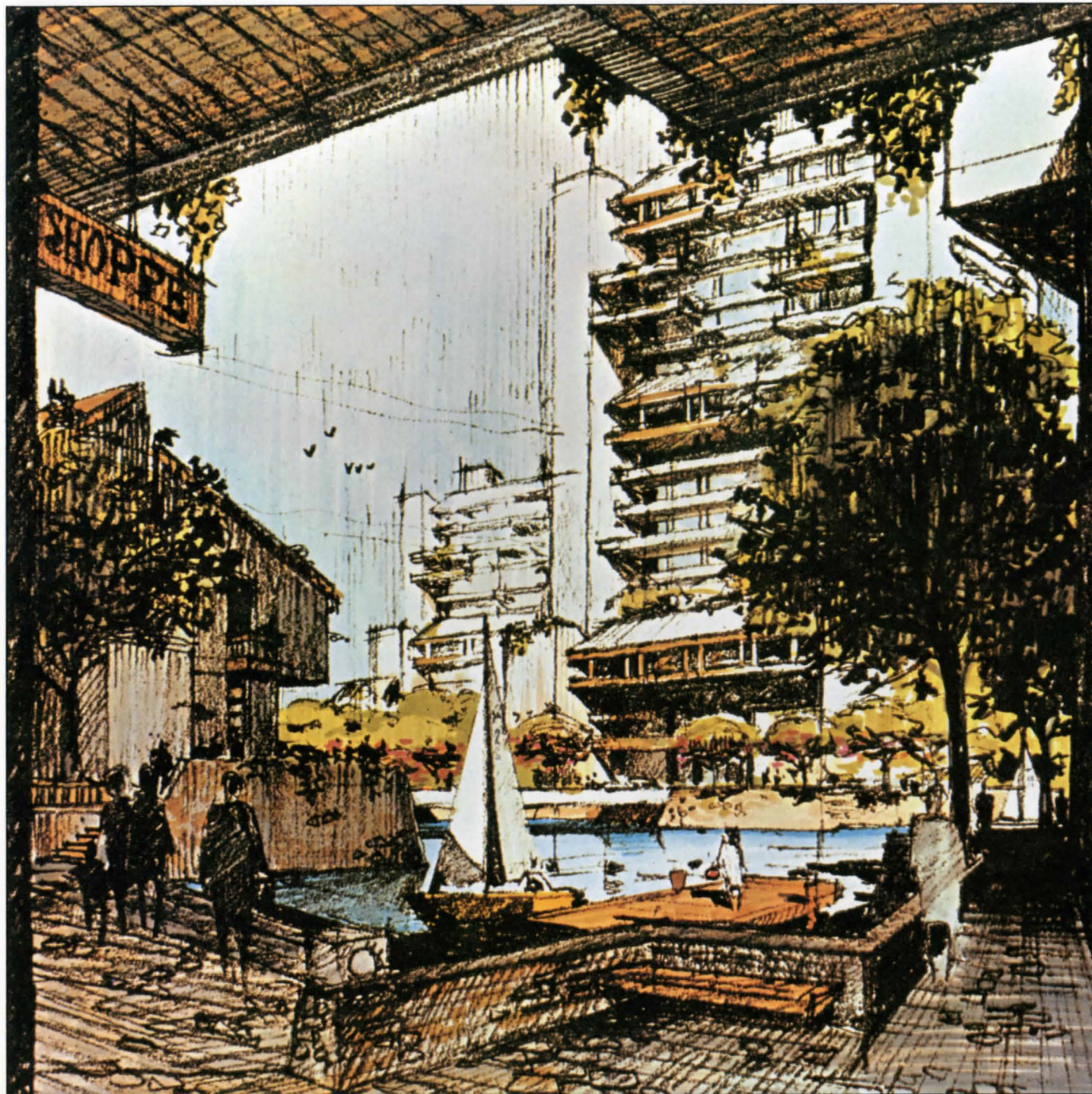
Each village will have a village square providing its focus and theme. Here will be located convenience shopping, and, in the case of the suburban villages, the necessary public and educational facilities supportable by the village residents. Their centralized locations offer easy access within the village and from external thoroughfares.



Suburban villages occupying the rolling terrain west of Carpenter Freeway will be primarily residential, though they are planned to attract, and be enhanced by, a measure of compatible, non-residential uses. Various types of housing will be clustered and situated in sympathetic relationship to the land.

Village entrances will be announced by landscaped open space and distinctive signing. Vehicular access to all development within a village will thus be limited from within the village, rather than from the thoroughfares that define it. A recurring palette of natural materials, including native stone, will be woven into all landscape construction — retaining walls, bridge abutments, headwalls, bank and stream edges. Land contouring, particularly along roadways and through parking areas, will be a major part of the landscape fabric, at times concealing traffic and buffering development areas, at other times adding interest and extending the natural, undulating character of the land. To the extent possible, roads will have 'soft' edges, will follow gently curving paths, and will be divorced from directly adjoining 'sidewalks'.

Village Entrance Character



As counterpoint, the villages east of the freeway will exhibit a marked contrast by their urban environment. Here, more compact and densely developed villages will flourish by incorporating commercial and residential developments in a distinctive setting.

Here the land will be reshaped totally by man-made improvements. Levees are required for flood protection, and internal runoff dictates the formation of large lakes. Capitalizing on these created assets, considerable water-oriented frontage, quay-side attraction, sailing and excursion boat activities are planned.

While market analyses may dictate that these urban villages be predominantly commercial, the modulation, identity and individual character of the village concept must be retained. To the greatest extent possible, a reasonable intermix of residential and commercial development should be encouraged so as to achieve the '24-hour' vitality essential to a truly urban environment.

Lakeside Character



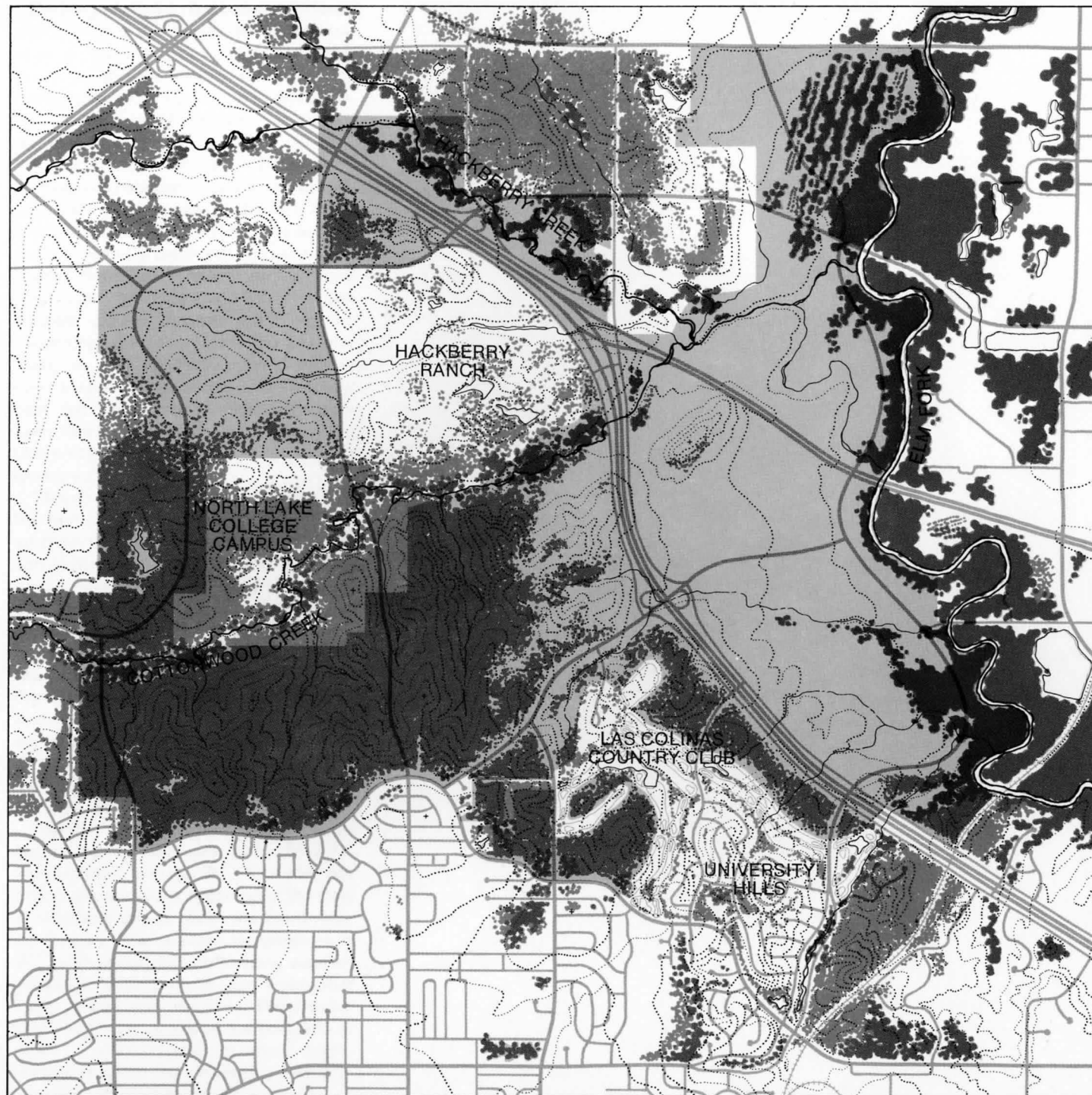
The heart of Las Colinas is the lake-side development. Its potential contribution to the greater metropolitan area, and beyond, is virtually unlimited. The new Dallas-Ft. Worth regional airport has the potential of achieving international status and may provide Las Colinas with the stimulus it needs to evolve an urban center of major consequence.

The airport's impetus may require consolidation of facilities related uniquely to an 'air world' concept, catering especially to world-wide air commerce and the exchange of ideas. As such, Las Colinas may attract not only luxury hotels and corporate offices, but also a center for international conferences and major facilities for fine arts and performing arts.

Finally, no matter how long it may take to actually achieve a fully developed urban center, the concept of this center must be sustained as a goal, giving meaningful direction and impetus to overall development.

Las Colinas can thereby fill a vacuum found in many metropolitan areas. The activity generated by a 'magnet' of this importance would imbue its community with an aura of vitality and establish its real 'raison d'être'.





The Natural Environment

Las Colinas is situated in a portion of the rolling hills of the Blackland Prairies of east central Texas, an area known more specifically as the Eagle Ford Prairie. Locally, the gradual northward rise of the land is terminated along the southern edge of the acreage. Elevations vary from 415 ft. to 550 ft. above sea level.

Las Colinas' periphery is defined by undulating terrain to the south, west and north, forming discernible gateways to the interior as one approaches from Dallas along the John W. Carpenter Freeway. Gentle ridges afford sweeping views within the acreage and occasionally the vantage point is high enough for the Dallas skyline to be seen.

The southward flow of the Elm Fork of the Trinity River has created a broad flood plain which dominates the overall land form. Subordinate drainage patterns of Cottonwood and Hackberry Creeks extend the true flood plain more than one mile into the acreage. As a result, more than half the land exhibits a slope of 10 percent or less. The remainder of the acreage exhibits widely varying slope characteristics, formed by lesser drainage patterns.

The swale of Cottonwood Creek bisects the western portion of the acreage, its definition becoming less apparent as it joins Hackberry Creek northeast of the freeway. Although backwaters of the Elm Fork, both these creeks flow intermittently and only after heavy rainfall.

Small water-storage ponds exist within Las Colinas. The largest are located on the Las Colinas Country Club lands, on Hackberry Ranch and north of Cottonwood Creek at the western boundary. Pond levels are maintained by periodic pumping from the Elm Fork, replenished from wells or normal runoff. Water is taken from the Elm Fork for use by the city of Dallas with relatively simple treatment, underscoring the fact that its quality is high.

Existing vegetation is somewhat diverse, and is related directly to the soil conditions within the acreage. The use of its cover for wildlife habitat is marginal as surrounding urbanization and other activities have greatly reduced a former abundance.

A mature tree cover of bottomland hardwoods, hackberry and cedar elm varieties follow the course of the Elm Fork. In conjunction with the park beyond, this cover effectively delineates the property's eastern boundary. Portions of the flood plain have been cleared, yet remnant riparian growth extends out from the major drainage ways. In the higher elevations, the land is partially covered with an even texture of mesquite and scattered post oak. Groupings of these trees have been thinned and used effectively within University Hills and the Las Colinas Country Club.

Though situated at the northern edge of the humid, subtropical belt that extends up from the Gulf of Mexico, Las Colinas also experiences a wide range of temperatures characterizing the continental region further north. There are no important topographic factors affecting climate in this area. Temperature averages are the result of the combined influence of cold, dry Canadian air and warm, moist air from the Gulf. Thus the climate is generally mild, the normal annual temperature being about 66.5° F. Rainfall averages 34.5 inches per year, with a mean relative humidity of 64%.

Heaviest precipitation usually occurs during April, May and June. In July, temperatures average 85°. Extreme hot temperatures usually accompany the flow of relatively dry air from the Southwest. In January, the average temperature is 46°, with snow and sub-freezing weather associated with periodic cold fronts that move rapidly into the area. These short-lived 'northers' may drop temperatures as much as 30° in two to three hours. Prevailing winds are southerly and produce generally fair skies.

Geology and Soils

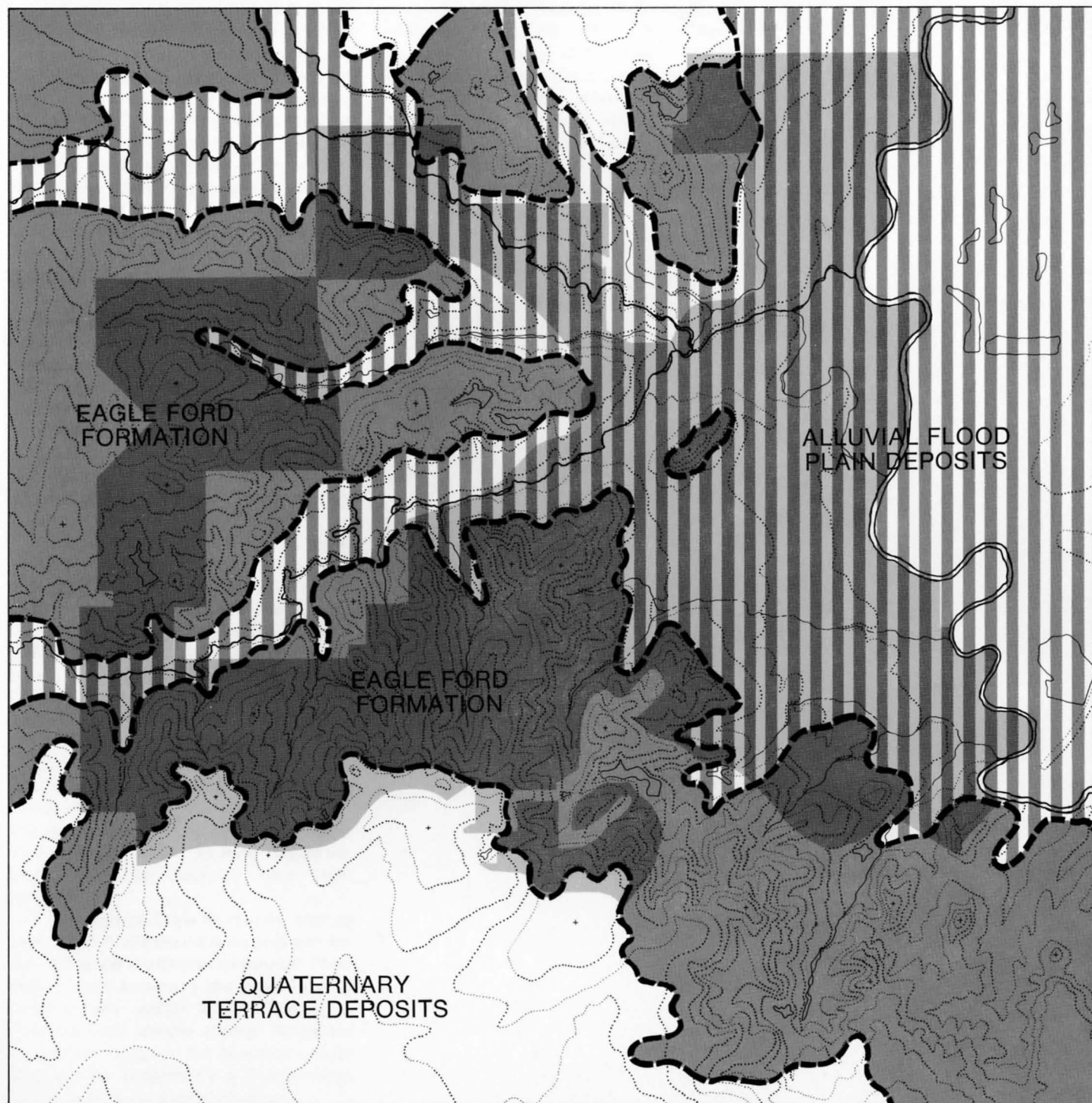
Three broad bands of cretaceous rocks lie exposed on the surface of Dallas County—the Taylor marl to the east, the Austin chalk in the center and the Eagle Ford shale outcrops to the west. Though its outcroppings are potentially wide, most of the Eagle Ford shale lies hidden at different levels by stream-bottom alluvium and terraced gravels.

Probably by the late Tertiary the Trinity River had become the region's dominant stream. Its course finally developed along the strike of the soft Eagle Ford shale which it eroded more rapidly than the harder Austin chalk. Cutting deeper and deeper into the shale, the waters left remnants of the older flood plains, now terraces, high above the bed of the river.

It is this Eagle Ford formation which underlies the Las Colinas acreage. In Dallas County, its thickness ranges from 475 to 400 feet, and is characterized by rolling terrain and a light growth of mesquite. It is an excellent foundation strata, composed primarily of dark shales with an occasional very thin sandstone or limestone stratum. Calcareous concretions, thin bentonite beds and pyrite are found throughout the formation.

The residual soils of the Eagle Ford are typically thick and are known as the Houston and Houston-black clays. They are highly active and subject to large volume changes corresponding to seasonal variations in moisture content. With depths averaging 24 feet, these overburdened soils are found in the ridges emanating from the southern and western boundaries of the acreage. The clays are generally very similar and grade from light brown at depth to black at ground level. Moisture content becomes fairly stable between 12 and 14 feet beneath the surface.

At higher elevations along the southern boundary, alluvial terrace deposits are found overlying the Eagle Ford forma-



tion. Deposit thickness varies, but rarely exceeds 30 feet. A water table is often encountered along its contact with the shale. This material, composed mainly of sand, sandy clay and gravel, was deposited by the Trinity River when its flow level was much higher. Surface soils are typically sandy and lighter in color than the residual Eagle Ford types and support the occasional growth of oak trees. These soils are somewhat less active, although they still possess a high shrink-swell potential.

Alluvial flood-plain deposits overlie the Eagle Ford shale at lower elevations along the Elm Fork and major creek beds. The surface of these more recent deposits is a dark, active clay which grades with depth into silt, sand and gravel. The clays are found at or near optimum moisture level, with water-bearing sands and gravel under artesian pressure. The thickness of the deposits varies, and may be found as deep as 75 feet.

The topography of the Las Colinas acreage is directly related to the combined natural characteristics of its nine separate soil series. Each has been identified and classified according to its physical properties and degree of limitation affecting improvements. Construction methods, landscaping techniques and conservation measures all must respond appropriately to these soil conditions.

Preliminary investigations show that, in certain areas, depths of effective bearing strata and inherent soil properties vary. For general purposes, relative compressive strengths, allowable bearing capacities and indices of elasticity have been assigned.

In the residual Eagle Ford soils, bearing capacity and settlement is no problem for lightly-loaded residential structures. Their design must recognize the possibility of swelling and uplift due to the soils' potential high volume change. Adequate foundation support for heavy structure loads can be provided by drilling footings to the underlying shale formation.

Various studies indicate that expansive soils do exist, yet the high volume changes occur only when a combination of certain mineral constituents and climatic conditions are present. There are recommended standard techniques of construction and normal precautions to control soils typical of this region. Detailed engineering will be required of individual projects as they are undertaken.

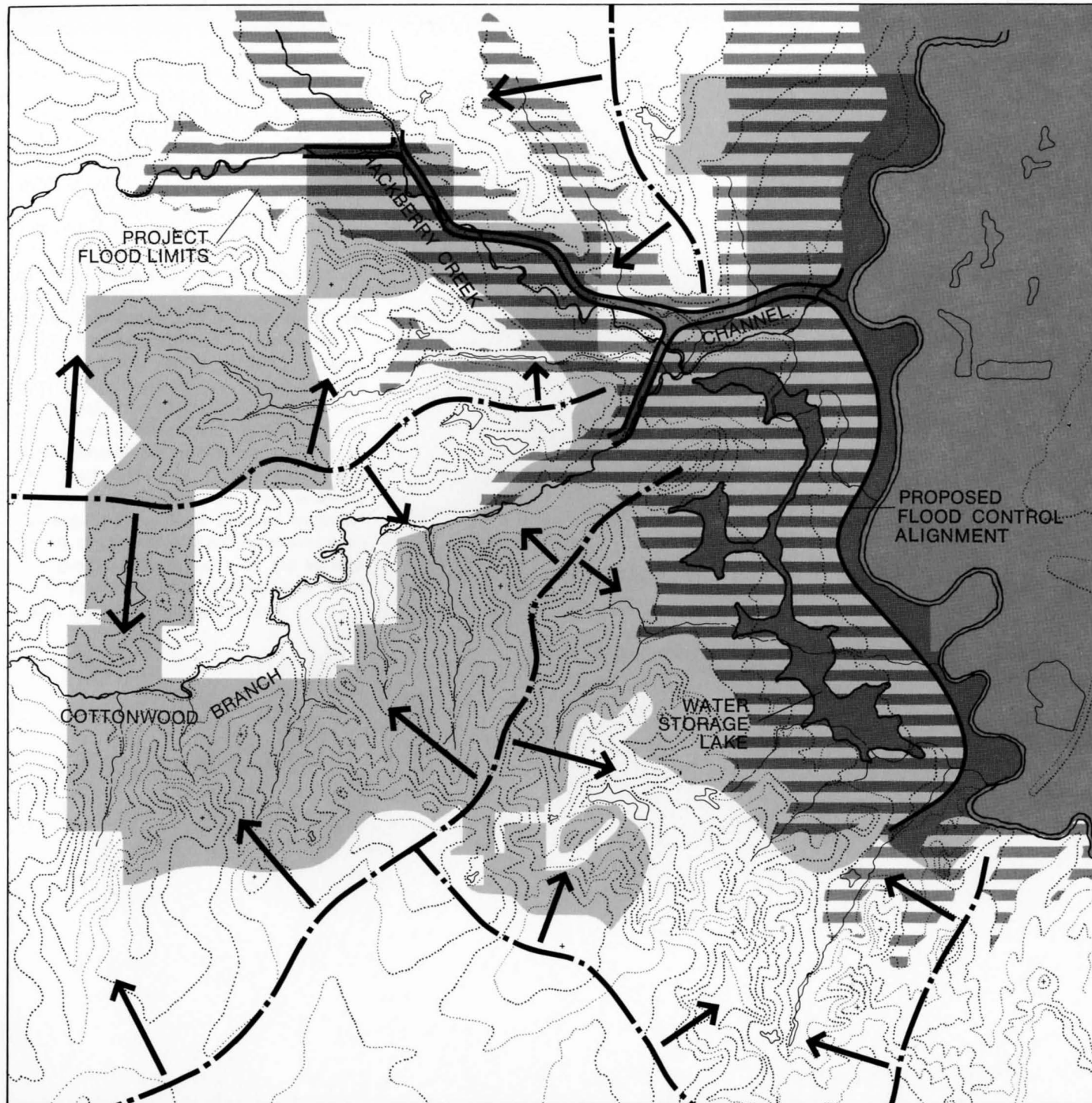
Drainage and Flood Control

The Elm Fork of the Trinity River now flows unimpeded along Las Colinas' eastern border. As part of the overall Trinity River system, its flood characteristics have been thoroughly studied by the Trinity River Authority and other agencies.

Though upstream reservoirs and downstream channel improvements have reduced the Elm Fork's previous record flood limit, a significant land area is in the flood plain and still subject to periodic inundation. As such, extensive reclamation measures are required to render it useful. Heavy rainfall, coincident with backwater conditions on the Elm Fork, clearly indicate the inadequacies of existing protection for total conservation and improvement of the area.

In addition to the river, the land is subject to other distinct drainage patterns, all tributary to the Elm Fork. Convergence of these drainage ways along the eastern boundary greatly affects internal site planning. With a total drainage area of approximately 9,700 acres, Hackberry Creek is the largest of these subordinate waterways. It extends about 7 miles west of the Elm Fork. Construction of the new regional airport will concentrate a discharge into the creek approximately 2 miles upstream from Las Colinas, thus altering the natural pattern of the tributary. This condition does not apply to the Cottonwood Branch, although it does drain some 3,000 acres east of the airport. A lesser drainage area of about 1,400 acres is defined by ridges surrounding University Hills.

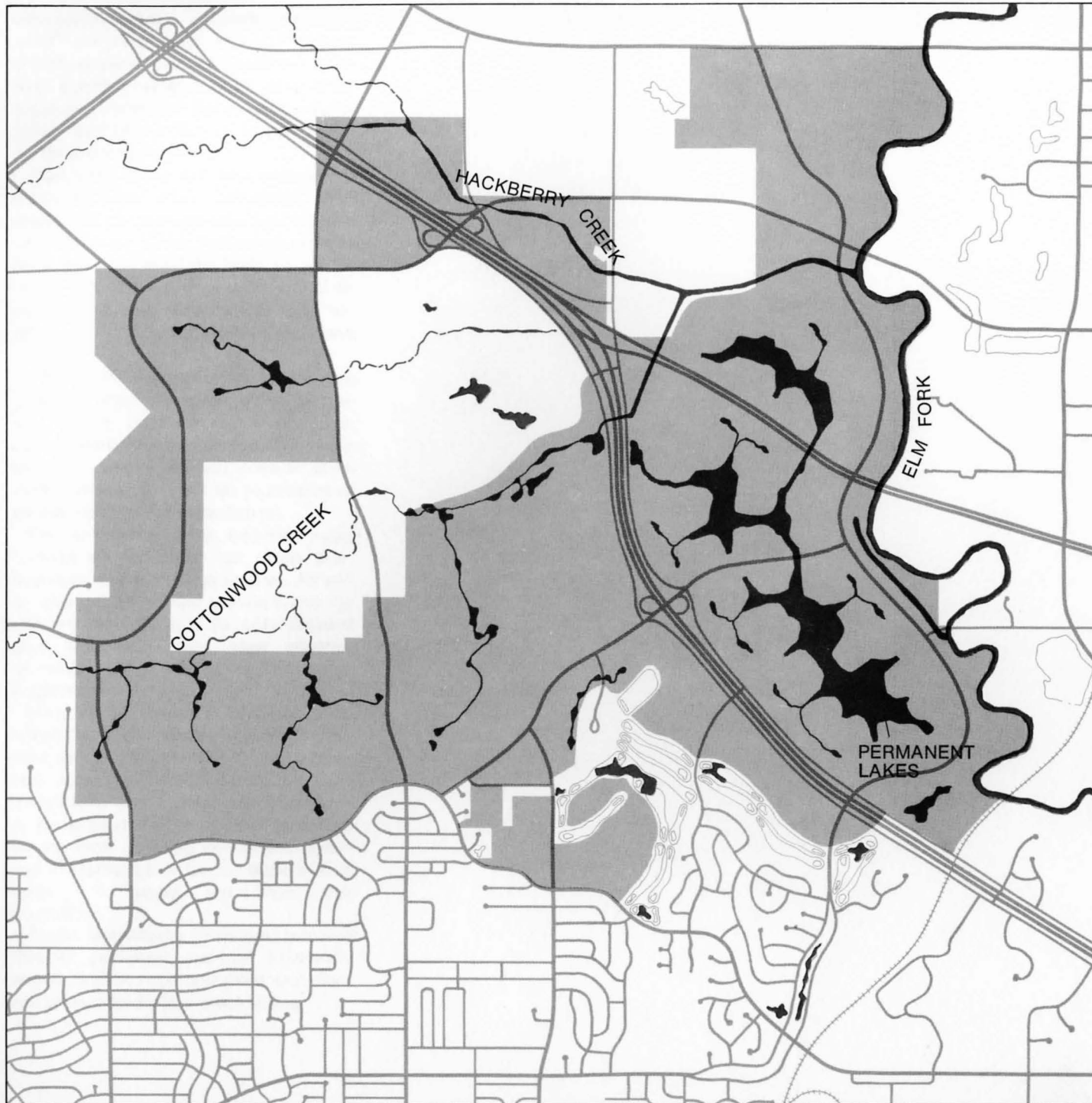
Detailed engineering studies have established standard project flood limits and design criteria, considering all pertinent conditions of location, meteorology, hydrology and terrain which included a recommendation to incorporate the park lands adjacent to Las Colinas as part of the natural floodway. Levee construction, grade changes and other requirements



proposed within the acreage conform to these overall plans. Engineering will be coordinated for the various river crossings and other thoroughfare modifications.

The proposed flood control alignment within Las Colinas is delineated by gradual curves, 500 feet back from river center. Parallel to these, an overflow channel will be formed to preserve the river's meandering quality and provide a backwater area below California Crossing. The floodway will be carefully improved to insure efficient flow and preserve its natural appearance. To the interior, Hackberry Creek and a portion of the Cottonwood Branch will be improved.

The Texas Water Rights Commission has authorized the formation of a municipal utilities district to effect the protective improvements. Drainage and flood-control provisions are integral to the master utilities system which will benefit Las Colinas. As this work is required before more detailed improvements can be made, it will be phased with the general development of the acreage and accomplished in accordance with other aspects of the master plan.



Waterways

The extensive provisions required for flood control and internal runoff imply that water will play a role inseparable from development in Las Colinas. As such, a continuity of waterways can be created within the acreage, which will both capitalize upon these necessities and notably enrich the total environment.

A waterway system is proposed in the form of a series of man-made lakes, ponds and interconnected water courses. Natural drainage ways will be exploited and configured for maximum visual impact and functional benefit. Properly designed, these waterways will extend a quality of tranquility to the environment, intensifying the community's natural character.

The largest of these water bodies is located in the eastern portion of the acreage. Here water will be established as a major element of the plan. Creation of permanent lakes was suggested as a counter-proposal to the intermittently dry sumps studied by the Corps of Engineers. As a result, recreational and aesthetic considerations are combined with mandatory requirements.

By using a combination of stone structures and landscaping, the banks of these lakes can accommodate water-level fluctuations. Normal levels will be maintained by periodic pumping from the Elm Fork. The water is shaped to provide optimum frontage for development and sufficient area for sailing small craft. Canals, coves and inlets will add variety and interest.

The character created by the lakes will be extended to the remainder of Las Colinas, principally by the improvement of Cottonwood Creek. Water bodies, strategically placed on either side of Carpenter Freeway, will achieve a strong visual connection between the creek and lake development. As these are functionally independent, they cannot be physically connected. Cottonwood Creek, in its natural state, is essentially dry. Its intermittent flow will be conducted by

informally defined channels. Excessive runoff will be diverted into an improved branch channel beyond Carpenter Freeway. Standing water is to be retained by occasional retention dams, designed for proper hydraulic effect, or supplemented by the raw water system.

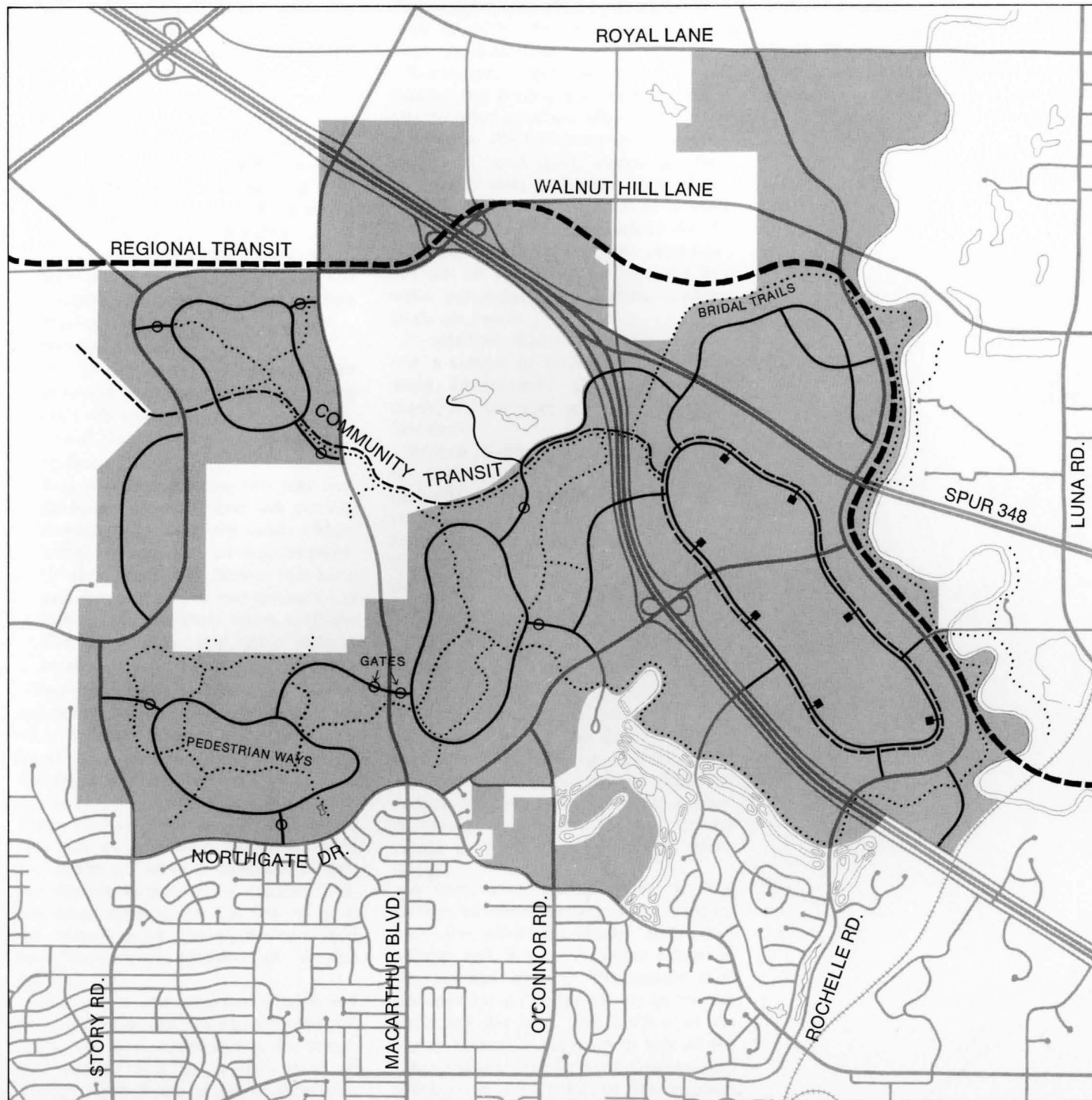
Hackberry Creek will be landscaped in harmony with other waterways. This creek, and the partially-improved channel of Cottonwood Creek, will continue to be backwaters of the Elm Fork at certain times. Thus adequate provisions will be required to stop reverse flow from entering the major Cottonwood Creek reserve.

As with the open space and landscaping program, implementation of the waterway system is to be coordinated with overall development. Construction of the primarily lake areas will precede other improvements and will be accomplished by the municipal utilities district.

For continuity, other essential water features are indicated near major thoroughfares and the village squares. All will be appropriately scaled as focal points for adjacent development. As only detailed plans will define their most effective locations, they are at present only suggested.

Many of the natural drainage ways are integral to the waterway system. Precautions should therefore be taken to minimize water-quality degradation. Sites for certain land uses, such as gas stations, are to be so located as to prevent associated wastes from entering permanent waterway elements. Local terrain slope will be studied to assess and avoid this possibility.

Proper landscaping treatment, achieved through recurrent use of informally placed natural rock and plant materials, will protect banks and lessen silting.



Traffic and Transportation

Bounding and traversing Las Colinas are numerous thoroughfares under city, county and state jurisdiction. They form an integral part of the transportation network for the environs and the region. Early approaches and alignments were established as the areas surrounding Las Colinas acreage were developed. More recently proposed thoroughfares have evolved through cooperation with local authorities seeking to accommodate mutual criteria within Las Colinas' master traffic system.

Traffic and transportation, in its regional context, has been discussed previously. A brief description of the functional requirements and qualitative implications of each thoroughfare in the Las Colinas acreage follows.

- John W. Carpenter Freeway (State Highway 114)
This is the major thoroughfare within Las Colinas acreage. It affords immediate access to the State highway system, to downtown Dallas and to the northern terminals of the new Dallas-Ft. Worth Regional Airport. With 3½ continuous miles of frontage road to be planned, the freeway is important not only for its economic value, but for its potential for presenting the identifiable characteristics of Las Colinas to a large volume of traffic.
- Spur 348 (Northwest Highway)
Joining Carpenter Freeway after crossing the Elm Fork of the Trinity River, this existing route provides access between Love Field and the northern terminals of the Regional Airport. While not carrying the volume of the freeway, its developed frontage contributes economically to the reclaimed flood plain and becomes a key eastern entrance to the urban villages.
- Walnut Hill Lane
This proposed county thoroughfare

will connect North Dallas with the Regional Airport and could become an 'overlook' road traversing some of the higher terrain within the acreage.

- MacArthur Boulevard
Extension of this North-South thoroughfare will provide access to downtown Irving and north to the Freeway. As a secondary entrance to Las Colinas, it will traverse rolling terrain immediately north of Northgate Drive and cross Cottonwood Creek. Views from this thoroughfare will reflect the intimate character of the proposed development.
- O'Connor Road
This existing city thoroughfare will be extended to connect downtown Irving with the urban villages. It will terminate at Rochelle Road.
- Rochelle Road
This city thoroughfare will pass over Carpenter Freeway and will provide immediate access to the urban villages and University Hills. Joining California Crossing, Spur 348, Walnut Hill Lane and Royal Lane, it will connect Las Colinas and Northern Irving with the Elm Fork Park and other natural areas.

Four thoroughfares frame Las Colinas and define a transitional zone from which other minor entrances may be established. They are Royal Lane to the north, Northgate Drive to the south, Luna Road to the east and Story Road to the west. These thoroughfares also provide access to other points within Northern Irving and Dallas and serve to complete peripheral circulation around the acreage. Thoroughfares crossing the Las Colinas acreage, as well as all interior roadways, will have landscaped medians of varying widths.

Both urban and suburban villages will be served by gently curving loop collector roads. The loop roads within the suburban villages will be private, with an average right-of-way of 60 ft. Access to

them will be controlled by entrance gates at points where they are extended to the major thoroughfares.

Allowances within Las Colinas for pedestrian and bicycle movement are necessary to offer a realistic alternative to the automobile. By following the connecting system of open space, pedestrian ways may easily serve to further unite all the villages. Where they are required to cross thoroughfares, grade separations will be provided wherever possible. Walkways will not be contiguous to roadways, but rather will meander through the adjacent landscaped areas.

In addition, Las Colinas will incorporate a system of bridle trails, primarily along Cottonwood Creek, Hackberry Creek, and the open space park along the Elm Fork.

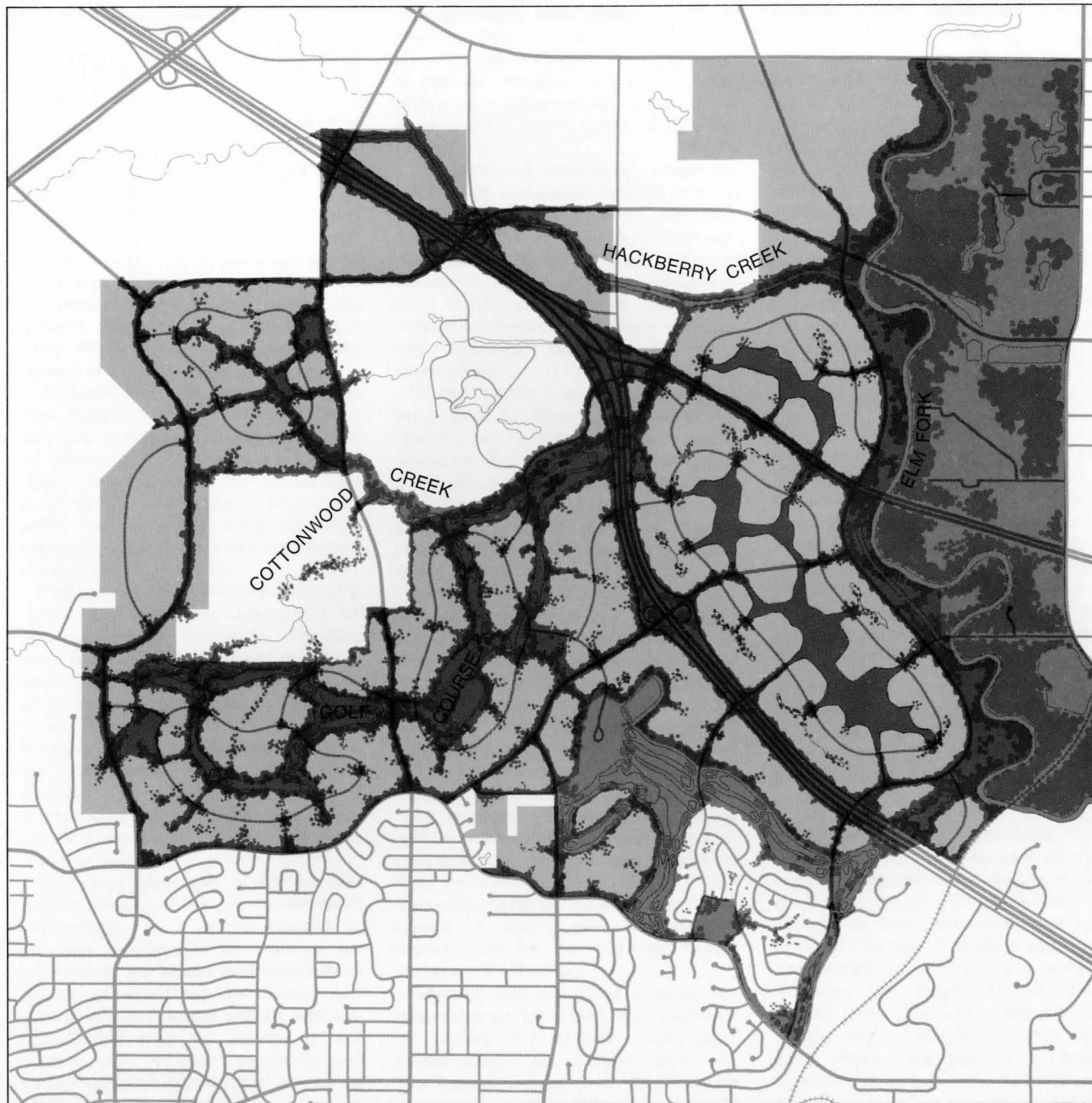
Various studies have projected the need for a rapid transit system to serve the Dallas-Ft. Worth metropolitan area. Participation by Las Colinas within such a system is highly desirable, particularly for effective relationship of its urban areas to the regional airport and downtown Dallas.

A 4.5-mile right-of-way for regional rapid transit has been proposed in the Master Plan to encourage this participation. Entering from Dallas, the Texas Stadium, University of Dallas, the route curves parallel to the Elm Fork and Hackberry Creek channel. It then crosses the John W. Carpenter Freeway to parallel Walnut Hill Lane westward to the airport. A transit station site for Las Colinas would be located central to the urban villages.

A community transit system for Las Colinas has been considered, to interconnect the suburban villages and urban villages, and, in turn, the urban villages to the regional airport. The master plan provides for a right-of-way to be located encircling the lake. This portion of the transit system is designed to link all the urban villages, continue up Cottonwood Creek, and then cross to the regional

airport boundary.

Any such system would be developed in stages. The first stage would probably be small buses. Later development may warrant a more sophisticated system linking Las Colinas directly to the airport's internal transit system.



Open Space and Landscape

The open space and landscape of Las Colinas can contribute permanently to its 'sense of place'. By virtue of single ownership, there exists the capacity to uniquely transform a significant portion of the present landscape pattern. Exceptional opportunities are afforded by the land itself, as well as its surroundings. The landforms and watersheds of the acreage permit ready adoption of open-space concepts recommended in regional plans for urban improvement.

The discernible quality of Las Colinas will be heightened by continuous perception of a natural environment. This environment will coordinate and absorb a diversity of improvements and architectural elements, properly planned and implemented. The desired environment is one that will seem to have preceded development, rather than to have resulted from independent projects.

To establish an effective environmental theme for the acreage, land will be allocated to preserve and extend the existing natural character. Continuous 'greenways' are proposed, to retain principal drainage ways and unify developments. This matrix of open space serves to identify areas for recreation and conservation, as well as developable parcels of land. It delineates the major thoroughfares, pedestrian circulation ways and utility alignments.

Though allocations of open space within the acreage are classified in a hierarchical system, each is nevertheless important to overall development quality. Primary open-space is that land essential for recreation and conservation and is to be preserved for the entire community's common use and benefit. Secondary open space is to be retained by setbacks and protective covenants concomitant with title to the land. Tertiary open space will be defined during detailed planning of individual parcels by specific requirements, to integrate each development

into the overall pattern.

Primary open space will include portions of Cottonwood and Hackberry Creeks and areas within the Elm Fork floodway. These will extend the natural aspects of the Elm Fork to the interior of Las Colinas. Because of its central location and elongation, Cottonwood Creek will be improved as a natural 'spine' of recreational activity. Emanating from it into the adjacent villages will be golf course fairways and informal patterns of circulation. Future plans for Northlake Community College will undoubtedly preserve areas along the Creek and thus relate the campus to the open space pattern of Las Colinas.

Although they still remain subject to peak flood conditions, Hackberry Creek and land contiguous to the Elm Fork will be improved by the municipal utilities district as an adjunct to the regional open space system. Picnic areas, bicycle and bridle trails proposed along the river's edge within Las Colinas will complement those in the adjacent park.

Rights-of-way for thoroughfares adjacent to and within Las Colinas offer an opportunity for important secondary open space. They will be properly landscaped, and visually augmented by appropriate setback restrictions. In residential areas, they will provide buffer zones between dwellings and vehicular traffic. In non-residential areas, such as along freeways, they will allow introduction of created land forms and large groupings of plant life that can be viewed effectively at highway speeds.

Secondary open space is also intended around the lake in the eastern portion of the acreage. It is to be planned to promote coordination of shoreline improvements and ensure appropriate modulation of waterfront open space, even though actual frontage will be sold and construction may be allowed to the water's edge. Flexible easements will permit continuous pedestrian circulation around the lake perimeter.

In principle, such greenways follow subtle undulations of the terrain, forming areas for passive activity. Their purpose is to maintain the continuity of the pedestrian system and avoid the appearance of separate green islands within the various project areas.

The proposed open-space pattern for Las Colinas is designed both to retain a large portion of the present vegetation and to use it to advantage. Although many existing stands of timber and other vegetation will be preserved, additional plant life is required to strengthen the natural environment and create an effective landscape statement for total development.

Of existing plant associations, only the bottomland hardwoods can provide significant cover in natural areas without the assistance of a long-term landscaping program. The native mesquite rarely attains heights conducive to ground development. However, the plant has definite potential if used as natural cover in casual or scenic areas.

To distinguish Las Colinas from its environs, a repetitive theme of identifying plant life and landscape techniques is proposed. Both native and introduced varieties will be utilized for maximum effect. The low mesquite cover will be punctuated by random groupings of taller, more stately trees. Continual color will be introduced by flowering trees and foliage responsive to seasonal variations.

An ecological system of landscaping will be employed. Introduced plant varieties will be compatible with indigenous ones, to minimize the potential of noxious plants invading natural areas. Regeneration of existing stands will be promoted, both for their inherent beauty and as wildlife habitats.

Selected dominant plant materials are recommended for coordinated treatment of primary and secondary open-space. Other varieties are identified to harmonize actual project areas. Species have been chosen that contribute to an overall

informal quality rather than a highly structured pattern. Although detailed placement is not yet definable, general location and use criteria are suggested.

A classic texture of trees is to be exhibited throughout the acreage. This is achieved by solid tree outlines, symmetrical forms in foliated states, and strong, rigid branching patterns in fall and winter conditions. A recommended tree list has been proposed. It is composed almost entirely of natives, the only exception being the Chinese Sour Gum.

Overall guidelines for planting composition in primary and secondary open space are as follows:

Primary Open Space

Riparian Zones: Trees in these areas should be planted in groves of seven or more, with no more than two different species in a single grove. Willow trees can remain in smaller clusters, but never in groups smaller than three; their numbers will be few compared with the other large species. Elderberries will be used in mass plantings of twenty or more to aid in flood erosion control.

- ☐ Pecan
- ☐ White Ash
- ☐ Honey Locust
- ☐ Weeping Willow
- ☐ Elderberry
- ☐ Cedar Elm

Meadows and other Open Areas: These areas will receive vast numbers of trees, but clustering will allow a feeling of open ground to prevail. These clusters will contain no fewer than nine trees each. They will be spaced to allow ample root and branch development and minimize irrigation line length. Cluster shapes should respond to site topography and should vary in size within each visual zone. Again, the number of species should be limited to three within a series of groves, providing a gradual visual tran-

sition to other species.

- ☐ Pecan
- ☐ Common Persimmon
- ☐ Eastern Red Cedar
- ☐ Chinese Sour Gum
- ☐ Shumard Oak
- ☐ Cedar Elm

Street Planting: Street planting will not define the roadway line, but will blend into the configuration of adjoining open space planting. Trees within each cluster may be more widely spaced than in the meadows, but not more than 35 feet on center. Within each 800 feet of roadway there should be no fewer than three clusters of these trees, with no more than two different varieties in each.

- ☐ Common Paper Mulberry
- ☐ White Ash
- ☐ Shumard Oak
- ☐ Cedar Elm

Trail Planting: Again, this planting will not define the trail line, but will offer occasional wind buffer or shade canopy. The form, however, should relate to the rest of the primary areas. Clusters are to be of at least five trees.

- ☐ Common Paper Mulberry
- ☐ Eastern Redbud
- ☐ Shumard Oak
- ☐ Cedar Elm

Windbreak Planting: The intent of planting tree rows is three-fold: to force air currents upwards; to leave a cross-sectional gap where debris may be dropped as air speed is reduced; to further slow the air as it returns to ground level. The rigidity of continuous banding may be lessened by planting rows of 60 to 80 feet offset lengths.

- ☐ Common Persimmon
- ☐ Eastern Red Cedar
- ☐ Osage-Orange
- ☐ Chinese Sour Gum
- ☐ Shumard Oak
- ☐ Mescal-Bean

Secondary Open Space

Freeway Screen: Along primary or other large, open areas, the grove screen should be denser and more elongated. Each grouping should have three to four vertically-growing species, differentiated by habit and foliage type. Freeway lengths adjacent to highly-developed regions generally have less planting space than other areas. These will receive a double- or triple-row screen, consisting of two species differentiated by height and evenly spaced at 12 feet on center and 12 feet between rows.

- ☐ Common Paper Mulberry
- ☐ White Ash
- ☐ Eastern Red Cedar
- ☐ Osage-Orange
- ☐ Chinese Sour Gum
- ☐ Shumard Oak

Street Planting: Large groupings of trees will minimize maintenance and will require less expensive irrigation systems. Immature trees protect each other and thus are more likely to survive. The danger is in planting the trees too close together, or in planting clusters too near overhead or underground utility lines. Street planting clusters should have at least three trees each, with a maximum spacing of 80 feet between clusters. The number of species per 1000 feet of street should be three or less.

- ☐ Common Paper Mulberry
- ☐ Pecan
- ☐ Downy Hawthorn
- ☐ Common Persimmon
- ☐ Common Pear
- ☐ Cedar Elm

Pedestrian and Bicycle Trails: The trail system should not be delineated from its surrounding open space. However, where trails traverse residential zones, they should be lightly screened from private property, more heavily screened at road intersections and topographic high points

exposed to wind. Clusters should contain at least five trees, of no more than two species each, with larger species types dominating smaller ones.

- ☐ Common Paper Mulberry
- ☐ Eastern Redbud
- ☐ Common Pear
- ☐ Shumard Oak
- ☐ Cedar Elm

Entryways: Vegetation at entryways should continue the non-showy plant groupings that establish the texture of Las Colinas. Cluster formation may be more formal here, but plant life should be the same as used elsewhere, limited to two varieties at any one entryway.

- ☐ Downy Hawthorn
- ☐ Common Persimmon
- ☐ Chinese Sour Gum
- ☐ Shumard Oak

Large trees should be planted first. Even if grown initially in a nursery, they will adjust to the soil and climate of the site and transplant much more successfully. These specimens include:

- ☐ Pecan
- ☐ Common Persimmon
- ☐ White Ash
- ☐ Eastern Red Cedar
- ☐ Chinese Sour Gum
- ☐ Shumard Oak
- ☐ Cedar Elm

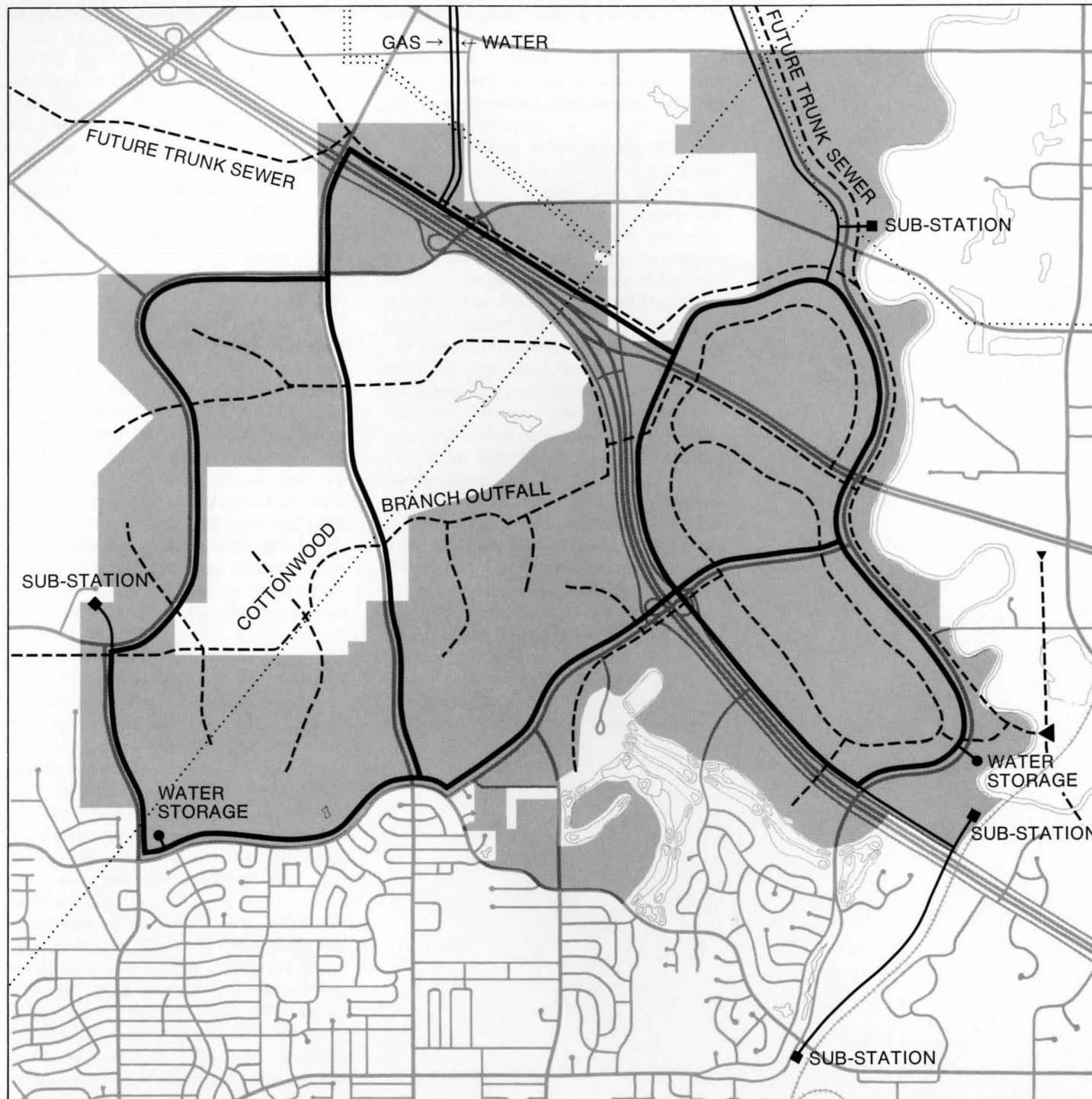
Maintenance begins with an irrigation system. Healthy rapid growth requires proper watering, especially during early growth. An irrigation plan must first be devised according to land uses and pedestrian trail systems as master-planned.

Primary open space should be provided with a complete irrigation system to initiate solid vegetable stands. To deter erosion caused by wind and rain, this cover should be established before extensive construction begins. As regrading lines in secondary open spaces become fixed, a main irrigation line should be laid from which laterals can expand into

secondary and even tertiary open space.

The installation of a nursery is quite feasible and can render many benefits. Besides assuring the availability of recommended tree species, it would also aid in maintaining size, shape and in some cases color uniformity. Transplanting should be faster, more successful and less costly due to shorter transporting distances. If the nursery were to become a commercial outlet to future property owners of Las Colinas, the long-range, unified character of the plant community would also be enhanced. Should this alternative not be realized, it is recommended that local nurseries be contracted at once, to begin collecting and growing the large quantities of species required.

On-site transplanting will be limited to small, healthy specimens, notably species types recommended here. A forester's survey will be needed to locate and describe individual trees and to ascertain the quantity and cost advantages of undertaking a transplanting program.



Utilities Distribution

The Las Colinas acreage lies within the most available expansion area of the metropolitan complex that can be served reasonably by utilities. Plans for the entire city of Irving indicate that major elements of distribution systems required for its northern expansion are either on or must pass through the acreage. Thus, the acreage can be served readily as it is developed. To coordinate Las Colinas' eventual demands with those of Irving, alignments for various utilities lines are proposed. They use portions of existing systems and principles of distribution suggested by previous engineering studies; they do not, however, connect with the regional transmission lines within the acreage.

The master utilities system for Las Colinas consists of sanitary sewers, provisions for storm drainage, gas, electrical and communications lines, and domestic water supply, including fire protection and untreated water for irrigation. Elements of the system will be placed underground, in easements that parallel major thoroughfares or lie within open space reserves. Although the new municipal utilities district will undertake portions of this network immediately, these will be designed and sized to permit growth in several stages.

Sewage from Las Colinas, as well as from Northern Irving, will be collected and carried south by city-owned mains to a treatment plant operated by the Trinity River Authority, in the city of Grand Prairie.

Topography divides the acreage into natural service areas. One existing trunk sewer, the Cottonwood Branch outfall, extends across the acreage to join a smaller line from University Hills at the eastern boundary. There, by inverted siphon, a terminal trunk passes under the river to the main Elm Fork interceptor. Due to the proposed construction, portions of the Cottonwood trunk and

the smaller line must be relocated.

New branch sewers and future trunks serving Northern Irving will follow the principal drainage ways, circle the flood plain, and join the main terminal trunk at the Elm Fork. Branch sewers will range in size from 24- to 36-inch diameter. Laterals and stub-outs will be provided as detailed requirements become apparent.

Easements for gas, electrical, and domestic water distribution will be combined to form three major loops within the acreage. Developable land adjacent to the Las Colinas Country Club and University Hills will be served primarily by extensions from utilities along Northgate Drive.

The gas distribution system will be installed and maintained by the Lone Star Gas Company. A 24" main, parallel to Love Drive, will tie the loop systems into their existing line along Royal Lane. To equalize pressures, the southern extremities of these loops will connect with existing gas mains along Northgate Drive. Pipe sizes within the loops will vary from 6 to 12 inches. The system will include in-line valves and stub-outs for feederlines to interior parcels.

Electrical power will come from four sub-stations. Two already exist close to the acreage and will be supplemented by two new sub-stations within Las Colinas. Their locations are proposed to the northeast and southeast, along the Elm Fork. Electrical distribution will be installed and maintained by the Texas Power and Light Company. As all services within Las Colinas are to be underground, the developer will pay the premium for such installation.

Domestic water will come from the City of Irving. Most of the acreage lies within a service area at a different elevation from areas south of Northgate Drive. As a result, the 36" and 48" mains, proposed to supply Las Colinas from the north, will couple with new pumping stations and both elevation and ground storage reservoirs required for efficient

system operation. City proposals indicate an elevation storage reservoir near the intersection of Story Road and Northgate Drive, as well as a ground storage reservoir in conjunction with booster facilities near the Elm Fork.

The untreated water system will provide raw water for irrigation purposes. The flood-control lakes will be the primary source of supply for the areas east and north of the Carpenter Freeway. During periods of inadequate run, supplementary supply and make-up water will be purchased from the City of Dallas and pumped from the Elm Fork. The system will consist of pumping stations along the river and additional facilities adjacent to the lakes. They will be required to assure adequate mains pressure. Westward expansion of this system will be determined by detailed analysis of development requirements.

Telephone service with Las Colinas will be provided by two companies — Southwestern Bell and General Telephone. Major lines of these companies were joined recently at the John W. Carpenter Freeway. Areas west of the Freeway will be served by General Telephone; those to the east, by Southwestern Bell.

Provisions for cable television are minimal, and allowances will be made within the overall framework of easements.



Airport Impact

The Dallas-Ft. Worth regional airport occupies some 18,000 acres adjacent to Las Colinas. On an east-west axis, its greatest width will be about 7 miles. Upon completion, 13 semi-circular terminal buildings will be located along a main north-south access road, approximately $3\frac{1}{2}$ miles from the acreage's western boundary.

Four major runways, two on either side, will parallel the airport's north-south 'spine'. Situated at angles to these, two additional runways complete the wide configuration. Construction and extension of the runways will be phased with anticipated operational demands and overall facility development.

Runway 13 Left/31 Right, the oblique runway on the eastern side of the airport, is of particular interest to Irving and Las Colinas. The landing and take-off patterns from this runway pass over the northern part of the city and the southwest portion of the acreage.

Restricted air space, required for proper flight-pattern clearance, has been identified by airport engineers. Three-dimensional zone boundaries have been incorporated within the airport's zoning ordinance. A hazard zoning map establishes contours, or vertical limits, to construction near the airport. These controls place no significant restriction upon the Las Colinas acreage considering its master development plan. The lowest height limits are at the western edge of the acreage, where any construction must be below 100 feet.

The restraints most difficult to define are those involving potential aircraft noise effects upon the environment. Numerous efforts have been made, by both airport board consultants and others, to predict the acoustical disturbances of overhead flights and establish proper criteria for surrounding development. Continual re-evaluation of noise guidelines will inevitably occur as air-traffic volume, aircraft

mix and runway use patterns evolve and alter the nature of the disturbances.

Certain benefits will accrue as engine designs are improved and existing engines modified. Adoption and enforcement of new approach techniques and noise-abatement measures by airport management are also anticipated to reduce the noise 'footprint' on adjacent communities.

Peak noise levels generated by anticipated aircraft operation have been studied and the data translated into noise-level contours and zonings. These identify community areas within which various noise levels may occur. Comprehensive analysis of all factors affecting noise over Las Colinas has localized its effect to particular areas. Although the level of noise events for arrivals and departures are different, the areas affected are generally confined to a 'corridor' approximately 2000 feet wide under the extended centerline of runway 13L/31R. Therefore, only a portion of the total Las Colinas acreage will be affected by aircraft noise, and from a development standpoint the land uses proposed can be successfully marketed. Actual experience and comparisons with areas in equal proximity to other airports have shown this assumption to be reasonable.

It is recommended, however, that single-family homes be located outside this 'corridor' and that the orientation of any major structures planned there be studied.



Zoning and Land Use

For planning purposes, the Las Colinas acreage may be seen as divided into seven major Sectors — each identified by a Sector number. Each Sector possesses distinct environmental characteristics, each is clearly marked by natural boundaries or major thoroughfares, existing or planned, and each is unified within the total framework of Las Colinas.

Each Sector may then be subdivided into a number of distinct parcels for specific land uses and marketing. In preparing more detailed area plans for each Sector, the master plan for development has made initial proposals for such subdivisions. These area plans will, of course, be subject to changing conditions caused by evolving development.

Although integral to the total area known as Las Colinas, the lands of Hackberry Ranch, the Las Colinas Country Club, University Hills and the Northlake Community College campus are not included within these Sectors.

Sector boundaries do include certain smaller holdings not now owned by Las Colinas Corporation. These can either be acquired or be incorporated by agreement into the plan to assure coordinated development.

Brief descriptions of the Sectors follow:

East Sector 1 occupies a majority of the reclaimed flood plain and benefits directly from lake development and considerable frontage on Carpenter Freeway. 970 Acres

Southeast Sector 2 embraces the lands adjoining the Las Colinas Country Club and is contiguous to both University Hills and the Freeway. 272 Acres

South Central Sector 3 contains higher terrain affording views of Dallas, relates directly to the Freeway, and adjoining Cottonwood Creek. 459 Acres

Southwest Sector 4 is adjacent to existing residential development south of Northgate Drive and is partially subject to aircraft overflight. 406 Acres

Northwest Sector 5 contains rolling land, with the least natural vegetation of any Sector. It adjoins Hackberry Ranch to the east. 218 Acres

Northwest Sector 6 gathers together the somewhat fragmented parcels which buffer the acreage from the airport lands to the west. 219 Acres

North Sector 7 contains all remaining parcels north of the Freeway which have been designated for 'future' development and which are to be held for future planning considerations.

Creative zoning must be devised for Las Colinas as a wide variety of land uses are possible and many of these will be chosen for development over an extended period of time. Moreover, this variety is desirable. The overall community concept calls for differing environmental characteristics and varying percentages of land-use types within each of its parts. Optimum land use required dynamic, flexible balance and adequate definition of commitments to the overall goal of environmental quality.

Other developments have set precedents for achieving such goals. The means used by these projects has been the creation of 'planned unit developments', or PUDs. Benefits made possible through judicious land use and innovative planning have been enjoyed by both municipality and developer. Road construction and utility distribution economies have resulted. Recreational and natural areas have been created and maintained by protective covenants that unify the entire community. Mixtures of compatible land uses have been achieved.

The magnitude of development planning for Las Colinas suggests PUD zoning for its unique circumstances.

The entire Las Colinas acreage may be identified as a 'planned community district' composed of 'planned unit developments' corresponding to the separate Sectors. Thus Sectors may be identified for either 'urban' or 'suburban' planned unit developments (PUDs).

Sectors identified by this zoning are described as follows:

East Sector 1 is proposed for the urban planned unit development. Selection of this location for highest-density land use is practical because of its immediate accessibility to regional circulation and remoteness from existing low-density developments. It is desirable further because it enjoys maximum exposure to open space and must use extensive man-made improvements.

Sectors 2 through 6 are identified as suburban planned unit developments. They define land with considerable natural amenities and are contiguous to existing residential areas of Irving. As such, they form transitional areas more appropriate for the medium-density applications intended.

Sector 7 will not be identified for zoning until its optimum use can be determined more accurately.

Open space within the Las Colinas acreage includes the 18-hole golf course, the 125-acre lake, park lands along the Elm Fork and in Northwest Sector 5, and dedicated rights-of-way along public thoroughfares. This open space is to be extended by easements that will provide the recreational system of pedestrian, bicycle and bridle trails linking all the villages, and by development controls governing set-backs, ground coverage and landscaping within each parcel and lot.

The development plan projects some 8,600 dwelling units for Sectors 2, 3, 4 and 5, resulting in a projected resident population of around 26,000 in these four suburban villages. Average net densities are anticipated to be 9 du/acre in Southeast Sector 2, 6.3 in Southcentral Sector 3, and 7.9 in Southwest Sector 4 and Northwest Sector 5.

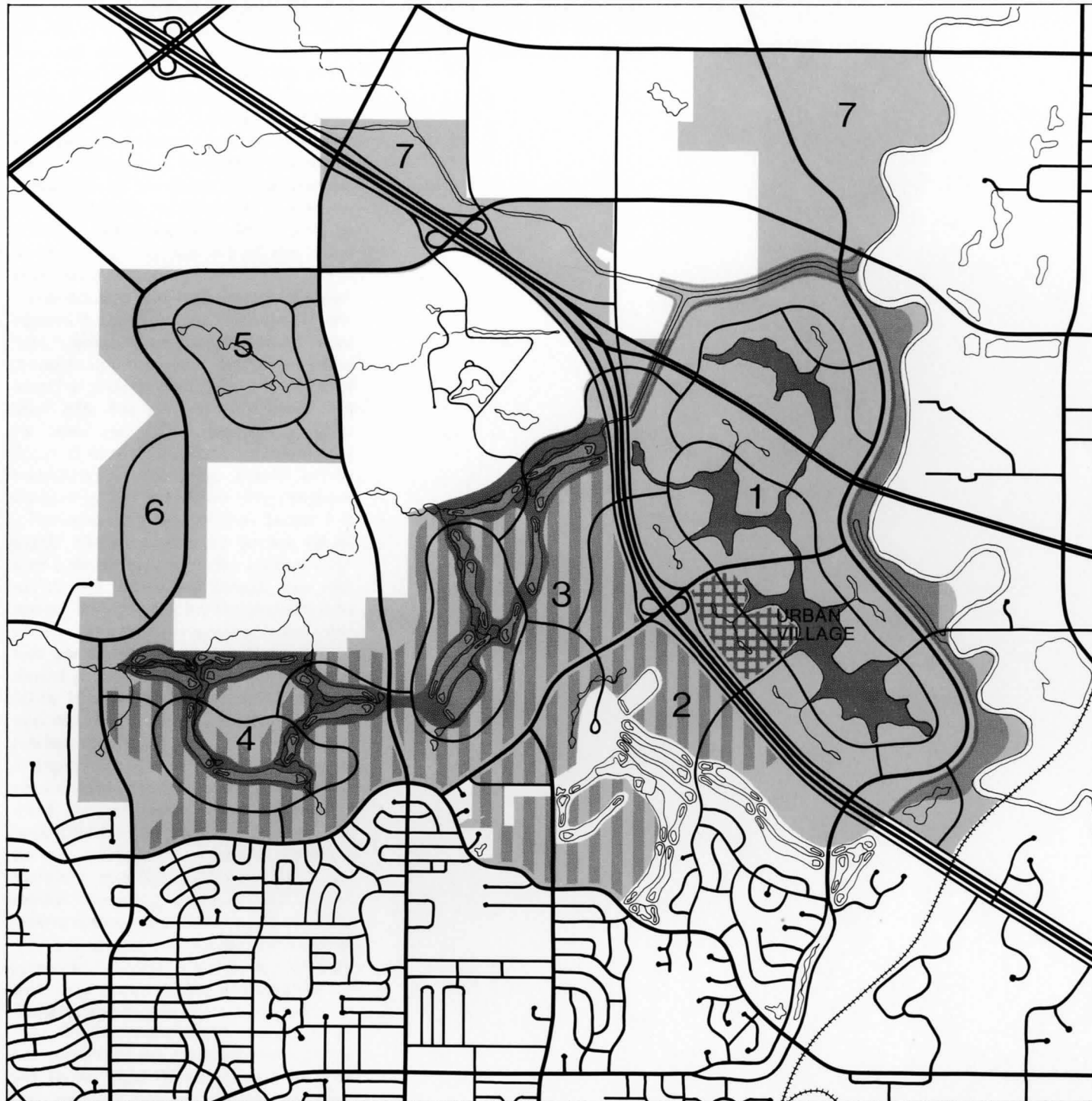
The development plan further projects approximately 2,600 dwelling units in the urban villages of East Sector 1, suggesting an ultimate resident population there of approximately 6,000. Residential development will probably average 35 du/acre.

An additional 500 dwelling units in Sector 6, with a resident population there of around 1,500, suggest a total resident population for all Sectors, 1 through 6, of 33,500 in 11,700 dwelling units.

Non-residential development, primarily for the full range of commercial use, predominates around the lake and along the freeway of East Sector 1. Some 435 acres in this Sector are planned for these uses, with significant variation anticipated in the size of individual developments.

Some mixed commercial use is also proposed for each of the four suburban villages, but greatest in Sectors 2 and 3 where freeway frontage is considerable. The rolling terrain and more suburban character of these villages offer a contrasting choice for investors seeking commercial development in Las Colinas.

Density of commercial development for the urban villages will undoubtedly vary, with highest density hopefully in the urban villages adjoining O'Connor Road. Here the plan envisions the possibility of ultimately achieving a truly urban environment, complete with fully structured parking, interlocking levels and a range and diversity of facilities and services only attainable through such intense development.



Development Strategy

Basic to the plan is the intention of Las Colinas Corporation to retail all land in the Las Colinas acreage. Sales will range from individual lots to parcels of greatly varying size and will not preclude Las Colinas Corporation from, in effect, selling the land to itself for its own developmental purposes. Such development could, in fact, be a significant element in the marketing program.

As a planning objective, Las Colinas Corporation has proposed to start its marketing program in 1973. It is generally agreed that this marketing program should be initiated coincident with, or at least mindful of, the opening of the Dallas-Ft. Worth Regional Airport; that it should begin with sufficient impact to imprint 'Las Colinas' on the public's mind; and that it should start with more than just residential development.

Many of the proposed construction projects are scheduled to be undertaken at the very onset of development. These include all major roads through the acreage, the 18-hole golf course, and all major flood control measures, including formation of the lake. Flood-control development will be incorporated into a municipal utility district encompassing all of East Sector 1 and extending some distance up Cottonwood Creek. A continuous landscaping program is to be initiated immediately, to thin and extend the natural landscape.

Marketing will probably proceed simultaneously in Southeast Sector 2 and Southwest Sector 4, as natural extensions of previous adjoining developments of Las Colinas Corporation. At essentially the same time, marketing of Southcentral Sector 3 will be undertaken. In the case of Southeast Sector 2 and Southcentral Sector 3, this schedule will permit early marketing of some land adjacent to John W. Carpenter Freeway.

It is generally agreed, however, that development in the lake area is essential

for an initial impact to establish Las Colinas as a community of unique identity and quality. To achieve this goal, early development of at least one urban village is proposed, probably at the intersection of O'Connor Road and Carpenter Freeway. The plan envisions this first urban village as a complete module, a microcosm of the larger future development, reflecting its potentials in totality. A major, quality hotel would certainly be conducive to any kick-off of the initial urban development.

Warehousing and light industrial development is not a use that best supports the basic objectives of Las Colinas, nor does it realize optimum land use. On the other hand, an area in East Sector 1, north of Spur 348, has been initially designated for such use, as has an area in West Sector 6 directly adjacent to the airport boundaries. These areas should aid in supporting the early marketing program.

The urbanized area of East Sector 1 is highly likely to generate greater values over a longer time than the proposed 10- to 15-year marketing period. For this reason, and anticipating the ultimate possibility of a truly urbanized center, certain parcels in the heart of this Sector should probably be held longer than the 10 to 15 years. In this manner, appreciation may be captured as the development reaches maturity.

Regardless of whether the village squares lead or follow residential development, they can offer one of the greatest opportunities for projecting the Las Colinas identity. Their design concept is therefore singularly important to a successful marketing program and should receive special attention.

It is vital that the 'village structure' be preserved, despite innumerable changes that may occur during the specifics of planning and further market analyses.

As flexible responses to changing market conditions are essential, there can as yet be no rigid development plan. Any such response, however, must be carefully

considered in its total context, and measured against the broadest objectives set forth in the master plan.

From the outset, ERNEST J. KUMP ASSOCIATES has been ably assisted by consultants and counselors whose participation in the planning for Las Colinas is gratefully acknowledged: ROBERT N. ROYSTON, Royston, Hanamoto, Beck & Abey, San Francisco / GEORGE M. PARKER, President, Forrest and Cotton, Inc., Dallas / HUBERT D. ELLER, Vice President (Ret.), Equitable Life Assurance Company, San Francisco / SIDNEY E. BOWERS, Phillips, Proctor & Bowers, Dallas / ROBERT S. CURTISS, Chairman of the Board, Ely-Cruikshank Co., Inc., New York / GERSON BAKAR, Gerson Bakar & Associates, San Francisco / ALF E. BRANDIN, Senior Vice President, Utah International, Inc., San Francisco / GUSTAVE E. J. JAMART, DeLeuw, Cather & Co., San Francisco / MAURICE A. GARBELL, Maurice A. Garbell, Inc., San Francisco.

JAMES C. DOWNS, JR., Chairman of the Board, Real Estate Research Corporation, Chicago, has provided continuing consultation to the Las Colinas Corporation, and most important, representatives of the LAS COLINAS CORPORATION have been involved as active participants throughout the entire planning effort.