

VEHICULAR CIRCULATION ANALYSIS

FOR WHITE ROCK LAKE PARK

JULY, 1986

**PLANNING & RESEARCH DIVISION
PARK & RECREATION DEPARTMENT
CITY OF DALLAS, TEXAS**



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PREPARED BY THE
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EXECUTIVE SUMMARY

White Rock Lake Park is one of the larger and most popular urban parks within the Dallas region. The uniquely appealing setting, variety of recreational opportunities and close in location result in heavy use of the park, especially during the weekend but also increasingly throughout the week as well.

The park circulation system, intended primarily for limited automobile use when constructed three quarters of a century ago, now serves a variety of uses for which it was not truly intended. As a multi-functional corridor, it is not only heavily used by recreational and nonrecreational commuter vehicular traffic but also by pedestrians, cyclists and a number of other nonvehicular uses. The park roadway system provides one of the few remaining opportunities within the Dallas region for long, uninterrupted scenic pleasure driving.

Major physical redevelopment and operational/management techniques have been implemented in recent years in an attempt to comfortably accommodate the significant levels of use and eliminate sources of conflict. East Lawther Drive has been redeveloped into four separate park road systems, while active traffic management controls are imposed along West Lawther Drive during peak use periods.

Since these improvements were began in the late 1970's, accidents within the park have declined 64% and crime has decreased more than 54%. However, the park roads still experience a relatively high accident rate compared to the city's street system.

Several major traffic related concerns have been identified within White Rock Lake Park. The high level and variety of uses for which the road system was not intended have caused both user conflict and roadway deterioration. The temporary control devices, while adequate to provide short-term relief, have remained beyond their intended life due to insufficient funding. There are insufficient Park Police to properly secure both circulation system and other undesirable behavior throughout the park. Although not a public street intended for general use, the road system also serves as residential access.

This study presents an evaluation of several alternative circulation concepts which have been proposed by staff and citizens as a means of achieving an adequate circulation and road network for White Rock Lake Park. These concepts include:

- maintenance of the status quo
- intensified management/operational techniques
- temporary one-way northbound system
- permanent one-way system in the normal traffic flow alignment
- permanent one-way system in the reversed alignment
- pedestrian park with transit access and conveyance only
- a maximized loop road system
- a minimized loop road system
- a moderate loop road system
- separate park road system from other circulation functions.

Each of these alternatives have been evaluated against a common criteria for equitable comparison.

Short-term action; intensified current management techniques, and limited physical improvements intended largely to complete the renovation of the current road pattern.

Long-term action; assess the feasibility of a permanent, normally aligned one-way traffic flow pattern along the existing road system throughout White Rock Lake Park for future implementation.

This information which has not yet been reviewed or acted upon by the Dallas Park and Recreation Board, is intended to serve as a base for discussions.

A major limitation of this study has been the lack of a consensus on a comprehensive development plan and management program for White Rock Lake Park. Consequently this circulation analysis, while sensitive to the broader relationship necessary for truly effective planning and management of the park, addresses only the vehicular circulation system independently of the other systems within the park.

INTRODUCTION

BACKGROUND

White Rock Lake Park has been both a major urban shaper and recreational feature within the City of Dallas since its completion as a water supply reservoir in 1911. In 1930, the Dallas Park Board assumed management of the lake and continues to hold the ultimate decision-making authority for its development and administration. Although the lake no longer serves a water supply function, it is now increasingly important for flood control purposes. The park is also the primary element within the extensive White Rock Creek Greenbelt open space and park system, as well as being one of the city's major recreational destination parks.

Motor vehicular circulation has always been an important aspect of the lake's use, development and management. The lake setting provides some of the longest and finest views available in the relatively flat regional landscape of Dallas, and the cool appeal of the wooded waterfront experience continues to draw automobile-oriented sightseers to the park's scenic drives and users to the park's other recreational facilities. The lake also creates a physical barrier to urban development around which the city's street network has grown, and the park roads also now provide a refreshingly casual relief for many urban vehicular commuters.

The circulation system of White Rock Lake Park is a major concern of the Park and Recreation Department, who maintains a program of ongoing research and evaluation of existing conditions and has made significant and regular management and physical adjustments to the road and trail systems in an attempt to maintain an acceptable level of service. One of the major limiting factors in the past has been the lack of sufficient funds to support major redevelopment proposals. Now, however, a potential funding source has been identified which promises a level of funding to support any reasonable alternative improvement through initial identification in the 1985 Bond Program.

PURPOSE AND SCOPE OF THE REPORT

This report is intended to provide a complete overview of the circulation system in response to this potential funding source. It includes a documentation of the conditions related to the circulation system within White Rock Lake Park, an evaluation of a variety of alternative circulation concepts and a statement of recommended improvements necessary to achieve and maintain an effective circulation system within the park. The report addresses the complete existing circulation system within the park, including both East and West Lawther Drives, and the hike and bike trail.

Although vehicular circulation is recognizably a major aspect of the development and management of White Rock Lake Park, it is nevertheless only a part of this very complex facility and should be investigated in context of the whole. Unfortunately there is not currently an up-to-date comprehensive research study and master development plan which addresses the complex interrelated issues that together make up White Rock Lake Park and its problems. Therefore, while this report is sensitive to the broader

relationships necessary for truly effective planning and management of White Rock Lake Park, it addresses only the vehicular circulation system independently of the other systems within the park. The report should be considered as an integral part of any in-depth and comprehensive master plan process which may be undertaken later and/or as part of the 1985 Bond Program.

PHILOSOPHY AND GUIDELINES

Since the fall of 1984, the Park and Recreation Department has been involved in the formulation of a management policy to serve as a guide for all continued development, utilization and maintenance of White Rock Lake Park. While these guidelines have by no means achieved the consensus endorsement of the park's various interest groups, the formulation process has clearly identified and recorded the general philosophy and aspirations of these various interests. These objectives were considered in the evaluation of the several alternative concepts and the formulation of recommendations of this report.

The following are circulation-related management objectives cited by the Park and Recreation Department in the draft of the Management Plan for White Rock Lake Park:

1. "White Rock Lake Park will continue to be open and accessible on a 24-hour basis to all citizens of the Dallas area regardless of the location of residence or physical capability. Its use will not be restricted to any limited user group. Use will only be limited by the capacity of the facilities to support such use and then by reservations on a first come, first served basis."
2. "Full access will be provided to the park and facilities by existing access points and circulation routes, especially to enhance the broadest access to the lakeshore and open spaces. Access to the park and facilities will be limited only by the capacity of the area to safely accommodate users without deterioration of the resource, experience of the users or adjacent properties."
3. "Roadways and parking areas will be upgraded to a more urban standard by surfacing and curbing to enhance capacity, aesthetics and maintenance."
4. "A coordinated system of informational and directional signs as well as interpretative displays will be developed to emphasize to park visitors the character and potential of the resource. These signs and interpretative features will be established at major access points and activity areas within the park and major external streets to provide visitors with good visual orientation and make them more aware of the value of the lake's resources and potential for use, conflicts and hazards associated with inappropriate activities within the park."

A number of varied citizen and user groups interested in White Rock Lake Park and coordinated under the title of the Friendship League of White Rock (F.L.O.W.R.) have provided the following circulation related goal statements:

1. "Access to the park and facilities will be limited to avoid deterioration of the resources, experience of the users or adjacent neighborhoods, and the capacity of the area to accommodate users safely. Special consideration shall be given the feasibility of off-site remote parking areas, including usage of existing parking lots such as area churches, retail centers or the proposed DART station, but excluding usage of existing park land. Consideration shall be given to a shuttle service to operate from such parking areas to key points in the park on high usage days."
2. "Existing roadways and parking areas will be maintained. There is growing concern for park user safety due to hazardous traffic conditions both on and off the roadways. The proportion of paved surface devoted to bicycles and pedestrian uses shall be increased. Options for increased park users' safety to be studied on a site by site basis include:
 - a. widening and realignment of recreational trails with consideration for the preservation of native hardwood trees;
 - b. reducing width of pavement devoted to motorized traffic;
 - c. widening and realignment of street shoulders with consideration for preservation of green spaces."
3. "It is not desirable to use signage located at major external streets to encourage greater usage of the park. The existing level of signage at major external streets should be maintained."
4. "Spoils material of future dredgings shall be removed from White Rock Lake Park and adjacent park land in a timely manner."

RECONNAISSANCE OF EXISTING CONDITIONS

FUNCTIONAL ANALYSIS

Although East and West Lawther Drives are park roads, they are also connected to and an integral part of the city's street system. As a result, nonpark related traffic significantly influences these park roads, and in turn the park traffic influences the city's street system.

A normal urban circulation system serves many functions, and individual streets within the network are classified, developed and managed according to their single, primary function. Street systems within large parks such as White Rock Lake Park should be planned with a similar hierarchy of functions in order to provide separate street facilities to accommodate possibly competing or conflicting functions, such as accessing park facilities, commuting through the park to a destination beyond, or simply driving around the park environment for pleasure.

Unfortunately, both East and West Lawther must serve a variety of functions simultaneously, and this varied purpose traffic competes for the same limited roadway and often causes conflicts. In 1980, East Lawther was redeveloped from a single, continuous multi-functional corridor into four distinct loop road systems, each accommodating a primary park function yet also allowing other functions as well. West Lawther, on the other hand, remains a multi-functional roadway which must serve competing user demands.

Like the major function of local residential streets, both East and West Lawther provide access to recreational facilities scattered throughout the park. These include fishing piers, walking and cycling trails, boat launching ramps, ball fields and diamonds, tennis courts, nature areas, picnic tables, party houses and the museum/theater functions of the cultural center. Each of these activities has differing traffic demands, but all must use the same park road corridors. In addition to these recreational destinations, West Lawther also provides the only public street access to some 24 private residences.

White Rock Lake Park is a regional park, and as such must accommodate facilities and uses to serve the needs of a large population beyond the immediate vicinity of the park. While some users can walk or cycle to the park from adjacent neighborhoods, most must arrive by automobile. No public transit stops within the park and few stop close to its boundaries.

West Lawther also serves, as did East Lawther prior to its redevelopment in 1980, as a public thoroughfare, much like an urban collector street to carry through traffic from residential and work areas to the major arterial streets such as Mockingbird Lane and Garland Road. However much of this through traffic, destined for locations beyond rather than within the park, could also be considered recreational in nature, as most of these commuters choose this scenic route over other more direct or faster city streets for the pleasure of experiencing the attractions of the park. Other users who fit this definition work from their vehicles and use the park road and parking facilities as a base between jobs.

Therefore, unlike any other city street, except perhaps parkways such as Turtle Creek, West and East Lawther also serve as a significant recreational function in themselves. Driving for pleasure remains America's most popular and most often participated in outdoor recreational activity, and the principal use of White Rock Lake Park. Pleasure driving or "going for a drive" or "cruising" is popular with all ages and cultures and a legitimate recreational function. A vast majority of the drivers using the Lawther roadways never stop their vehicles within the park. Similarly, the roadway itself is also heavily used by recreational bicyclists, skaters, and walking or jogging pedestrians. The park road system around White Rock Lake is the only remaining location in Dallas where this recreational driving can be enjoyed.

This multi-functional nature is common to roadways within large urban parks. In response, many cities are attempting to separate these functions onto different roadways. Notably, Swope Park in Kansas City and River Drive in Philadelphia's Fairmont Park provide separate road systems specifically designed to attract and accommodate through, nonpark traffic from through recreational and local destination recreational traffic. The fifteen mile road system within San Francisco's 1,013 acre Golden Gate Park, exemplifies a hierarchy of fully separated circulated patterns ranging from the 95 feet wide divided Kennedy, arterial, to the 18 feet wide Chain of Lakes Drive, local access road, and the 8 to 10 feet wide hike and bike trail.

Functional Issues

1. Driving for pleasure is an important recreational function unique to the Lawther roadway systems and should be preserved if possible.
2. As a regional park drawing users from throughout the city, White Rock Lake Park must continue to accommodate automobile access and circulation.
3. Roadway segments which accommodate varied and often conflicting functions should be separated where possible.

DESIGN ANALYSIS

When first built within a rural setting more than three quarters of a century ago, the road system around White Rock Lake served only as access to the lake and its private cabins and later to the few scattered recreation facilities as they were provided. The road network remained nearly unchanged but adequate to fulfill this limited function for decades. Now the lake and park area is completely surrounded by urbanized land uses, many attracted to the location by the lake itself. East and West Lawther Drives were not intended or built to accommodate the variety and level of use now required of them within this urban setting and as links of the urban street system.

East and West Lawther are two lane, asphalt roadways from 20 to 22 feet wide. Except for isolated areas, notably T. P. Hill and the Batnhouse Cultural Center, no curbs are provided. A two to four feet wide shoulder is normal throughout the length of the roadway, and the road right-of-way is normally separated from the adjoining park land by a line of short wood or concrete

posts or drainage ditches. Curves are not designed for urban speeds and bridges are barely wide enough to accommodate two traffic lanes. The park road system has never completely encircled the lake, and park traffic desiring to do so must use area city streets including major thoroughfares such as Mockingbird and Garland Road and minor residential streets such as Fisher Road and Poppy Drive. Until the mid-1970's, head-in parking between the lake and road was allowed indiscriminately along both East and West Lawther and the landscape still has not fully recovered from the deterioration such traffic caused. The park still reflects a rustic image rather than an urban park appearance.

In the mid 1970's, several portions of West Lawther Drive were redesigned in order to better separate the roadway from the parking lots and activity areas. The most significant changes were made at T. P. Hill and Lilly Pad Bay parking areas, and several new offstreet parking lots were created along this 3.9 mile linear roadway.

The design of East Lawther Drive was changed in 1980 to convert the previously continuous 4.5 mile linear roadway into four separate loop road systems. Each of these loop systems is connected to the external city streets and serves different recreational facilities within the park. The longest of these, the 1.5 mile Winfrey Point loop still accommodates the historic scenic drive, fishing and other passive recreation functions, as well as the Winfrey Point party house, ball diamonds and exercise/jogging trail. Slightly shorter is the series of cul-de-sacs which connect the Dreyfuss party house, Stone Tables picnic complex, and the Sunset Bay Nature Center. The old Bathhouse Cultural Center is provided a single function access road. The northernmost loop off of Mockingbird provides access to the sailing clubs as well as passive picnic areas and the Big Thicket party house.

Other cities have had to impose similar design techniques to protect the recreational character of road systems within large urban parks. Ft. Worth made the Trinity Park Drive along the Trinity River one-way, Austin temporarily barricades access to internal park roads during peak weekend use in Zilker Park, Houston has redeveloped the roads in Herman Park to terminate in parking lots and eliminate through traffic, and Atlanta has completely closed Piedmont Park to all motor vehicular traffic except for special event access, as does Denver on a temporary basis in its Sloan Lake Park. In Golden Gate Park in San Francisco, a variety of circulation improvements have been implemented, including permanent closure and removal of some internal roadways, permanent conversion of some two-way roads to one-way traffic flow and the use of temporary closures and one-way flow on Saturday and Sunday peaks, installed new traffic control signs and lights and fully separated the equestrian, cycling and pedestrian paths from each other and the vehicular systems. A transit shuttle bus system was tested but found infeasible and unacceptable for the regional Golden Gate Park in San Francisco.

Design Issues

1. The rural road design is inadequate for the urban levels of use the road now gets.

2. Criteria for modern urban street designs are more compatible with the current level of use of the park roads, and can be designed to aesthetically complement the recreation area it serves.
3. In many areas there is insufficient right-of-way and park land to adequately accommodate proper road design.

CAPACITY ANALYSIS

Every physical facility exhibits a carrying capacity or acceptable level of service, within which the facility operates most efficiently and beyond which failure may occur. For a roadway, capacity is defined as the maximum number of vehicles which can be accommodated over a given section during a given period of time under prevailing roadway and traffic conditions and still maintain a given acceptable level of service. Prevailing roadway conditions which affect capacity include such factors as street and lane width, surface material, curves and grades; while capacity related traffic conditions include the proportion of larger trucks and buses, onstreet parking, the number of turning movements from and into the lanes, speed limit, traffic control devices and other interruptions to smooth traffic flow.

Capacity is, therefore, a somewhat subjective variable rather than a precise calculation and largely dependent on the anticipated level of service desired for the roadway to fulfill its function. Local residential streets have a capacity of about 2,000 vehicles per day. But this is in order to maintain at capacity a level of service which provides free unobstructed traffic flow and allows full choice of speed and lanes without slowing or restrictions. Although often narrower, rural roadways have a capacity of about 7,000 vehicles daily, because traffic expects to move more slowly yet there are normally fewer interruptions such as intersections, onstreet parking and truck traffic.

At their currently posted speeds, roadway conditions and vehicular characteristics, the two-way segments of both West and East Lawther are assumed to have a safe capacity of approximately 5,000 vehicles per day. This higher estimate of capacity than used in most area residential streets is based on the nature of the recreational experience which generally encourages slower speeds, the absence of large trucks and buses, the reduced number of traffic interruptions such as intersections and driveways which require turning movements, and the restriction of parking within the roadway. The narrowness of the roadway and bridges, several sharp turns and a high level of pedestrian use suggest that the capacity should be lower than the 7,000 vehicles per day assumed for rural roadways.

Most of the White Rock Lake Park road system, both West and East Lawther Drives, are currently at or exceed this suggested capacity of 5,000 vehicles per day most of the time. Actual recent traffic counts during the weekday on West Lawther Drive report 5,500 cars per day. Prior to the redevelopment of East Lawther Drive in 1980 weekday counts along this roadway averaged over 6,000 per 24-hour period, and current observation suggests that the traffic volumes along this entire roadway are only slightly lower today.

By comparison, residential Williamson Road which intersects West Lawtner Drive currently carries approximately 3,700 cars per day and the four-lane divided collector Audelia reports approximately 7,700 cars daily, while the six lane divided Garland Road carries 37,000 cars daily and Northwest Highway along its segment through White Rock Lake Park reports approximately 45,000 cars daily.

However, Shorecrest Drive, which borders Bachman Lake Park on the south and carries both recreational and commuter traffic as well as through traffic between Harry Hines Blvd. and Lemmon Avenue, reports current volumes of 11,000 cars within an average 24-hour weekday. Trinity Park Drive in Ft. Worth recorded a weekday traffic volume of about 7,000 before the one-way system was implemented which has reduced it to 4,000 cars daily. In San Francisco's Golden Gate Park, weekday traffic volumes range from 12,000 to 38,000 vehicles on local park access roads and reach 60,000 vehicles per weekday on through city streets which run through the linear park. These three recreational examples are very similar to the West Lawther Drive context.

Of course, as a recreational facility, the peak use periods for the Lawtner Road systems are weekends and holidays. Highest traffic volumes are experienced during the moderate weather of the spring months, especially between March and May. Before its redevelopment, actual traffic counts on East Lawtner reached as high as 35,000 cars on Saturdays and Sundays during the spring peak period, and ranged between 10,000 and 20,000 vehicles per weekend day throughout the remaining seven months of the year. It is estimated that vehicular counts during the spring Sunday peak may currently reach 20,000 to 30,000 cars along West Lawtner and 7,000 to 10,000 vehicles within the Big Thicket/Sailing Club loop of East Lawther. In fact, traffic volumes along these stretches reach the saturation level and force roadway closures until congestion has declined for two to four hours each on about three to four Sunday afternoons during the spring, or about 12 to 16 hours per year.

Capacity Issues

1. Most roadways within the White Rock circulation system are currently at or exceed assigned capacities and on some occasions become totally inoperative during limited peak use periods in the spring.
2. Traffic volumes consistently above the assigned capacity levels deteriorate the recreational experience of users and the resource as well as limit emergency response.
3. The redevelopment of East Lawther appears to have reduced the differential between capacity and volume, and allow better management of peak traffic.
4. The management systems implemented on West Lawther on Saturday and Sunday peak times effectively double its capacity and appear to provide adequate control measures during a vast majority of time.
5. Traffic volumes in the Dallas area are increasing at a rate of approximately 3% annually, indicating that the traffic along the Lawtner Drive system may be expected to grow rather than decline.

PARKING ANALYSIS

Parking facilities provide terminal services for access to facilities served by the roadway and are an integral part of internal circulation systems such as that within White Rock Lake Park. Every recreational activity has specific and differing parking requirements which together dictate the overall parking demand for the park complex.

Of course, driving for pleasure or cruising require no parking facilities, and this is a primary use of the White Rock road systems. Sightseeing, closely related to pleasure driving, requires parking facilities close to the roadway suitable for stops of short duration where the occupant may not even leave the car. Parking facilities to serve picnicking and fishing must be relatively close to the use facilities as it may be difficult to transport equipment or the vehicle may even be used as an integral part of the activity for storage, music or shelter from the weather. Likewise, recreational cyclists transporting bicycles to the park by automobile, require parking facilities near the trail even though the vehicle does not remain a part of that recreational activity. Walking and jogging also require the unrelated storage of vehicles reasonably close to the activity but for undeterminable periods of time. Other recreational activities such as softball and soccer, reflect highly determinable numbers of participants and lengths of stay, and related parking requirements are easily calculated.

Currently there are a total of 1,425 offstreet parking spaces within White Rock Lake Park south of Mockingbird Lane. These offstreet parking spaces are generally well distributed throughout the park and conveniently located in conjunction to activity areas. None of these spaces are metered, reserved for special use or otherwise restricted. All onstreet parking has been eliminated throughout the park both by design features such as concrete or wood posts along the shoulders and signed regulations.

The 338 spaces along West Lawther are largely centered at the major activity areas including the concession area at T. P. Hill and the boat launching ramp and fishing pier at Lilly Pad Bay, and otherwise distributed at approximately one-half mile intervals along the roadway. These lots are all paved and designed so that turning movements for access and egress are not a major interruption to through traffic along West Lawther.

The majority of the total parking spaces, 1,087 or 76%, are distributed along the East Lawther loop systems. These parking lots are largely unpaved and provide no clear lane delienation and are therefore not normally used to their effective capacity. The only paved parking areas on the east side are the large lot at the Bathhouse Cultural Center which contains approximately 180 undelienated parking spaces and the well organized and striped 66 space lot at Winfrey Point. The parking lots along the Big Thicket/Sailing Club loop and the Dreyfuss Club/Sunset Bay loop are well separated from the roadway so that turning maneuvers do not interrupt through traffic and are normally bordered by posts. Many of the parking areas along the Winfrey Point loop are head-in parking lots containing 4 to 10 cars each and turning movements for access and egress of these lots must be performed within the roadway causing interruption of traffic flows.

An inventory of the parking supplies at White Rock Lake Park indicates that the spaces are used differently at various times of the day and week. Daytime occupancy rates during the weekday average approximately 15% and increase to 25% during the afternoon commuter rush hour and early evening recreational periods. On Saturday and Sunday, occupancy levels increase to an overall average of 60%, and reach 100% of capacity for 2 to 4 hours each on 4 to 6 Sundays of the spring peak use period.

At these times when the offstreet parking lots within the park are at or near capacity, park users often park along neighboring residential side streets and walk into the park, especially along West Lawther Drive. Parking on neighborhood streets to use parks is common throughout Dallas and other cities. Spillover parking from Kiest Park peak use times uses neighboring residential streets. Denver removed all parking within its central City Park and Sloan Lake Park forcing use of neighboring streets for parking. Even the 1,000 acre Golden Gate Park in San Francisco reports the use of adjoining residential streets for spillover peak period parking.

The highest average use of parking lots along East Lawther are of those within the Big Thicket/Sailing Club loop, where weekend utilization is regularly 60% and attains 100% of capacity or saturation on 2 to 3 Sunday afternoons per year. The smaller lots close to Winfrey Point and the Sunset Bay Nature Center also reflect continued high use due to their proximity to fishing piers, jogging and exercise trails, duck feeding and picnic areas. The head-in lots along the Winfrey Point loop are used at approximately 10% of capacity during the weekdays, largely by fishermen, picnickers and other passive recreators.

The parking lots at White Rock Lake Park have often been identified as the centers of unacceptable and obnoxious behavior, often not directly related to other recreational activities or opportunities within the park. Loud music, drinking and related antisocial behavior has most recently been centered around two or three lots on the north side of the lake closest to Mockingbird Lane on both the east and west sides. In response to this undesirable activity, a parking curfew has been imposed at most of the lots along West Lawther Drive, and gates installed which eliminate the use of the parking lots between 11 p.m. and 7 a.m seven nights a week. When the curfew was first initiated, a total of 92 onstreet parallel parking spaces were removed along the shoulder of West Lawther Drive and replaced by the 50 car offstreet lot southwest of the Mockingbird bridge.

Actually this evolutionary upgrading of parking facilities has been occurring for a number of years as prior to the mid 1970's parking was allowed indiscriminately throughout the park until the road systems were better delineated with shoulder postings and offstreet parking lots provided. The continuing misuse of the Bathhouse parking lot for obnoxious behavior was a primary factor in the redevelopment of East Lawther Drive in 1980. Currently, such undesirable activity is still reported especially during late evening hours in the Big Thicket area of northeast Lawther and at the first parking lot at West Lawther and Mockingbird Lane.

Although this behavior may have been unpopular with other users of the park and neighboring residents, it was not illegal. In recent years ordinances that restrict the use of alcohol from some areas of the park and limit noise amplification have been instituted although enforcement is difficult within the park setting. Other cities, in fact most Dallas area suburbs, currently restrict all use of alcohol in parks and some of these residents use White Rock and other Dallas parks where drinking is allowed.

Determining the demand for parking spaces in a complex such as White Rock Lake Park is difficult as each type of activity reflects different parking demands and even varies considerably from time to time. The Dallas Development Code has no parking requirements for public park areas. However, commonly accepted practice suggests one offstreet parking space for every acre of park land. Utilizing this standard, 994 parking spaces are theoretically required to support White Rock Lake Park, with approximately 30% allocated to the West Lawther side and the remaining 70% to East Lawther. Current conditions closely approximate and in fact exceed these suggested standards.

Parking Issues

1. Parking facilities along West Lawther are generally well located and developed and are adequate to support park use except at the limited peak use times when the roadway is also at capacity.
2. A majority of the parking along East Lawther is undeveloped and inadequate to support heavy levels of use.
3. Parking lots can attract the congregation of undesirable activity which may have a negative impact on other park areas and neighboring properties, and this activity should be controlled through design and management measures.

ACCIDENT AND CRIME ANALYSIS

A majority of all traffic accidents are directly attributable to driver error, such as excessive speed, following too close, failure to yield the right-of-way or other violations of operation regulations, rather than inadequate road conditions or traffic control devices. However, accidents are one of the major indicators used to identify problems and failures of the circulation system.

Between 1978 and 1985 traffic related accidents within White Rock Lake Park decreased 64% from 119 to 43 within the year. In 1978, East Lawther accounted for 72% of the total accidents along the park circulation system, while this relationship had almost completely reversed by 1985 when West Lawther recorded 61% or 26 of the 43 total accidents. Accidents actually decreased along both roadways, but the East Lawther system decreased 80% while West Lawther decreased 21%. In 1978, 54% of the total accidents occurred during the two day weekends, but this proportion was reduced to 42% by 1985 reflecting the expanding use of the park during the work week as well as better control of weekend traffic through the physical controls and enforcement. During this time, West Lawther reported an increase in the ratio of weekend accidents to

the whole, largely because of a slight increase of Saturday accidents, from 5 to 7. Most accidents continued to occur between 3 o'clock and 7 o'clock p.m., both on weekdays and weekends, which corresponds to the time when the park and roadway accommodates the greatest variety of functions and highest traffic volume. Speed was a contributing factor in only 12% of the total accidents in 1978 but this cause had increased to 44% by 1985 or 19 of the 43 total. Drinking was noted as the primary cause of only 5 accidents in 1978 and 7 during the 12 month 1985 period and most of the alcohol related accidents occurred on East Lawther during both years. Injury accidents increased along West Lawther, from 18% to 58% of the year's accidents, while injury accidents decreased by a significant 31% along East Lawther during the recording periods.

On both East and West Lawther, an average of 60% of all accidents result from hitting some fixed object rather than another moving vehicle, reflecting the significance of driver error as a causal factor. Some accidents may, however, be in part caused by inadequate road conditions for the volumes of traffic they must accommodate. In 1978 a majority of the accidents along East Lawther occurred in the vicinity of the Bathhouse Cultural Center parking lot, but these were largely corrected by the redevelopment of the roadway which reduced significantly the traffic volumes and related conflicts in this area. During 1985, most of the accidents on the east side of the park occurred along the Big Thicket/Sailing Club loop, which is a dangerously long one mile cul-de-sac serving a variety of uses and heavy traffic volumes within a relatively narrow corridor. Funds have not been made available to connect this roadway to Buckner Blvd. as planned, to replace the two-way dead-end cul-de-sac with a one-way circular drive system. However, as part of those funds identified in the 1985 Bond Program, planning will be initiated to design such a connection.

Along West Lawther most accidents now occur at T. P. Hill, where the wider street encourages faster traffic through a major activity area where hills and curves combine to reduce sight distances. In 1978, most of the accidents along West Lawther occurred in the northern areas closest to the Mockingbird Lane entrance readily accessible to regional access by recreators and commuters alike. Now access to the park is better balanced between the several points of entry, and users are apparently more aware of these options.

The accident rate of the park road system within White Rock Lake Park is high when compared to other park roads and city streets within Dallas. Accident rates are calculated by a formula which includes the number of accidents and the traffic volume of the same road segment within a year, in order to provide an equitable comparison of otherwise unequal street systems. In 1985, the accident rate along West Lawther Drive was 12.6 accidents per million vehicles, based on actually observed and justifiable statistics. The apparent 1985 accident rate for the Big Thicket/Sailing Club loop of East Lawther Drive, based on estimated traffic volumes was 16.4 accidents per million vehicles. The 1985 accident rate for Shorecrest Road, which borders Bachman Lake on the south and is most similar to the function and conditions of West Lawther Drive, was 5.7 accidents per million vehicles based on an actually reported 12 accidents. Kiest Park Circle, a one-way park road within Kiest Park and closely comparable to the looping network of East Lawther, had 8 accidents during 1985 for an accident rate of 10.9.

Neighborhood residential streets within the White Rock Lake area heavily used for access to the park reflect even lower accident ratios, including Williamson Road at 7.9 and Lakewood Blvd. at 4.6 accidents per million vehicles. Fisher Road, however, a narrow two-lane road providing direct access to White Rock Lake Park as well as serving significant residential use, reflected an actual justifiable 1985 accident ratio of 29.5 accidents per million vehicles. The average accident rate for two-lane two-way city streets across Texas is currently approximately 3.2 accidents per million vehicles.

By comparison, St. Mary's, the major road through Breckenridge Park in San Antonio, reflects a calculated accident rate of 18.3. Ft. Worth's Trinity Park Drive reports 20 accidents and a rate of 10.9. Within Golden Gate Park in San Francisco, the major park road most like West Lawther, Kennedy Drive, reports 21 accidents annually for a rate of approximately 10 accidents per million vehicles, and the local park service roads most like East Lawther report rates between 5.5 and 14.3.

Although not directly related to the circulation system, crime statistics are often used as an indicator of failure in the management of urban development systems. Between 1978 and 1985, reported crimes within White Rock Lake Park decreased by 54%, from a total of 417 to 192 for the 12-month periods. Approximately 62% of the crimes still occur on the east side of the lake. Nearly half of the total crimes within the park, 48%, occur during the weekend with Sunday alone accounting for 26%. Nearly half, 45%, occur during the two spring months of March and April and only 18% occur during the five month period between October and February. A significant majority of the crimes, 64%, occur during the daylight hours between 8 a.m. and 10 p.m. rather than at night.

The most common types of crime are thefts and robberies which combined amount to 58% of the total, and vandalism which represents an additional 21%. Crimes against persons physically, such as assaults and rapes, represent 12% of the total. The greatest number of crimes reported are against automobiles and their contents.

In comparison, 103 crimes were reported along Shorecrest in Bachman Lake Park during 1985, and 65 crimes reported in the Lakefield Drive area on the north side of Bachman Lake Park, for a total of 168 crimes within this smaller park. Unfortunately, crimes related to alcohol and other drug abuse are not available nor are general comparisons with other parts of Dallas or other cities.

Residents neighboring the park report an apparent wide-spread perception that White Rock Lake Park is unsafe, especially at night. Although all crimes are significant, the record does not substantiate that this is true, as discussions with law enforcement planners appear to indicate that the experiences at White Rock do not differ greatly from other similar areas. Within the last five years, there has been an obvious and significant increase in the use of the park by families, children and unaccompanied women which indicates that the perceived safety hazards are not shared by all Dallas citizens. And, as noted, crime actually significantly declined in recent years. Although any accident or crime is unfortunate and costly, the

available statistics for White Rock Lake Park do not indicate a disproportionate rate or major failure of the existing system.

Accident and Crime Issues

1. The road system within White Rock Lake Park reflects a comparatively high rate of accidents, some of which could be avoided by improvements in the circulation system and enforcement of common operational and management regulations.
2. The perceived high crime rate could be lowered by increased enforcement by an expanded Park Police force during time when the park is more heavily used.
3. The restrictions on drinking and noise have apparently been effective in reducing related accidents and obnoxious behavior.
4. Most accidents and crimes occur during the times when the park is at its greatest use.

NONVEHICULAR CIRCULATION ANALYSIS

Unique pedestrian and other nonvehicular safety problems are associated with the circulation system within White Rock Lake Park. The roadways themselves are used by walkers, joggers, skaters, recreational cyclists, equestrians and a variety of other types of nonvehicular use. In fact, the assigned trail system also uses the roadway in many long stretches of both West and East Lawther, creating the potential for direct conflict.

Because of the routines of their recreational activity and the apparent perceived safety of a protected park environment in which to participate, many pedestrians are apparently unaware of and unprepared for these potential hazards. The redevelopment of East Lawther has attracted a significant increase in pedestrian and cycling activity along this corridor. The improvements have also resulted in a reduction of vehicular-pedestrian/cyclists accidents since 1980. However, at least 20% of the accidents reported along West Lawther Drive during 1985 involved pedestrians or cyclists. These recreational activities are increasing and with them the potential for conflicts and hazards.

The bridges at Mockingbird and Garland Road pose the greatest hazards for pedestrian and cyclist related accidents. Although not actually within the park, the lake cannot be completely encircled without the use of these bridges, and the pedestrian route is narrow and unprotected from the motorized traffic lanes. Alternative design concepts to separate pedestrians and cyclists from motor vehicles at these locations was funded in the 1985 bond program and this planning is currently underway.

The hike and bike trail system at White Rock Lake Park is intended as a multiple use corridor, and user conflicts arise from inappropriate uses for which it was not intended. More active cyclists have suggested widening the existing hike and bike trail in order to accommodate higher speeds and greater

volumes of use. However, widening or providing other accommodations which further encourage inappropriate levels of use beyond the passive recreational intentions are not considered appropriate. Plans are currently being completed for limited resurfacing and isolated renovation of the trail in order to eliminate some potential hazardous areas. Well protected lane dividers have already been provided along East Lawther to safely separate joggers and cyclists from the one-way motorized vehicular traffic.

Sailing is another major nonvehicular use of White Rock Lake Park which impacts greatly on the circulation system. The three boat clubs located at the lake are generally within the same vicinity along the north end of East Lawther so that the associated traffic uses the same roadway at approximately the same times. However, the major launching ramp on the west side at Lilly Pad Bay shares the access roadways, parking, pier and even ramp with all of the nonboating uses in this area, causing major conflicts. In the absence of sufficient ramps along the shoreline, many boaters launch at other locations where parking lots are adjacent to the shoreline, introducing the interruptions of trailers to roadways and parking lots throughout the park.

Nonvehicular Issues

1. There is a need to fully separate vehicular from nonvehicular circulation patterns throughout White Rock Lake Park.
2. The hazardous potential for pedestrian/cyclists and vehicular conflict along the Mockingbird and Garland bridges should be eliminated as soon as possible.
3. DART should be encouraged to provide better nonvehicular pedestrian and bicycle access and utilization in connection with White Rock Lake Park.
4. Within White Rock Lake Park there is a significant difference between high-intensity active cycling and low-intensity or passive recreational cycling, and this difference should be more clearly accommodated within a coordinated park circulation system.

OPERATIONAL ANALYSIS

Both East and West Lawther Drives are internal park roadways rather than dedicated city streets and are therefore completely under the operation and maintenance control of the Dallas Park and Recreation Department.

Properly designed circulation systems operating as anticipated should require little conscious effort by users or active management operations by the public sector. Both design and operational measures should be passive in nature and provide protection automatically.

The multitude of intervening operational requirements have resulted in a significant number of signs along the White Rock Park circulation system. These signs include informational, directional and warning devices related to a variety of subjects. There is no standardization of the sign configuration, message or placement, and the signs are often confusing and even conflicting

rather than providing assistance. There are approximately 150 individual signs along West Lawther Drive alone. When such signs are selected and used indiscriminately they tend to lessen the users' respect for such controls that are warranted.

Speed is currently a contributing factor in 40% of the vehicular accidents on the Lawther Drive system. Excess speed by active cyclists is also a frequent cause of accidents along the hike and bike trail. Few sections of the roadway are capable of supporting the 25 miles per hour limit currently posted and yet even this limit is not enforced.

The improvements to the White Rock Lake Park circulation network have largely been provided through individual piece-meal actions rather than guided by an overall coordinated master plan or management program. Even the major road improvements were performed with little recognition of the future management philosophy or development pattern of the park. Road improvements designed and installed as temporary remain as permanent and often deteriorate or become obsolete as levels of use increase. The design of neither the hike and bike trail or the roadway system adequately anticipated the varied types and level of use which they must serve today or are likely to serve in the future.

Several of the control and management measures are not currently fully enforced due to an inadequate number of Park Police, their schedule and equipment. Especially during peak use periods on weekends, when Park Police must manage the traffic control access points, and late at night when Park Police are off duty, various management regulations go unenforced. Speeding, off-road parking, drinking and noise amplification, in direct violation of laws already in effect and posted regulations, are widespread and create an image of poor operational control, thereby often encouraging other types of deviant behavior.

A comprehensive management plan has been drafted to serve as a guide for all continued development, utilization and maintenance of White Rock Lake Park. In addition, consultants have been retained to produce a master development plan intended to identify the needs and best locations for future facilities within the park. However, neither of these important policy statements are currently available.

Operational Issues

1. Current operational measures utilized along East Lawther Drive appear adequate to manage the current level of use, but permanent physical improvements to support these controls method should be completed as rapidly as possible, especially the roadway improvements and circulation control devices.
2. The current temporary management control program utilized during peak use periods along West Lawther Drive should be regularly reevaluated, but appears adequate for use within the foreseeable future.
3. The 25 mile per hour speed limit should be reevaluated for potential lowering to a possible 15 to 20 miles per hour.

4. A coordinated system of signs and interpretive features should be established throughout the park.
5. A consensus and comprehensive management plan, including detailed master site planning recommendations should be adopted and utilized to guide the long range operational decisions related to the park.

ALTERNATIVE CIRCULATION CONCEPTS

This chapter of the report briefly summarizes several proposals which have been suggested for the redevelopment of the circulation system of White Rock Lake Park. These concepts have been generated by citizens and staff alike, and each is supported by various philosophies and goals not always shared by other interested parties or proposals.

Every attempt has been made here to define and present each proposal as a unilateral, free standing concept. Each concept presents a proposed treatment for the entire White Rock Lake Park system, both East and West Lawther Drives. Of course, individual aspects or subunits of any overall concept may also be considered for inclusion within any other concept, even formulating new proposals not discussed here. This should not be considered an exhaustive list of possibilities, but is thought to include all serious suggestions presented in this regard. Each concept is separately illustrated in maps included within the appendix of this report.

It should be noted also that these concepts address only the circulation system independently of other development, use or management components of the park. In the absence of a comprehensive master development plan which provides a balanced look at the various influences on the park, this summary addresses the circulation component only.

CONCEPT A: MAINTAIN THE STATUS QUO

This concept suggests maintaining the existing physical street pattern, allowing through traffic the entire length of West Lawther with all side streets remaining open during the weekdays. Parking will remain restricted to existing offstreet lots. Current user restrictions such as parking curfews, noise and alcohol prohibitions as well as police security and enforcement will continue at the current level. Maintenance will remain at the current level. Control of traffic during the spring peak periods will be accomplished with temporary measures currently used including redirection of traffic flow into the southbound one-way system and use of side street closures to restrict access between noon and 6 p.m. from mid February until mid July. Temporary signs and barricades will continue to be used. The existing loop pattern along East Lawther will remain as is with no new development.

Advantages of Concept A include the following:

- Already in place
- Closest to current image of White Rock Lake Park
- No additional capital cost to implement
- No increased maintenance costs
- Adequately serves abutting residents
- Maintains the historic use of West Lawther as the primary parkway and recreational drive in Dallas
- Maintains widest user choice of park facilities
- Supports greatest interaction of uses and users
- Already tested and found effective.

Disadvantages of Concept A include:

- Perceived by some area residents as ineffective
- Lacks consistency and dependability of circulation pattern and park access
- Fails to address the frustrations caused by conflicting users within the same corridor
- Gradually declining level of service as traffic volumes increase
- Very labor intensive requiring high operation/maintenance cost
- Limits security and control during peak-use periods
- Fails to complete the East Lawther loop system to earlier anticipated quality.

CONCEPT B: INTENSIFIED MANAGEMENT/OPERATIONS

This concept suggests maintaining the existing circulation pattern for both West and East Lawther. Increased Park Police will be assigned to the park for security and enforcement. A total ban on alcohol will be adopted and strictly enforced. Parking areas along East Lawther Drive will be paved and properly striped and the roadway of both West and East Lawther upgraded to urban quality and properly maintained. The temporary street closure barricades will be replaced with more permanent and substantial units. The new roadway connecting the Big Thicket/Sailing Club loop to Buckner Blvd. will be completed and this system perhaps made one-way southbound at least during weekend peak use periods. A coordinated and consistent sign program will be provided throughout the park and along external access streets. Ultimately, the one-way southbound operation of West Lawther could be extended throughout the full 48-hour weekend and year-round for consistency. An adequate engineering analysis should be performed to determine the adequacy of the current 25 miles per hour speed limit and the need and feasibility of lowering it. The speed found most feasible should be adopted and enforced. Likewise, the feasibility of using a shuttlebus system as a supplement to private automobile access during peak weekends and special events should be studied.

A sub-option to Concept B includes maintaining the existing physical street pattern, allowing through traffic the entire length of West Lawther with all side streets remaining open during weekdays only. Unlike the aforementioned option of control accessing being placed upon traffic during the spring peak periods, the alternative is to close all side street access on weekends from mid February until mid July, redirection of traffic flow into the southbound one-way system, and tighter control being placed on access to West Lawther from Mockingbird based upon the number of available parking spaces provided along West Lawther. Once all existing 338 parking spaces along West Lawther are full, no additional vehicular access will be permitted until spaces become vacant. Access to private residential property along West Lawther would be permitted at all times with a proper identification sticker on the car or some other type of identification of the residents, and/or their prior identified guests. This option in some form can be used in combination with other concepts that follow.

Advantages of Concept B include:

- Largely already in place
- Closest to current image of White Rock Lake Park
- Closest to current operational techniques, requiring little or no additional education of public/users
- Low to moderate capital costs to implement
- Shortest time frame to implement
- Development can be phased for minimal disruption
- Maintains historic use of West Lawther as the primary parkway and recreational drive in Dallas
- Adequately serves abutting residents
- Maintains the widest user choice of park facilities
- Supports greatest interaction of uses and users
- Already tested and found effective.
- Reduces vehicular access to parking capacity under the option.

Disadvantages of Concept B include:

- Perceived by some area residents as ineffective
- Lacks consistency and dependability of circulation pattern and park access, unless one-way is extended to full weekend
- Very supervision and labor intensive, requiring increases in operation and maintenance costs
- Some adjacent residents may view this as an intrusion to their specific neighborhood- Limits security and control during peak use periods
- Fails to address frustrations caused by conflicting users within the same corridor
- Gradually declining level of service as traffic volumes increase.
- Option may cause neighborhood objections.
- Option requires significantly increased management and related costs during peak period operations.

CONCEPT C: NORTHBOUND TEMPORARY ONE-WAY

This concept merely reverses the one-way direction of traffic flow during peak hours on West Lawther, and is otherwise similar to either Concepts A or B. The current street pattern will remain as is with no additional roadways or parking provided, except for the possible completion of the Big Thicket/Sailing Club extension to Buckner and paving the East Lawther lots as outlined in Concept B. The upgrading of barricade controls and signs may be considered as discussed in Concept B. Reorientation of only peak time access away from regional thoroughfare of Mockingbird will reduce compulsive use.

Advantages of Concept C include:

- Traffic flow better coordinated with existing alignment of side streets, providing smoother traffic flow
- Closest to current image of White Rock Lake Park
- Best serves abutting residents, especially those in Wendy Lane area
- No capital costs to implement
- Maintains the historic use of West Lawther as the primary parkway and recreational drive in Dallas

- Maintains widest user choice for park facilities
- Supports greatest interaction of uses and users
- Already tested and found effective to some degree.

Disadvantages of Concept C include:

- Mockingbird Lane allows better access and backup stacking than Williamson Road
- Routes heavier park access traffic through neighborhood residential streets during peak use periods
- Requires reeducation and reorientation of the user public and abutting residents
- Fails to address the frustration caused by conflicting users within the same corridor
- Perceived by some area residents as ineffective
- Lacks consistency and dependability of circulation pattern and park access
- Very supervision and labor intensive, requiring ongoing operation and maintenance costs, increased if improvements of Concept B are applied
- Limits security and control throughout the park especially during peak use times.
- Some adjacent residents may view this as an intrusion to their specific neighborhood.

CONCEPT D: PERMANENT ONE-WAY/NORMAL ALIGNMENT

This concept suggests the operation of a permanent one-way traffic flow pattern along the full length of both East and West Lawther Drives. West Lawther will be restricted to southbound one-way traffic between Mockingbird Lane and Williamson Road, with all side streets left open for full access and egress. East Lawther will be made one-way northbound between the Garland Road entrance and the Mockingbird exit and all existing side roads left open for full access and egress. Options to this proposal if funds are insufficient could allow the current loop road systems along East Lawther to remain as are, and the one-way pattern could first be operated on weekends only or for the three month spring peak but should be full-time permanent when it is imposed. The roadway and parking areas will be upgraded. A coordinated signage system will be provided throughout the road system. A lower speed limit should be imposed. During peak use times such as spring weekends, the operational modifications currently used along West Lawther and used along East Lawther before its closure into the loops will be imposed, including street closures to restrict access along most congested parts of the roadway until congestion is relieved. Regardless of the option utilized along East Lawther, the new connection with Buckner Boulevard within the northern Big Thicket/Sailing Club loop will be provided as well as the existing parking lots paved and organized. The hike and bike trail will be fully separated from the roadway along both East and West Lawther. Engineering study of the feasibility of a grade separation at East Lawther and the Bathhouse Cultural Center entrance road should be undertaken.

Advantages of Concept D include:

- Most compatible with traffic planning theories and flow patterns on other city major streets

- Best serves abutting residences
- Maintains the historic use of both West and East Lawtner as parkways and scenic recreational drives
- Maintains the widest user choice of park facilities
- Supports the greatest interaction of uses and users
- Moderate capital costs to implement
- Short time frame to implement
- Enforces the image of White Rock as a single unified park, especially if East Lawtner is included
- Previously tested to some degree and found effective.

Disadvantages of Concept D include:

- Requires major reeducation of the public/users
- Fails to address fully the street congestion caused by overuse, especially by the pleasure drivers and commuters
- Fails to address the frustrations caused by conflicting uses within the same corridor
- Through traffic in the Bathhouse Cultural Center will cause hazardous conflicts and may require separation
- Likely to cause increased use of the park road by non-recreational commuter traffic to avoid Garland/Buckner signal.
- Some adjacent residents may view this as an intrusion to their specific neighborhood.

CONCEPT E: PERMANENT ONE-WAY/REVERSED ALIGNMENT

This concept is similar to Concept D except that West Lawtner is proposed as one-way northbound between Williamson Road and Mockingbird and East Lawtner is suggested as southbound between Mockingbird and Garland Road. An option could allow East Lawtner loop system to remain as is rather than be reopened as part of this one-way concept. The current peak hour operation modifications will be imposed to restrict additional access until congestion is relieved. Again, a coordinated signage system must be developed to interpret this new system throughout. The feasibility of a grade separation at East Lawtner/Bathhouse intersection should be studied.

Advantages to Concept E include:

- Similar benefits as Concept B and D
- Maintains historic use of East and West Lawtner as parkways and scenic recreational drives
- Best serves abutting residents
- Enforces image of White Rock as a single unified park.

Disadvantages of this concept include:

- Similar disadvantages as Concept C
- Contrary to normal traffic flow theory and practice
- Encourages increased park access traffic along neighborhood streets, especially on west side

- Through traffic in the Bathhouse Cultural Center area will cause hazardous conflicts
- Fails to address conflicting uses within same corridor
- Likely unpopular with neighboring residential areas
- Requires significant reeducation of the user public.
- Some adjacent residents may view this as an intrusion to their specific neighborhood.

CONCEPT F: PEDESTRIAN/TRANSIT PARK

This concept suggests the closure of both West and East Lawther Drives and all side streets within White Rock Lake Park to all private vehicular traffic, except for those requiring access to residents. The existing roadway will be developed and maintained as a pedestrian and bicycle corridor, with roadway widths narrowed and parking lots removed so that turf and forest areas may be restored. Regular maintenance/security and emergency vehicles will use this pedestrian/cycle trail and could be provided by smaller vehicles such as Cushman's. A continuing mass public conveyance system utilizing specifically prepared smaller bus or tram vehicles will circulate through the park at short intervals on the existing roadways from satellite parking lots developed on existing external park lands or even nonpark properties. Direct vehicular access will still be provided to major facilities/activity nodes such as the ball diamond complex and party buildings by separate limited access roads extended from neighborhood residential streets and to the boat clubs and launching facilities either by separate access roads or by special manual or automated identification systems along the existing road system. Special event traffic will still be accommodated by the roadway and at temporary areas and times. Added pedestrian security could be provided by portable or fixed emergency response phones. Ultimately, Bathhouse and boat launch access could avoid intersection conflict by grade separation. The shuttle system could be operated by DART, PARD or private contractor, but smaller 20 passenger buses should be used to best complement the anticipated number of users and the configuration of the park roadway. Ultimately nominal fees could be charged to assist operation costs.

Advantages of this concept include:

- Perceived by some area residents as best
- Best addresses/eliminates traffic congestion of overuse
- Best addresses/eliminates conflicts between competing users of the same road corridor
- Maximizes security, control and emergency access even at peak use times
- Allows greatest flexibility for recreational activity programming
- Maintains the historic image of White Rock Park as a single park unit

Disadvantages of Concept F include:

- Requires extensive manual or automated access system to allow transit but restrict all but abutting residential traffic
- Longest time to implement
- Highest capital cost to implement

- Extremely labor and equipment intensive, requiring continued high operation and maintenance costs
- Eliminates the historic image and use of White Rock Lake road system for pleasure driving
- Likely the least popular with public and users
- Least compatible with use of existing facilities, especially boating facilities and Bathhouse.

CONCEPT G: MAXIMIZED LOOP SYSTEM

Concept G suggests the development of a series of loop roads and separate park units on the west side of the lake similar to the redevelopment recently undertaken on the east side. This concept is best accomplished by utilizing portions of West Lawther and selected side streets as well as a new side street extension to achieve three major loop systems as independent park developments. The pedestrian and bicycle trail system will be maintained throughout to connect the subunits, often utilizing the abandoned roadway as accomplished in the East Lawther redevelopment. New park entrances will be created or enhanced for each loop subsystem to enhance the new park image and the external access to each. One or more of these looped park units may require the operational modifications currently underway either full-time or at selected peak use periods. The remaining roadways which form the loop systems will be upgraded by urban street designs and traffic control devices. Additional recreational facilities could be added to increase the recreational capacity and appeal of each loop park unit, while the major connection as part of White Rock Lake Park would be maintained. The East Lawther loop systems will be completed and upgraded.

Advantages of Concept G include:

- Provides maximum separation of conflicting uses
- Best accommodates boaters' desire for separate access at Lilly Pad Bay
- Adequately serves abutting residents
- Provides a consistent and independent circulation system
- Maximizes security, control and emergency access even at peak use times
- Allows great flexibility for programming of facilities
- Supports long-range reorganizational flexibility and grouping of complementary facilities
- Complements area street and thoroughfare system.

Disadvantages of this concept include the following:

- Requires major reeducation and reorientation
- Leaves areas of major existing congestion/conflict intact along West Lawther and may intensify conflicts due to reduced area and options
- High capital cost to implement
- Longer time frame to implement
- Difficult to phase developments without disruption of recreational functions and neighborhoods
- Limits users choice of facilities
- Eliminates historic image and use of White Rock Lake Park as the major regional recreation resource in Dallas

- Eliminates the use of Lawther Drive as a major recreational parkway, likely the last in Dallas
- Likely unpopular with the public and users.
- Some adjacent residents may view this as an intrusion to their specific neighborhood.

CONCEPT H: MINIMIZED LOOP SYSTEM

This proposal is similar to Concept G and creates a limited number of loop roads and separate park units. Along West Lawther, two separate loop systems would provide access to the major recreational areas as well as to the majority of the residential units while the remainder of the roadway would be completely closed to vehicular traffic and converted to pedestrian and bicycle use. Private residential access will be maintained within loop systems. As an option, a mass public transit system, similar to Concept F, could circulate through the park on existing corridor but would require manual or automated control points to separate private vehicles from transit access. The East Lawther loops will be further reduced by providing access to only the major destination facilities through extensions of existing residential streets. East Lawther south of Winfrey Point will be provided for lake front expansion for the Dallas Arboretum and Botanical Gardens, also thereby reducing the longest one-way link within the vehicle system and its conflicts between vehicles and cyclists.

Advantages of Concept H include:

- Similar to the advantages of Concept G
- Provides maximum separation of conflicting uses
- Best isolates and controls major activity areas of T.P. Hill and Lilly Pad Bay parking lot and boat launching ramp
- Maximizes security, control and emergency access even at peak use periods
- Provides consistent and dependable circulation system
- Adequately serves abutting residents.

Disadvantages of Concept H include:

- Similar to the disadvantages of Concept G
- Leaves areas of major congestion/conflict along West Lawther intact and may intensify conflicts due to reduced area and options
- Requires new road construction to create southern/T.P. Hill loop, disrupting Lakewood Park and/or residential neighborhood
- High capital cost to implement
- Eliminates historic image of White Rock Lake as a single park unit
- Eliminates the historic use of Lawther Drive for recreational driving, likely the last in Dallas
- Likely unpopular with the public and users as well as neighboring residents.
- Eliminates total free access to all of the lake's shoreline.

CONCEPT I: MODERATE LOOP SYSTEM

This concept is similar to Concepts G and H but would create two larger loop road systems with less elimination of the existing roadway and limited new construction. This system most closely approximates the current condition along West Lawther, but suggests the isolation of the major congestion and conflict areas of T. P. Hill and Lilly Pad Bay boat launching ramp. During peak use periods, the operational modifications currently in use will be imposed to eliminate park access until congestion is relieved. Ultimately, the loop systems could be made permanently one-way to increase traffic capacity, as outlined in Concepts D and E. Public transit opportunities could be utilized somewhat like proposal F. The East Lawther road system would remain largely as it is currently except that the area south of Winfrey Point should be provided for lake front development and expansion of the Dallas Arboretum and Botanical Garden, thereby reducing the length of the major one-way link within the system.

Advantages of Concept I include:

- Similar advantages as Concept G and H
- Best maintains image of existing park and street pattern
- Maintains most of West Lawther as pleasure drive
- Adequately serves abutting residents
- Provides separation of conflicting uses at major activity nodes
- Best isolates and controls major activity area of Lilly Pad Bay parking lot and boat launching ramp
- Allows greatest flexibility for programming of major facilities and open spaces
- Complements the existing area street and thoroughfare system.

Disadvantages of this concept include:

- Similar disadvantages as proposals G and H
- Fails to fully address frustrations of conflicting users within the same corridor
- High capital cost to implement
- Likely not to achieve the desired level of control of congestion
- Gradually declining level of service as traffic volumes increase
- Perceived by some area residents as ineffective.
- Eliminates total free access to all of the lake's shoreline.

CONCEPT J: SEPARATE PARK ROAD

This concept suggests the complete separation of recreational traffic from non-recreational residential and commuter traffic, through the creation of a new roadway to parallel with Lawther. This new park road would extend between the old pump station on the south to Cathedral Drive on the north and then utilize the existing roadway on to Mockingbird Lane. This new park road will remain under the maintenance and operational control of the Park and Recreation Department. Residential traffic would largely use the existing park roadway, which will be upgraded to city street standards and turned over to the Department of Streets and Sanitation for maintenance and operation,

between Hillgreen Lane and Fisher Road, then use the improved Fisher Road/Branchfield/Windy Lane and park road to link with Williamson Road. The park roadway need only be separated from the old by a 30 to 50 foot greenbelt, but due to the limited park land along West Lawtner will likely require considerable fill along the shoreline in order to reclaim areas of the lake for its construction corridor. New park entrances should be enhanced to emphasize the separation of this new park road, and the pedestrian and bicycle function of the existing West Lawtner Drive relocated to this corridor. Emergency access points should be provided at limited points such as Fisher and Hillgreen, and the new park road permanently connected to the public street system for public access only at the extreme southern and northern ends. Operational modifications similar to those suggested in Concepts A and B will be imposed to relieve congestion during peak use periods. A low speed limit more conducive to pleasure driving will be considered on the park road discouraging its use by through commuter traffic.

Advantages of Concept J include the following:

- Best serves abutting residents
- Separate residential/commuter traffic from park traffic, at least initially
- Closest to current image of White Rock Lake Park and existing conditions
- Maintains historic use of White Rock Lake Park for scenic driving
- Maintains the widest user choice of park facilities
- Supports greatest interaction of users and uses.

Disadvantages of Concept J include:

- May likely fail to address the street congestion, which may simply be relocated to the new park road
- Fails to address the frustrations caused by conflicting park users within the same corridor
- Longest time required for implementation
- Highest capital cost required for implementation
- Utilizes already limited park lands for circulation systems
- Major environmental disruption
- Requires reorientation of six private residents along Wendy Lane.
- Reduces visual quality of the lake.

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RECOMMENDED STRATEGIES

Comparative Analysis of Alternatives

A thorough evaluation of the ten alternative concepts and their impacts and implications provides a comparison of these varied concepts against a similar criteria in order to achieve a truly equitable comparison. The Conceptual Design Evaluation Matrix, found in the appendix, evaluates each concept against a broad list of criteria which represents conditions, characteristics or consequences of the proposal.

These criteria include the required timing, capital and operation/maintenance cost, flexibility both in construction phasing and management adaptability, compatibility with existing development both within and outside of the park, impacts on public infrastructure or streets, utilities and facilities both within and outside of the park, likely image and desire concerning the proposal, and the effect of each on the level of use and service of the park. Many of these criteria are somewhat subjective and held in differing levels of importance by various interests approaching the evaluation. Therefore, no implication of value is assigned any criteria, and the matrix simply indicates the presence or absence of the condition which each individual evaluator can order as seen fit. In fact, the evaluation process attempts to include various likely levels or definitions of each impact.

These alternative circulation concepts may be more generally grouped into 5 distinct categories by type of improvement. Concepts A, B, and C all reflect temporary management measures directed toward traffic operations rather than physical manipulations or improvements. The common theory underlying each has already been utilized and proven effective for controlling traffic volumes and reducing accidents and undesirable behavior in White Rock Lake Park for several years. Either of these concepts would provide adequate management of the park circulation system throughout the near future even with increases in traffic volumes. Specifically, Concept A is currently working effectively, and while Concept C would perhaps reduce use and volumes due to its competition with normal regional traffic flow patterns, it would cause more disturbances than benefits obtained both within the park and adjacent neighborhoods. Concept B is the best of these management measures and addresses the need to upgrade the current system at least to the degree planned when it was implemented several years ago and would not necessarily impact residential neighborhoods as would C and some other physical renovation alternatives.

Alternative Concepts D and E represent differing approaches to one-way systems. Each would effectively double the full-time capacity of the road-way yet maintain White Rock as a single regional park entity in keeping with its current and historic use. Concept D appears the better of these two alternatives, as E would frustrate the normal traffic flow patterns and bring negative impacts in the adjoining neighborhoods without sufficient increase of benefits to justify these impacts.

Concept F, which would produce an entirely pedestrian park by eliminating all internal vehicular circulation within the park, is felt too drastic a move and

not yet warranted by the magnitude of park problems, nor would it be acceptable to the Dallas population. The size and linear configuration of this park and the low level of public transit use in Dallas make this proposal unfeasible, especially since it also reflects the highest ongoing operations and maintenance cost.

Alternatives G, H and I represent differing configurations of loop road systems which subdivide the park into various subunits as has been done recently to East Lawtner. Concepts G and H each require the construction of new roadways which would disrupt the residential neighborhood, Lakewood neighborhood park and perhaps White Rock lakeshore as well. Operation of all three of these alternatives would be costly to implement, negatively impact neighboring street systems and destroy the image and use of White Rock as a regional park.

Concept J, which would provide a new park road system completely separate from city residential streets, is theoretically perhaps the best answer for the long-term development of the park. However, the concept may simply double the problem if the intended separation of park and commuter traffic cannot be enforced. This concept is initially the most costly to provide, both economically and environmentally, and would require a significant time to implement in order to reclaim sufficient lake area for the roadbed.

A thorough evaluation of the ten alternatives against these criteria, suggests that Concept B is clearly the best alternative for the short-term and Concept D is best for the long-term.

SHORT-TERM ACTIONS

The short-term is considered to be 3 to 5 years, primarily because public works decisions require at least this length of time to define the project in detail, arrange financing, prepare plans and initiate construction. Another difficulty experienced in redevelopment projects such as this, is that it is often difficult to phase the development, and even temporary improvements such as traffic signs cause some disruption of the existing function and level of capital expenditures and require careful scheduling. However, various improvements can be implemented immediately in order to help relieve the current problems and improve the conditions for the future.

The intensified management definition of recommended Concept B includes several operational aspects which could be implemented as part of an immediate, short-term strategy. All existing vehicular and personal conduct legislation should be strictly enforced, and police surveillance increased to enhance the security and enforcement. The complete prohibition of alcohol use within the park could successfully eliminate the source of many so called behavioral problems. The current speed limit should be reevaluated to determine the feasibility of reduction to 15 mph, but increased enforcement applied to reduce speeds to the regulated level regardless. Programming of recreational activities and special events should be carefully scheduled to prevent potential conflicts during the park's peak use periods. Preventive and corrective maintenance should be increased in an attempt to enhance the appearance of the grounds and facilities and encourage better care and conduct by park users.

Several physical and structural adjustments are also suggested as part of the initial short-term improvement strategy. The new roadway connecting the Big Thicket/Sailing Club loop with Buckner Blvd. should be completed, in order to eliminate the congestion and potential hazard of this long two-way cul-de-sac. Offstreet parking lots should be paved and properly striped to accommodate intended levels of use. The hike and bike trail should be completely separated from the vehicular circulation system, especially at the hazardous Mockingbird and Garland bridges and the trail improved to eliminate hazardous landscape encroachment, severe curves and intersections with roadways and parking. Recreational facilities should be clustered in the vicinity of parking lots rather than scattered along the roadways and shoreline and throughout the park. The deteriorating park roadway should be repaired and upgraded to a more urbanized quality, including curbs and gutters to eliminate deterioration of shoulders and left turn lanes to reduce interruptions to traffic flow. A coordinated sign system should be installed throughout the park to provide enforcement and information. Emergency telephone stations should be installed along the hike and bike trail to provide increased levels of security. A major reforestation and landscaping program should be initiated in order to reverse the deterioration of the park environment.

No estimates of the cost of these short-term immediate improvements have been made. Little of this work can be accomplished by the staff and annual budget of the Park and Recreation Department, and most must be part of a future bond program. Some of the projects could be accomplished through joint funding with the private sector.

LONG-TERM ACTION RECOMMENDATIONS

During this initial 3 to 5 year short-term development program, the circulation system should be reevaluated and more detailed long-term future plans formulated. It may be, that changes will occur in park use, society and the physical character of the neighboring area to make other alternatives more feasible at that time. The permanent one-way management program will likely be justified in future years before major redevelopment of the roadways is feasible.

However, if no additional funding is obtained within the short-term action period, the more costly of these improvements will have to be deferred until later bond programs or other funding sources are found. These improvements will in effect then become long-term recommendations.

While it is believed these circulation schemes will provide the important basic street framework necessary to guide future park development adequately, it should be reemphasized that circulation is closely related to the development and use of other park systems and the interrelated potentials and problems of White Rock Lake Park. The comprehensive master plan and management program should address the circulation system as it relates to the location and treatment of specific recreation facilities, nature preservation and interpretation, reforestation and landscaping, facilities constructions and behavioral regulations.

APPENDICES

MAPS

- Concept A: Maintain Status Quo
- Concept B: Intensified Management/Operations
- Concept C: North-Bound Temporary One-Way
- Concept D: Permanent One-Way/Normal Alignment
- Concept E: Permanent One-Way/Reversed Alignment
- Concept F: Pedestrian/Transit Park
- Concept G: Maximized Loop System
- Concept H: Minimized Loop System
- Concept I: Moderate Loop System
- Concept J: Separate Park Road

CONCEPTUAL DESIGN EVALUATION MATRIX

MAPS

- Accident Analysis
- Crime Analysis

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**CONCEPT B
INTENSIFIED MANAGEMENT /
OPERATIONS**

↔ Normal Traffic Flow

← Peak Traffic Flow

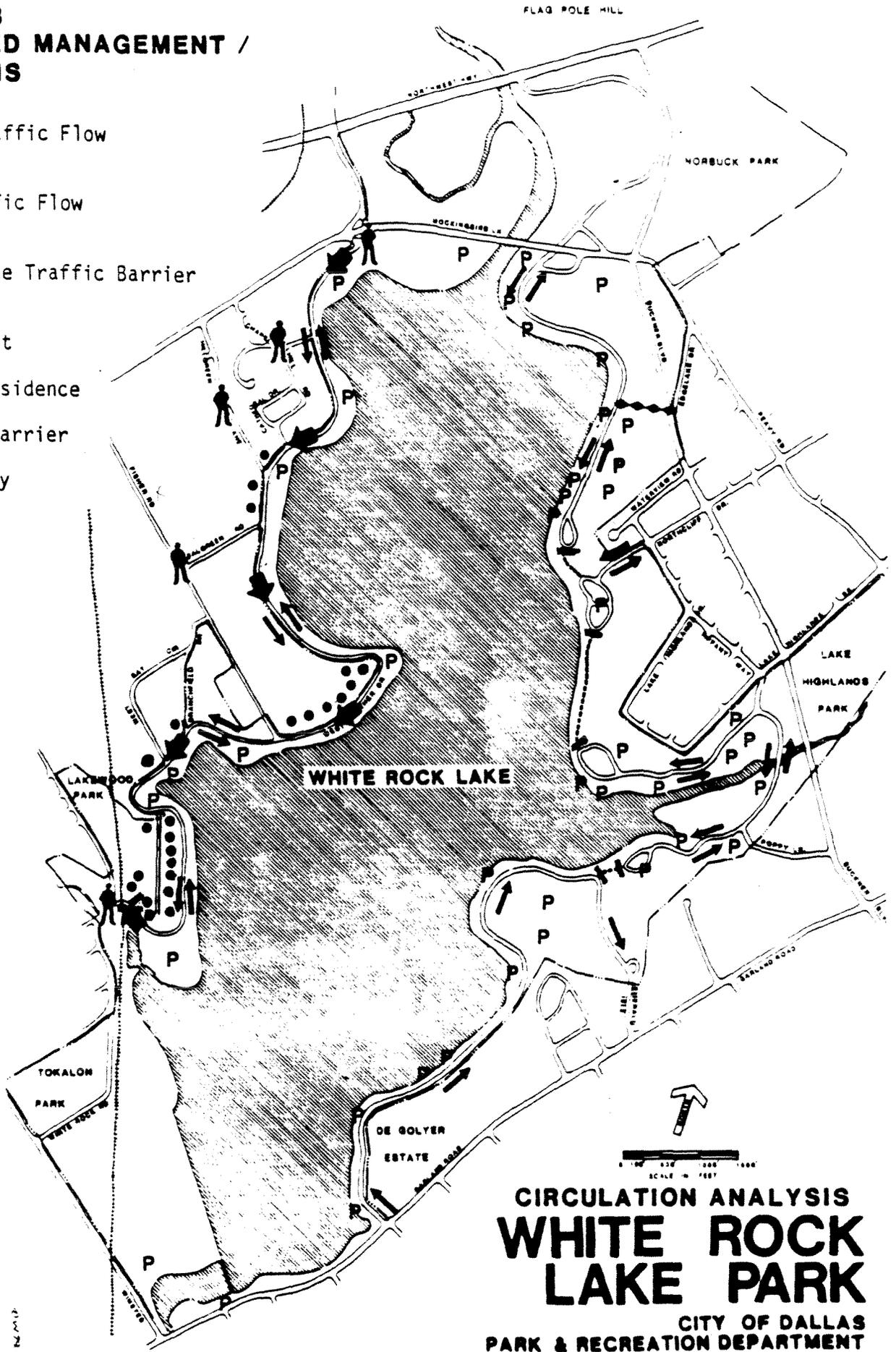
👤 Park Police Traffic Barrier

P Parking Lot

● Private Residence

- Improved Barrier

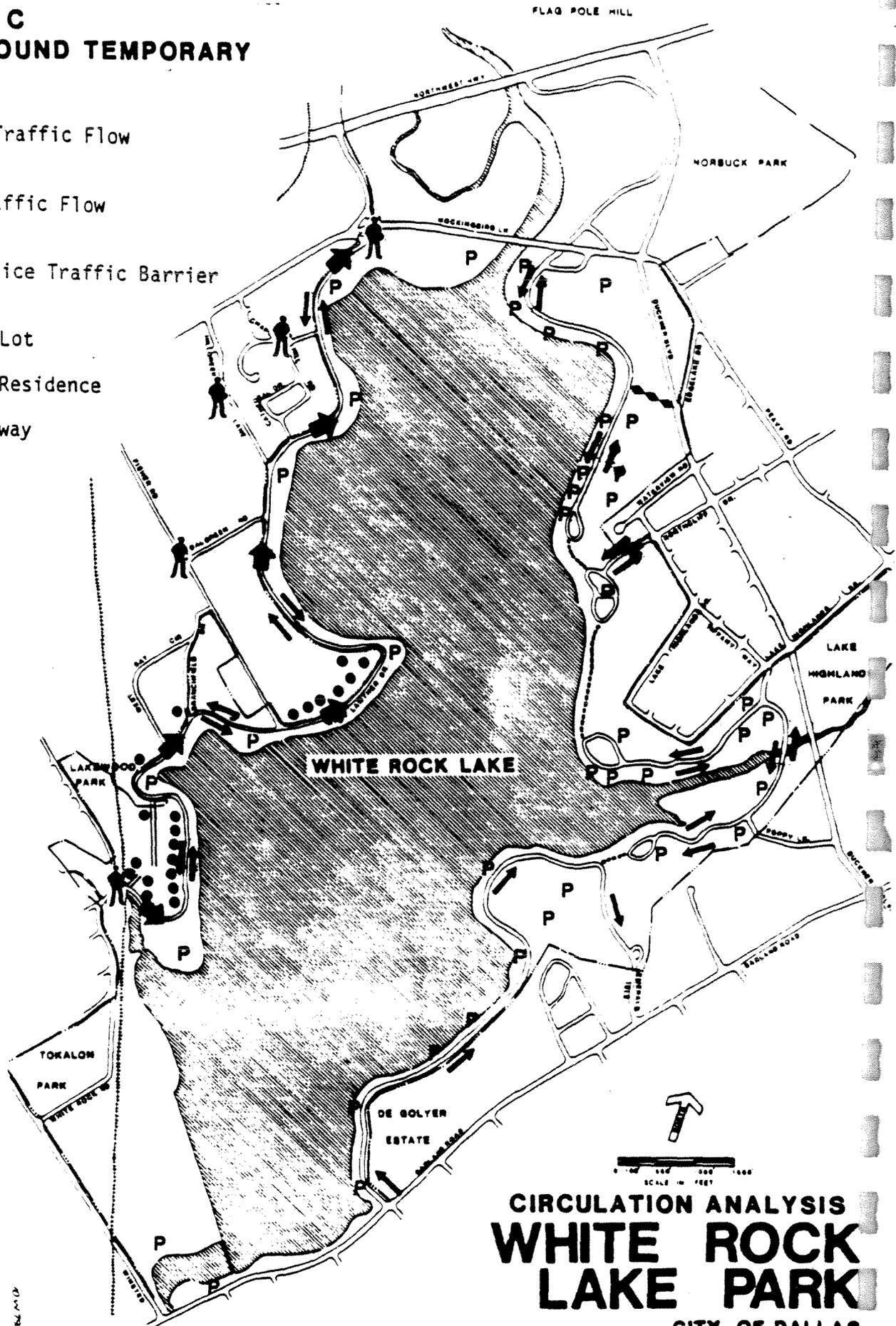
◆◆◆ New Roadway



**CIRCULATION ANALYSIS
WHITE ROCK
LAKE PARK**
CITY OF DALLAS
PARK & RECREATION DEPARTMENT

**CONCEPT C
NORTH-BOUND TEMPORARY
ONE-WAY**

-  Normal Traffic Flow
-  Peak Traffic Flow
-  Park Police Traffic Barrier
- P** Parking Lot
- Private Residence
-  New Roadway

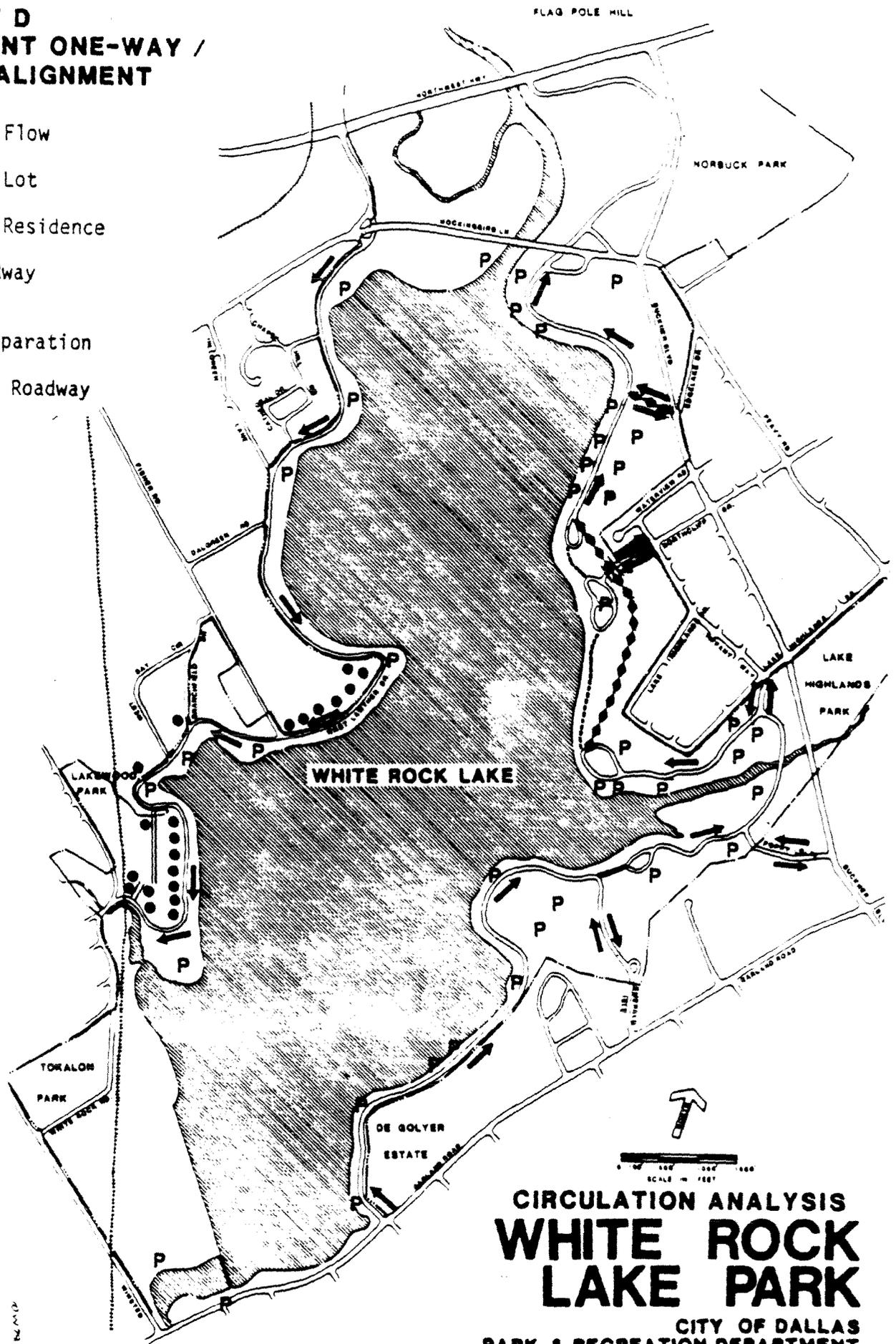


**CIRCULATION ANALYSIS
WHITE ROCK
LAKE PARK**

**CITY OF DALLAS
PARK & RECREATION DEPARTMENT**

**CONCEPT D
PERMANENT ONE-WAY /
NORMAL ALIGNMENT**

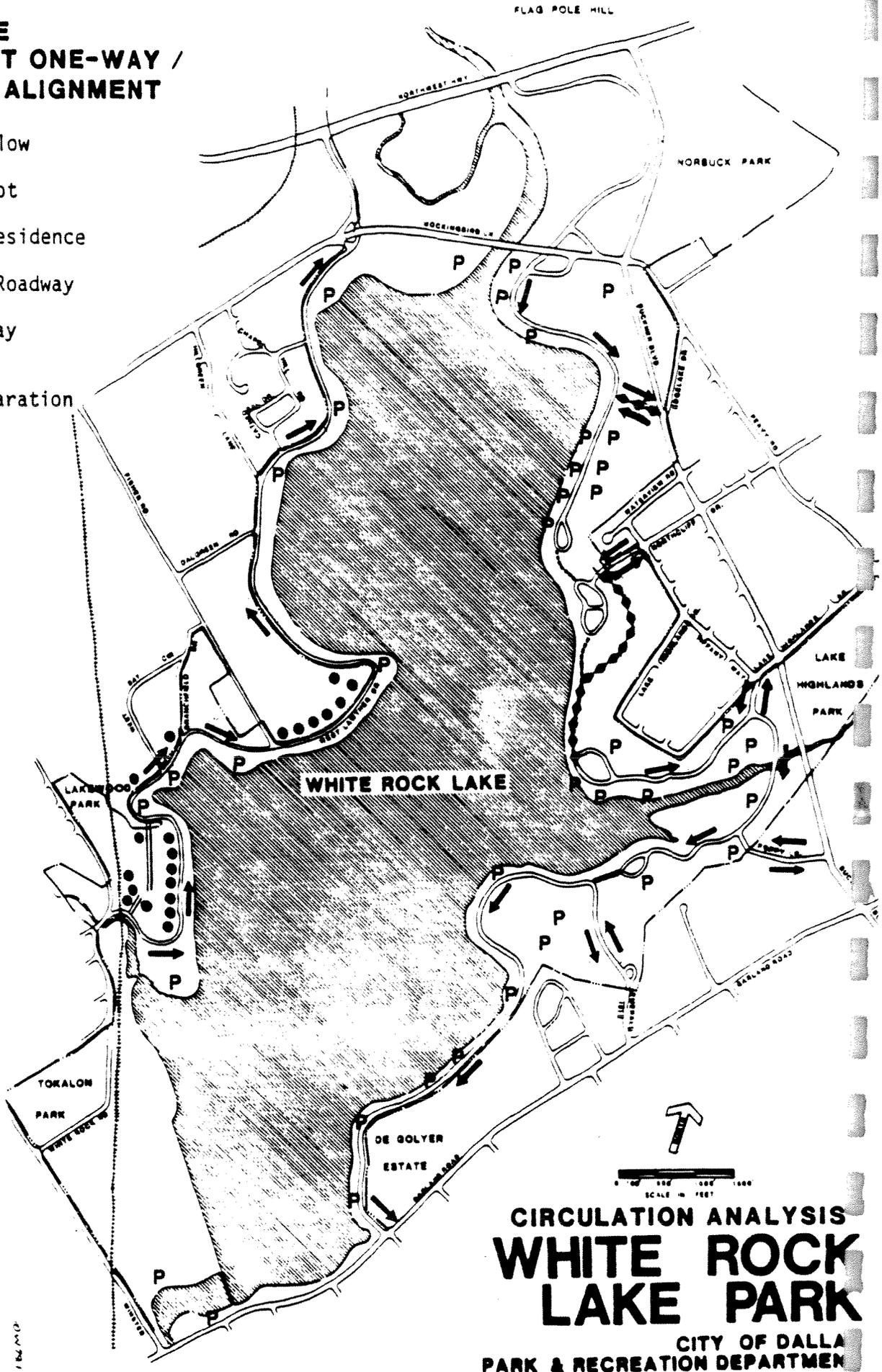
- ← Traffic Flow
- P Parking Lot
- Private Residence
- ◆◆◆ New Roadway
- ⊥ Grade Separation
- ▬ Improved Roadway



CIRCULATION ANALYSIS
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**CONCEPT E
PERMANENT ONE-WAY /
REVERSED ALIGNMENT**

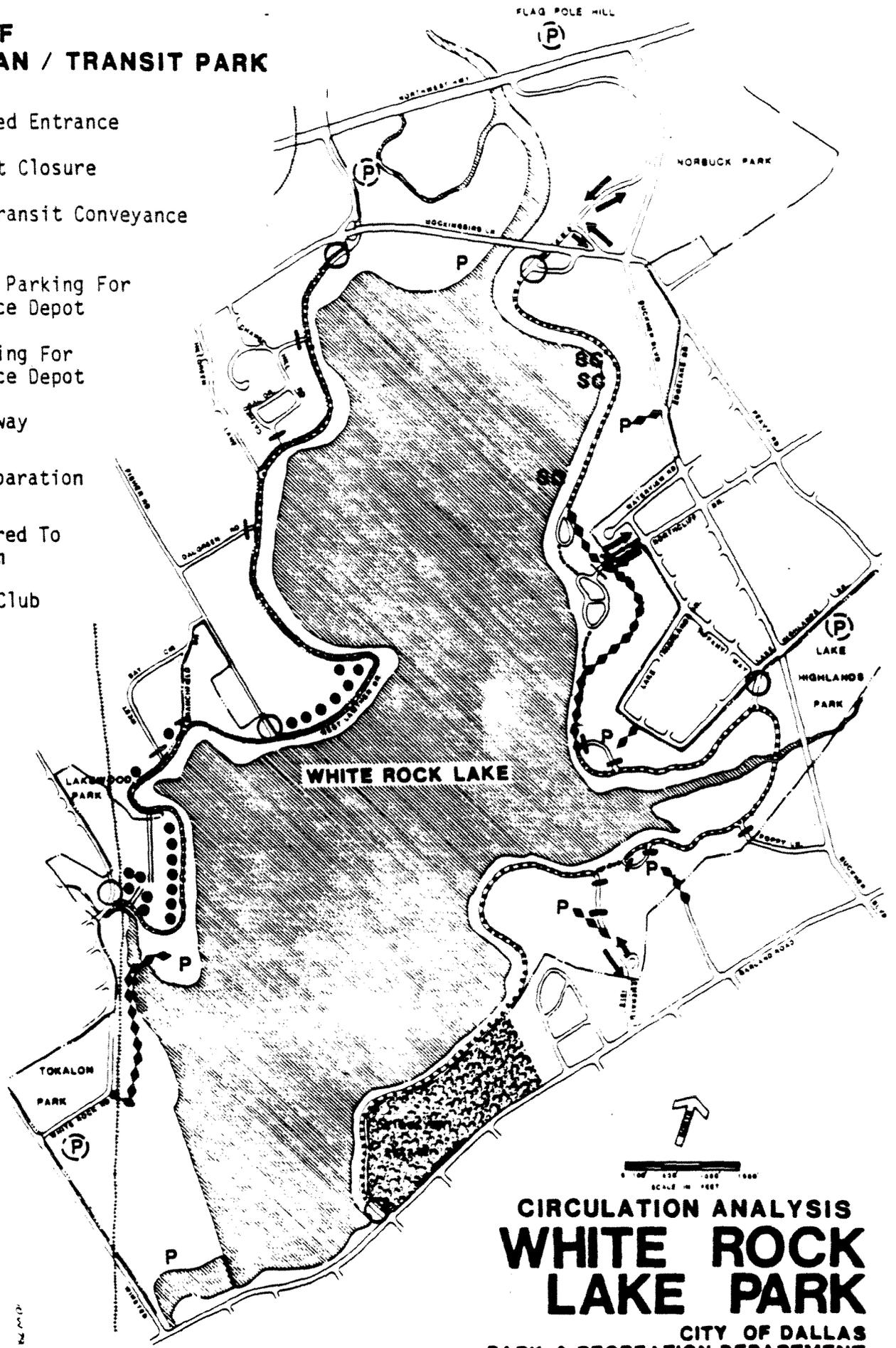
- ← Traffic Flow
- P Parking Lot
- Private Residence
- Improved Roadway
- New Roadway
- Grade Separation



CIRCULATION ANALYSIS
**WHITE ROCK
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CONCEPT F PEDESTRIAN / TRANSIT PARK

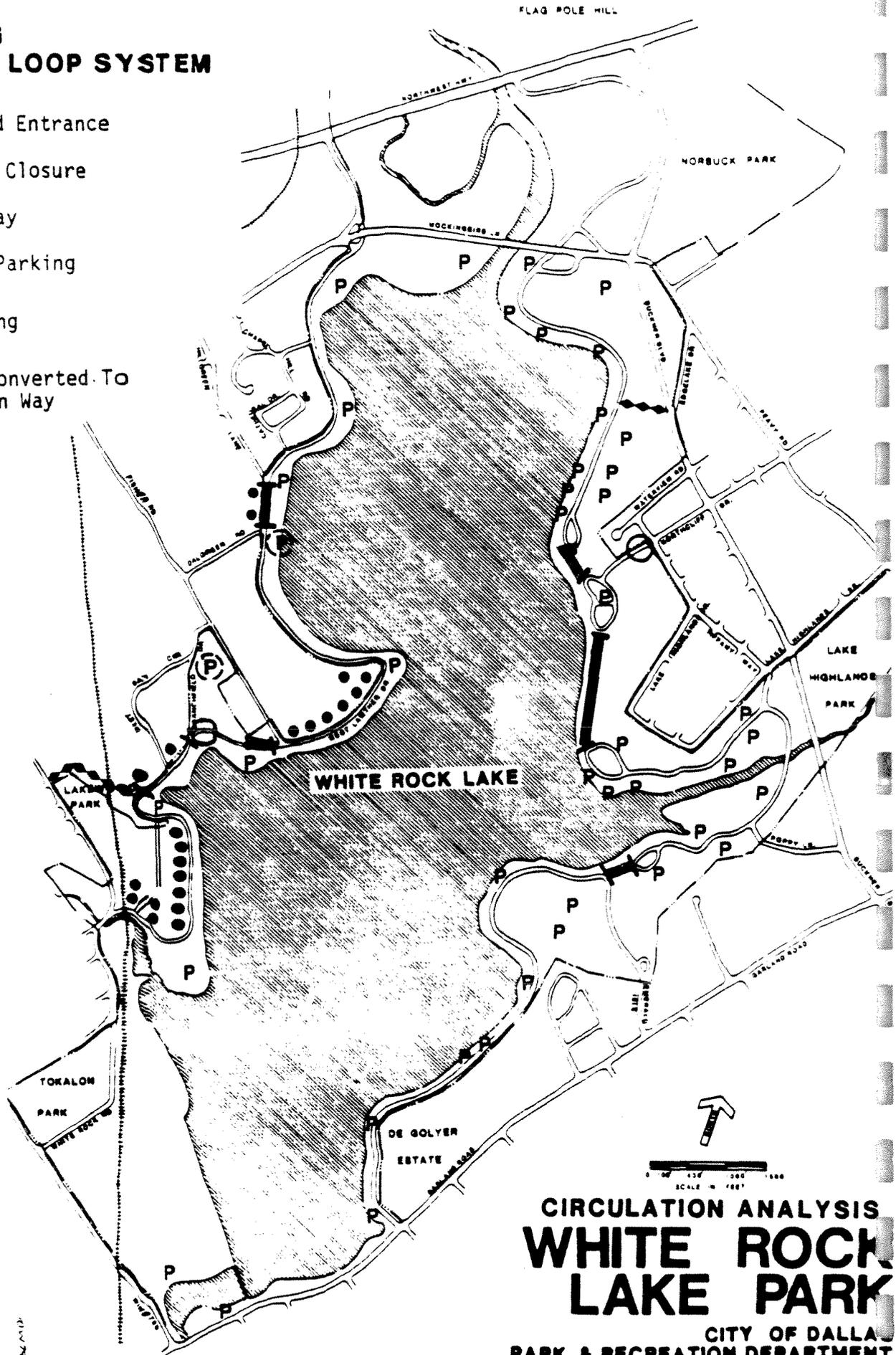
- Controlled Entrance
- Permanent Closure
- Public Transit Conveyance
- P Existing Parking For Conveyance Depot
- (P) New Parking For Conveyance Depot
- New Roadway
- ≡ Grade Separation
- ⊗ Transferred To Arboretum
- SC Sailing Club



CIRCULATION ANALYSIS
**WHITE ROCK
 LAKE PARK**
 CITY OF DALLAS
 PARK & RECREATION DEPARTMENT

**CONCEPT G
MAXIMIZED LOOP SYSTEM**

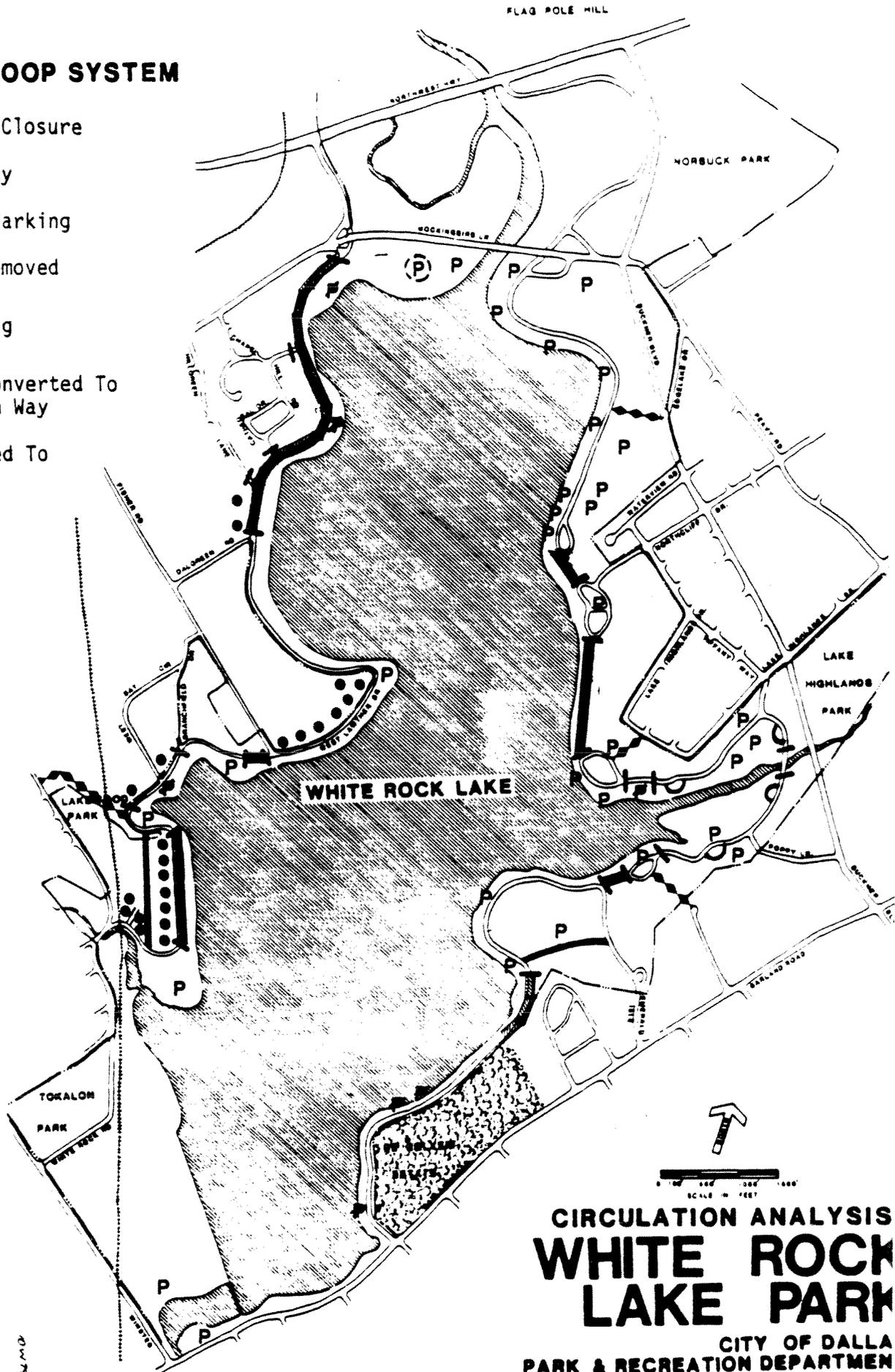
- Controlled Entrance
- Permanent Closure
- ◆◆◆ New Roadway
- P Existing Parking
- (P) New Parking
- ▨ Roadway Converted To Pedestrian Way



CIRCULATION ANALYSIS
**WHITE ROCK
 LAKE PARK**
 CITY OF DALLAS
 PARK & RECREATION DEPARTMENT

CONCEPT H MINIMIZED LOOP SYSTEM

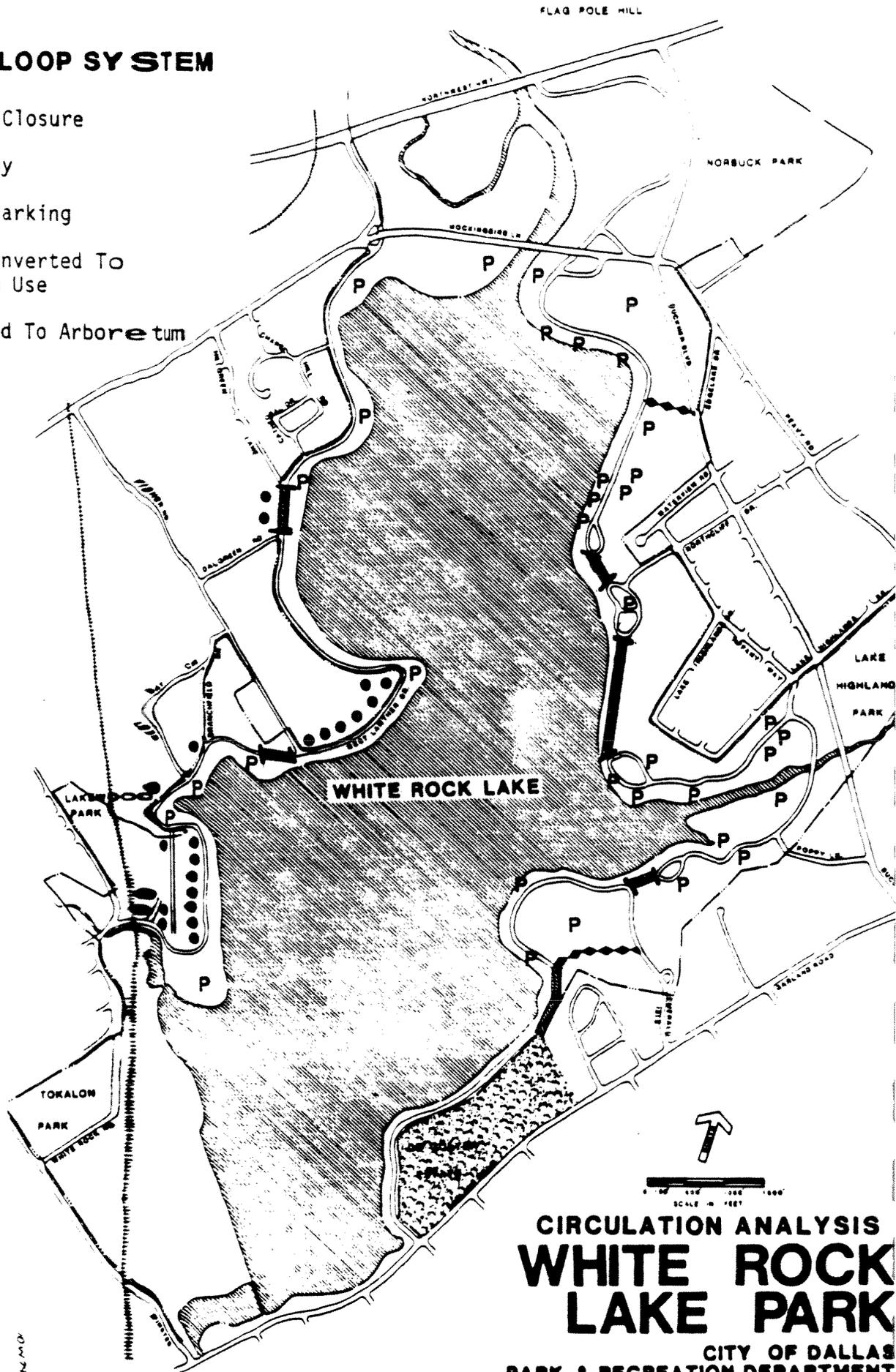
- Permanent Closure
- ◆◆◆ New Roadway
- P Existing Parking
- ⊖ Parking Removed
- (P) New Parking
- ▨ Roadway Converted To Pedestrian Way
- ⊘ Transferred To Arboretum



CIRCULATION ANALYSIS
**WHITE ROCK
 LAKE PARK**
 CITY OF DALLA
 PARK & RECREATION DEPARTMENT

CONCEPT I MODERATE LOOP SYSTEM

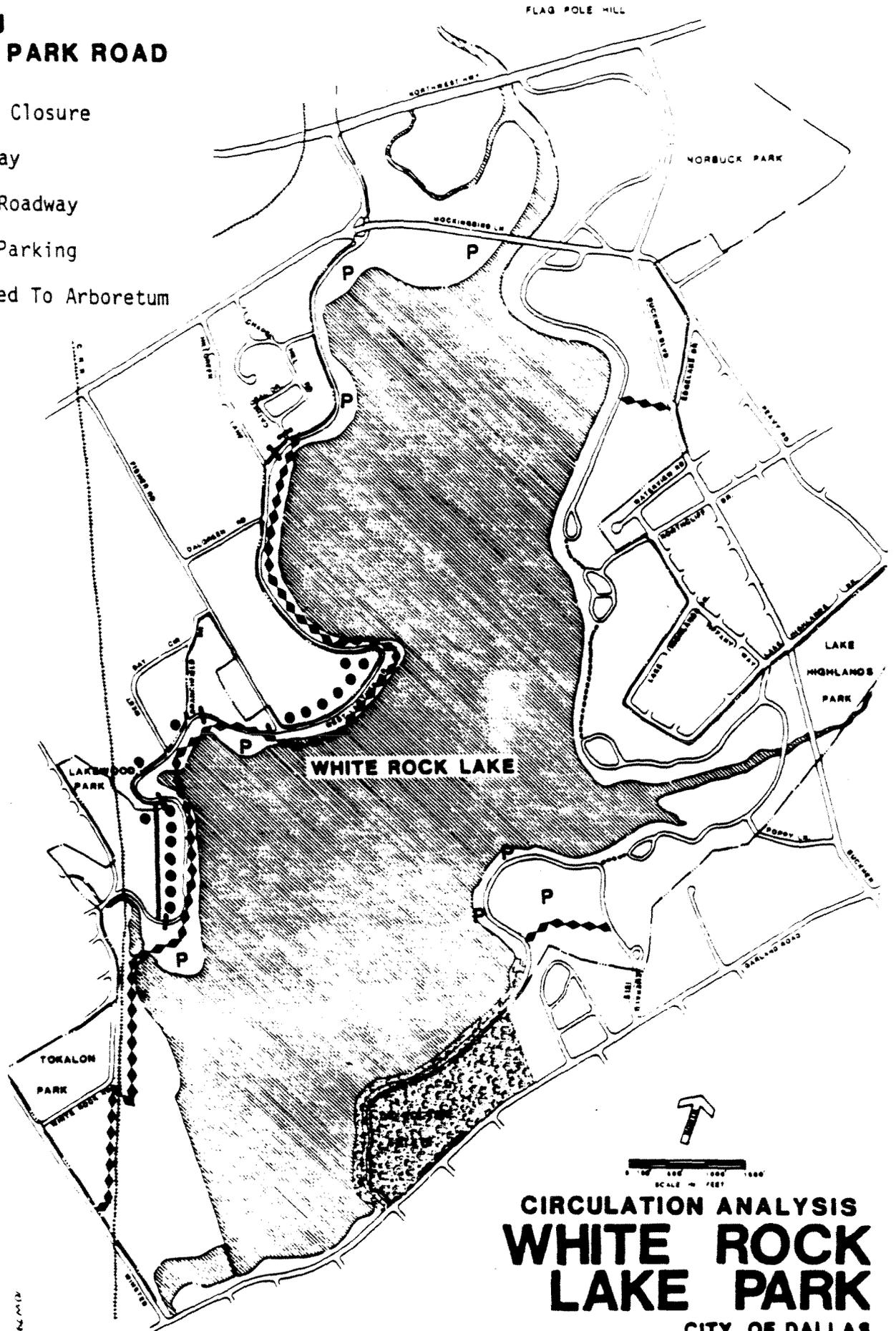
- Permanent Closure
- ◆◆◆ New Roadway
- P Existing Parking
- ▨ Roadway Converted To Pedestrian Use
- ◆◆◆ Transferred To Arboretum



CIRCULATION ANALYSIS
WHITE ROCK LAKE PARK
 CITY OF DALLAS
 PARK & RECREATION DEPARTMENT

**CONCEPT J
SEPERATE PARK ROAD**

- Permanent Closure
- ◆◆◆ New Roadway
- ▬ Improved Roadway
- P Existing Parking
- ▨ Transferred To Arboretum



**CIRCULATION ANALYSIS
WHITE ROCK
LAKE PARK**
CITY OF DALLAS
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CONCEPTUAL DESIGN EVALUATION MATRIX
WHITE ROCK LAKE PARK

CONCEPTS

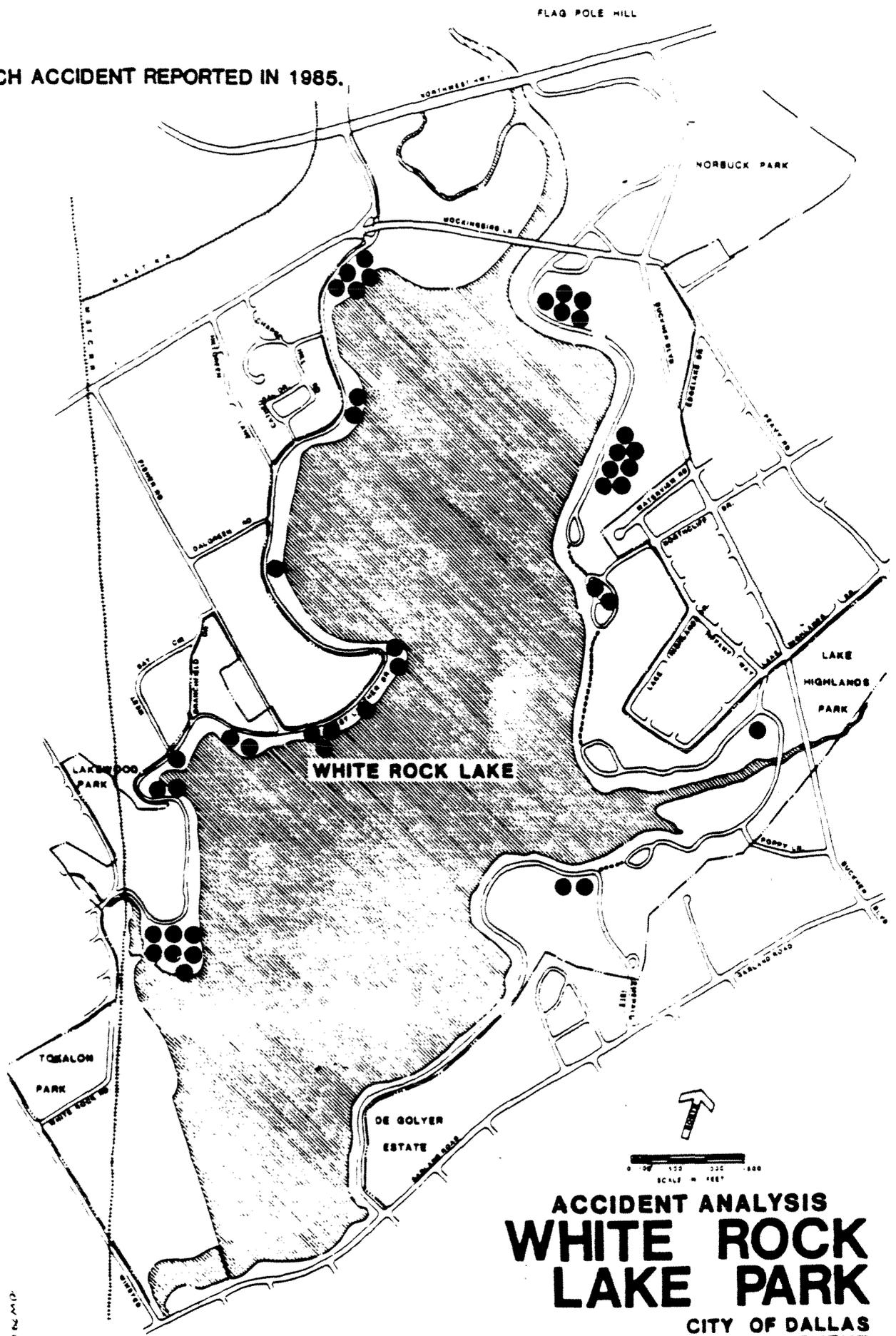
CONDITIONS/CHARACTERISTICS/CONSEQUENCES

A B C D E F G H I J

A	B	C	D	E	F	G	H	I	J	
X	X	X	X	X				X		1. Implementable within short time frame.
					X	X	X		X	2. Requires long range implementation.
X	X	X				X	X	X		3. Allows efficient phasing of development and circulation improvements.
X	X	X	X	X		X	X	X		4. Complements other infrastructure systems within park.
X	X		X		X	X	X	X	X	5. Complements other infrastructure systems in surrounding area.
X		X	X	X						6. Requires relatively no capital investment.
	X							X		7. Requires low capital investment
					X	X	X		X	8. Requires high capital investment.
X		X	X	X					X	9. Requires no additional operation/maintenance cost.
	X						X	X		10. Requires limited additional operation/maintenance cost.
		X			X	X				11. Requires high additional operating/maintenance cost.
X	X	X	X	X		X	X	X	X	12. Complements area land use development patterns.
X	X	X	X	X	X				X	13. Unifies total park as functional unit identity.
						X	X	X		14. Emphasizes functional/use subparks greater than overall park.
					X	X	X	X		15. Minimizes opportunity and user choice of services.
X	X	X	X	X					X	16. Maximizes opportunity and user choice of services.
					X	X	X	X		17. Minimizes interaction/conflict potential of competing users.
X	X	X	X	X					X	18. Maximizes interaction/conflict potential of competing users.
X	X									19. Requires little public reeducation/reorientation.
		X	X	X	X	X	X	X	X	20. Requires much public reeducation/reorientation.
X	X	X			X				X	21. Allows seasonal or special event modifications.
X	X	X	X	X		X	X	X	X	22. Allows efficient emergency access.
X	X	X	X	X	X				X	23. Allows efficient security patrol/maintenance circulation.
X	X	X		X	X	X	X	X	X	24. Allows efficient security/emergency isolation/control.
	X				X	X	X			25. Requires modification of existing public policy/goals for park development.
X	X	X	X	X				X	X	26. Complements existing public policy/goals for park development.
X	X	X	X	X		X	X	X	X	27. Complements citizen aspirations/image for park.
						X	X	X		28. Accommodates lower level of park users.
X	X	X	X	X	X	X	X	X	X	29. Accommodates current level of park use.
X	X	X	X	X	X				X	30. Accommodates increased level of park use.

X indicates that the condition is present if concept is implemented; no values or ranking order is represented.

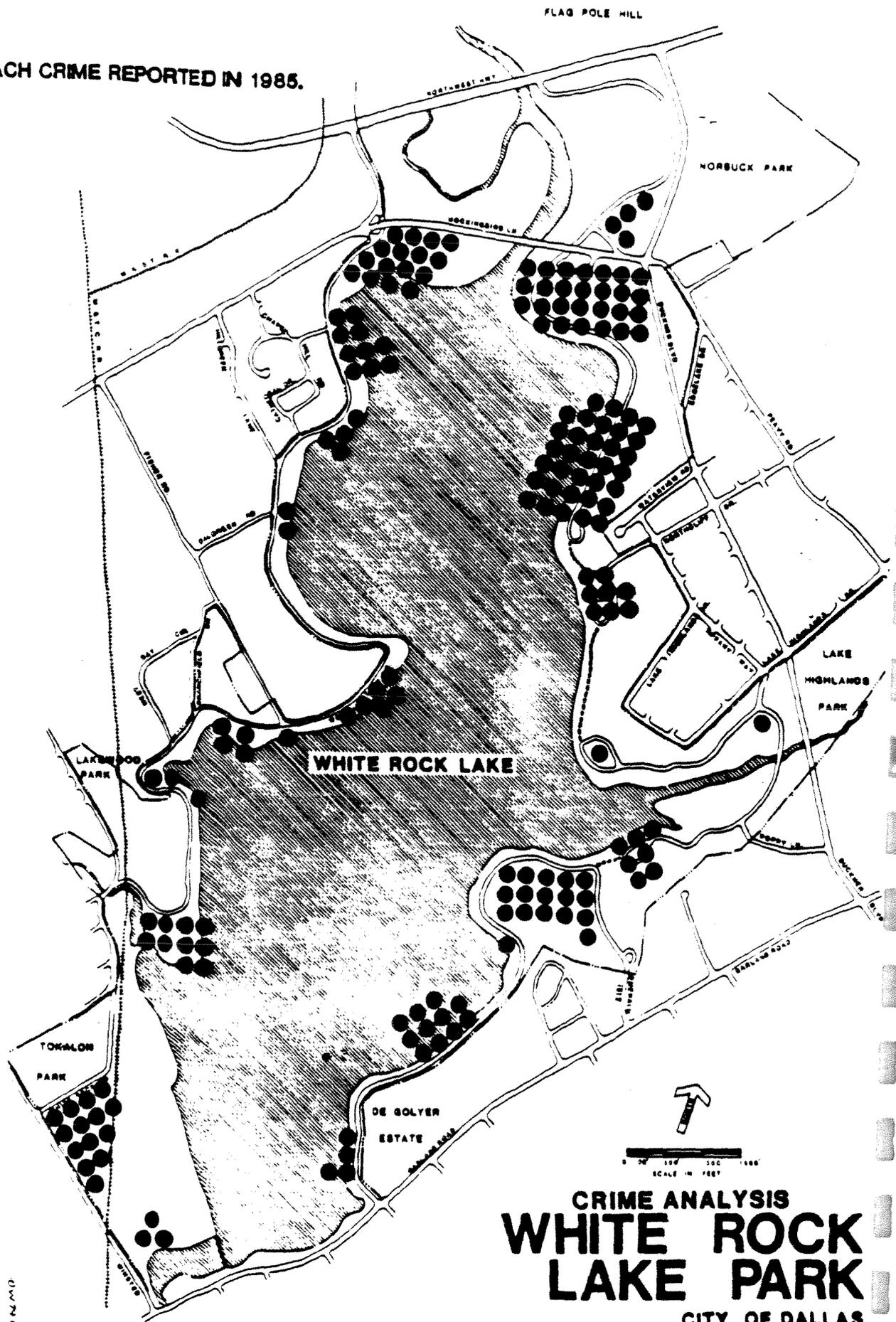
● EACH ACCIDENT REPORTED IN 1985.



ACCIDENT ANALYSIS
WHITE ROCK LAKE PARK
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1/24/85

● EACH CRIME REPORTED IN 1985.



CRIME ANALYSIS
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12/1/85