A STUDY OF PARKING AT OKLAHOMA STATE UNIVERSITY AND RECOMMENDATIONS FOR ENHANCEMENTS

Thesis Approved:

Charles L. Leider
Thesis Adviser

George E. Engwall, Jr.

Stephen W. Tweedie

Norman N. Durham
Dean of the Graduate College

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CHAPTER I

INTRODUCTION

Justification for Study

The tremendous increase in the number of automobiles owned by students, staff and faculty during the past decade has placed an increasing burden on parking facilities on the Oklahoma State University campus as it has on campuses all across the country. Although the 1982 OSU campus master plan, OSU: Stillwater Campus Development Concepts, includes parking facilities, in many cases the plan has not been followed or has been modified in various ways, particularly with regard to parking lots. The plan includes construction of parking structures to replace much of the surface parking, but such construction in the near future appears to be unlikely. (Farley, Eaton, Moser, Cobb, Allen - personal communications.) Unfortunately, the aesthetic aspect of landscape design in parking facilities has been neglected in many of the parking lots on the OSU campus. Since many of the existing surface parking lots exhibit few, if any, aesthetic considerations, enhancement of these lots would not only present a more pleasing appearance to their users and the public but would also provide other benefits (i.e. greater safety, better functional layouts, environmental modification, enhancement of the campus' street appeal and increase in the university's image as a dignified and established institution).

As stated by Lynch and Hack (1984), site planning cannot be a task that terminates after the plan is made. Carrying design intentions forward to management and actual outcomes back to the designer are essential links in the learning chain. Therefore, post occupancy evaluations are very informative, especially if based on the intended program.

With a view toward long-term improvement of both the appearance and the efficiency of parking facilities on the OSU campus, the current research was undertaken. The basic concept underlying the research was that aesthetic treatment of parking lots is compatible with parking lot efficiency. The scope of the problem was limited to a post-occupancy evaluation of parking facilities on the OSU campus together with proposed designs for representative lots as examples of how existing lots could be enhanced.

Purposes of the Research

The purposes of the current study were threefold:

1. to conduct a detailed survey of existing parking lots on the OSU campus.
2. to examine means of integrating utility and aesthetics in representative OSU parking lots.
3. to propose designs for three lots considered amenable to different approaches to enhancement.

The research presented here represents the beginning stages of what would be a much larger project if it were to be implemented campuswide.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The successful application of post planning evaluation and the enhancement of the landscaping design of an established campus require a thorough knowledge of the many factors contributing to institutional planning as well as the unique concepts, materials and regulations pertaining to landscape architecture. This literature review includes information available concerning establishment and implementation of long term institutional site plans with particular emphasis on parking problems and solutions on university campuses. General aspects of parking lot design, regulations pertaining to parking lots, and materials and concepts applicable to enhancement of parking lots with plant materials are reviewed.

The Long Term Site Plan or Master Plan

Large, stable organizations which occupy a permanent site and expect to exercise long term control over it, often prepare long term plans (master plans) for development of that site. Universities, hospitals and cultural centers are examples of these organizations; each has its own characteristic requirements for long term planning. Site planning for such institutions usually focuses on dignified appearance, utilities, access, expansion space and related considerations. If the grounds are more than a parking lot, a park-like setting may assure the outside observer of the competence of the institution. Universities, because they symbolize knowledge and culture, should reflect these values in the design of their grounds (Lynch and Hack, 1984).

Master Plans for Large Educational Institutions

Significant changes in university enrollment and in the composition of the student body were predicted as early as 1963 (Dober, 1963). Changes which have actually occurred include the assumption of additional functions by the university, increased heterogeneity of students' backgrounds, marked increase of married students (many with children) and a very high proportion of commuting students. Many of these changes have intensified the use of autos by students and visitors and have created serious campus parking problems (Turner, 1984).

The rapid increase in student numbers and in the make-up of the student body led many universities to either commission development of master plans for the first time or revise earlier ones. Greatly expanded parking space was a major consideration in these plans. When implemented, the increase in allocation of space to automobile parking resulted in some universities being literally inundated by asphalt and cars while others experienced a proliferation of unsightly parking garages.

Although there was a general increase in student enrollments for many years up to the early 1980's, the past few years have exhibited a decline in student numbers. As a result, universities have found themselves competing for students. One means of doing so has been to emphasize the quality of facilities, space and environment. This emphasis was summarized in a review of recently commissioned campus master plans (Karson, 1987) as follows: "The 'ten-second impression'--made at the front gate or central green--has been found to exert enormous influence on student (and parent) enrollment decisions. ..Today's planners consider the space created between buildings equally as crucial as that inside."

Master Plan Implementation by Universities

Even though master plans are commissioned by universities to serve as guides for their long-range planning, in many cases the assumptions which form the basis for such

plans are in error or unrealistic. Predictions of future building plans may sometimes be based on inaccurate or optimistic data or may not give adequate consideration to open space as well as building requirements. Although the symbolic form of the environment is considered important and is defended at some cost, it is constantly threatened by the demands of parking or building expansion. The typical result is that the long term master plan is not followed but, instead, becomes a complex overlay of successive plans plagued by growth and cross purpose (Turner,1984).

University Parking: Problems and Solutions

Three major problems related to parking have resulted from the increasing use of automobiles by students as well as university employees (faculty and staff). These were described by Wilbur Smith (1983) as follows:

1. Preference by staff, students and visitors for a direct route through the campus to their destination.
2. Large amounts of space consumed by parking lots.
3. An overspill of cars from the campus which conflicts with neighborhood uses and with the symbolic image of the campus.

Turner (1984) and Dober (1984) have emphasized the importance of the automobile as a factor in post-war campus planning. Universities have approached the parking problem in several different ways. Early parking plans were similar to a strip commercial development with a linear arrangement of buildings and parking lots along a road. A later concept in some new campuses utilized a plan in which the pedestrian heart of the campus was surrounded by a ring road and external parking lots. In some cases, older campuses with this arrangement enlarged their perimeter roads and parking lots to accommodate the increased numbers of cars (Turner, 1984; Laurie, 1967, 1984; Landscape Architecture, 1968). The aesthetic desirability of one such arrangement was recognized by an ASLA award in 1967 (Laurie, 1967); this plan located parking lots below the crest of a foothill

while the acres of asphalt parking spaces were spread through a landscaped setting heavily planted with trees in the parking lot medians.

Other university approaches to solving the parking problem have attempted to limit the number of vehicles permitted on-campus. Preferential parking treatment for vehicles used in car or van pools is one method which has been used to effect a reduction in the number of cars while a monorail transportation system has been used at one university for the same purpose (W. Smith,1983; Adamson, 1968). Extreme measures to which universities may be driven in attempts to ameliorate their parking problems include underground garages, fringe area parking with shuttlebus transportation to the campus center, high parking permit fees, rationing of parking permits according to lot location and prohibition of student use of cars on campus (Lynch and Hack, 1984).

The problem of spillover of cars from a campus to surrounding streets is a very real one when desirable campus parking is limited. Several cities have implemented programs designated as residential parking permit programs (RPPP) to reduce long term commuter parking in residential areas adjacent to university campuses. It is evident that while this action by a city does not solve the campus parking problem it does alleviate the city's problem of parking near a campus. Joint efforts of city and campus security personnel may be required to enforce provisions of the RPPP (T. Smith, 1983).

Parking Lot Design

It is clear that provision for automobile parking has become a significant aspect of university long term planning. Therefore, the design of parking areas has assumed greater importance to university planners.

Parking lot design has been the subject of many textbooks. The majority of these, however, primarily emphasize engineering considerations. Stall dimensions and angles, module size, design vehicle dimensions, turning radius constraints and traffic directional layouts are topics typically considered in parking lot design. Since in many parking lot

designs the primary concern is to maximize the number of parking spaces with a minimum of cost, the design favors motorists over pedestrian safety; amenities and aesthetics are usually not addressed (Corwin, 1978). A few of the older texts devote an occasional chapter to amenities and landscaping, but the discussions are concerned chiefly with topics such as keeping sight triangles open or safe location of curb cuts in relation to street intersections.

More recent texts have increased their coverage of landscaping and other amenities in parking lots and structures and include topics such as lighting, passenger shelters, public telephones, pedestrian circulation and access, signage and security as well as use of trees and other landscaping features (Baker and Funaro, 1958; Weant, 1978; W. Smith, 1983; Aronson and Homburger, 1983; Parking Consultants Council, 1983; International Council of Shopping Centers, 1984). Even though these texts are concerned primarily with engineering aspects of parking area design, inclusion of some consideration of landscaping and amenities reflects to some degree a change in the public's attitude toward parking.

The Landscape Architect as Parking Lot Designer

A common misconception by the general public is that landscape architects are concerned only with the design of planting plans for landscaping residential or business properties utilizing flowers, shrubs and trees. In fact, the professional landscape architect is uniquely qualified to produce designs for the entirety of outdoor space. Such designs may include not only the selection and placement of plant materials but also the layout of sidewalks, paths, patios, outbuildings and bridges across streams. Where appropriate, parking lots are also included in the overall site design (Rutledge, 1971; Yost,1987; Vollmer Associates, 1965). Parking lot design as a discipline of landscape architecture is formally described in Rules and Regulations, 1988, Board of Governors of the Licensed Architects and Landscape Architects of Oklahoma.

Parking lots designed by landscape architects have the usual requirements of maximum capacity and minimum cost as well as adherence to state codes and city codes providing for health, safety and welfare of the general public (Walker, 1986; Nelischer 1985; DeChiara, 1984; Parking Consultants Council, 1983; Landphair, 1979). Additionally, landscape architects are ethically bound to consider and to provide, as far as possible, aesthetic treatment and other amenities for the parking lots they design (Alexander, 1947).

The landscape architect is trained to address many aspects of parking lot design in addition to the engineering requirements and vehicle circulation within a parking lot. Among these additional considerations are the following: 1) improvement of user's comfort through mitigation of adverse effects of man's manipulation of the environment (i.e. acres of paving); 2) provision of safe and pleasant pedestrian circulation within the lot with logical connections to the user's destination; 3) location of loading zones, loading docks and dumpsters as well as proper interfacing of the lot with the entry of the building it serves (Landphair and Klatt, 1979; Booth, 1983; Simonds, 1983; Laurie, 1986; Meehan, 1986).

Landscaping Requirements and Regulation in Parking Lots

Until recently the general public perception of parking lots could be described as recognition of these facilities as unattractive but necessary. However, a general broadening of outlook through travel and education has increased public awareness of the existence of well-designed attractive parking facilities. This has resulted in an increased interest in promoting aesthetic treatment of parking lots through landscaping and in regulations or ordinances to ensure that aesthetic requirements are met. One the earliest efforts concerned with improvement of the appearance of parking lots was provided by the American Society of Planning Officials in their 1964 report, Parking Lot Aesthetics PAS No. 190. This report was concerned primarily with means of making parking lots more

attractive by regulation of their size, placement and design. More recently the same organization published a follow-up report by Corwin (1978) titled Parking Lot Landscaping PAS No.335. This report emphasized ways in which function and appearance of parking lots could be improved by requiring landscaping. Justification for imposing landscaping requirements together with appropriate regulations included enhancement of the visual environment, promotion of public safety, moderation of climatic effects produced by parking lots (heat, wind), and minimization of nuisances, primarily noise and glare. Corwin also called attention to the need for more discussion of parking lot landscaping because of the necessity for new types of regulations and revision of older ones if environmental and energy-conscious goals were to be realized. Administrative and legal problems attending increased use of landscaping materials were reported to be subjects requiring further examination.

The proliferation of ordinances by local governments concerned with upgrading the appearance of parking areas and improving the relationships between parking structures and surrounding buildings and activities is evident in an article titled "Aesthetics of Parking Lots and Parking Structures" published in the September 1986 issue of Zoning News (American Planning Association, 1986). Nearly 300 ordinances were included in the survey. Each represented a comprehensive and detailed approach to landscaping and other means of improving the aesthetics of parking lots and parking structures. The ordinances surveyed were judged to be effective by the local planners who administered them.

An example of ordinances surveyed is the comprehensive landscaping ordinance termed the buffer yard system also described in Performance Zoning by Kendig (1986). In contrast to conventional zoning which solves land-use conflicts by requiring separation of land uses into distinct zoning districts, the buffer yard system allows greater mixing of land uses. This is accomplished by use of 'buffer yards' between areas of different land use. These buffer yards may vary in size and treatment with wide setbacks of unimproved

land or turf requiring little further treatment while narrow buffer strips may require masonry walls, trees, or more extensive landscaping. The levels of required buffering may differ from one community to another. Yakima County, CA codes specify three levels while those of Colorado Springs, CO require only two. In any case the codes define precisely the amount of landscaping and the design and include specifications such as width of planting beds, required density of trees and the design of hedges, berms and other screens.

Other ordinances cited in the Zoning News article illustrate a new trend in local codes, particularly in the warmer climates of California and Florida. Several communities in both states have passed ordinances requiring shade trees as a part of the landscaping of parking lots. The Sacramento, CA code requires planting of trees such that a minimum of 50 percent of the lot will be covered within 15 years. The parking lot ordinance of Irvine, CA requires one 15-gallon canopy-type tree be provided for every four uncovered parking spaces while the codes of both Modesto and Redding, CA require one shade tree for every 6 to 10 parking spaces. These codes not only specify tree requirements but also provide for protection of the trees by curbing and distribution of the trees in such a way as to break up the paved surface areas and ensure that the trees reduce heat gain in the lot. In Florida the preservation of existing trees is encouraged in the codes of several communities including Coral Gables, Greenacres City, Vero Beach and Palm Beach. The strong local ordinance in Orlando, FL declares trees a public natural resource and makes it unlawful to cut down, damage or otherwise destroy a tree protected by or required by the code. Developers are awarded points for tree planting and preservation with extra points for the preservation of larger shade trees (APA 1986).

As might be expected for any ordinance, some oppose landscaping ordinances requiring shade trees in parking lots. Damage to the finish of cars resulting from droppings from birds perching or roosting in the required trees is a frequent cause for complaint. Automobile dealers with many cars exhibited on their parking lots frequently

oppose such ordinances and commonly attribute damage and loss of sales appeal to bird droppings (personal interviews with Bryan Brown, City Planner, and John Wesley, Director, Community Development Department, City of Stillwater, Oklahoma, 1987). Such complaints have led many communities to relax landscape standards for car dealer display lots. On the other hand, some dealers have used shade trees successfully in their lots; one dealer specializing in luxury foreign cars in San Antonio, Texas found that the upscale setting provided by the many large, mature trees on his display lot actually increased the sales appeal of his automobiles (Youtz, 1979).

If ordinances are to be effective they must be enforced. The typical punishment for violation of a landscaping ordinance is a fine. However, this may not be a very effective means of enforcement if the fine is less than the cost of landscaping in accordance with the ordinance. A more effective incentive for adhering to such ordinances is refusal by a city inspector to issue a Building Permit and withholding issuance of a Certificate of Occupancy until all features called for in the landscape plan (plants, benches, lighting, etc.) are installed. Several cities--Dallas, Austin, Atlanta, New Orleans--employ landscape architects and similarly qualified professionals to make certain that a landscaping plan is followed. Unfortunately this is not the case for many cities, and many individuals charged with checking on compliance with ordinances are not qualified. "Our inspectors probably couldn't tell a Cedar Elm from a Pin Oak or a Crape Myrtle", admits one city administrator (Yost, 1987).

Safety and Security in Parking Facilities

Personal safety and security for users of parking facilities is an important feature in the design of parking structures or parking lots. These concerns are particularly relevant to parking garages. Newman (1972) reported that theft and vandalism are common problems in all enclosed residential garages not employing attendants, while McKenzie and McKenzie (1978) described elevators and corridors of unguarded highrise buildings

and parking garages as the least secure urban spaces. The importance of incorporating security considerations into the design of parking garages rather than being added on to existing structures was stressed by Hunnicutt (1980) who pointed out that bad architecture and bad functional design make it almost impossible to provide proper security. Changes in design which increase safety and security for parking garage users were summarized by W. Smith (1983) and included such features as greater use of closed circuit television surveillance, security fencing on ground levels and greater use of open stairs and glassed-walled elevators.

Security problems are not as great for surface parking lots as for garages, but this does not mean that security should be ignored in parking lot design. Surveillance of parking lots from nearby streets and pedestrian sidewalks provides a rather simple but important security measure as pointed out by Jacobs (1961) and Newman (1972). Aronson and Homburger (1983) emphasized the importance of good lighting in lots where cars may be left for long periods of time. Well maintained landscaping of parking lots were reported to give lot users a greater feeling of security than would be the case for an obviously untended parking lot of gravel or broken pavement. However, the landscaping features should not overlook the need to maintain clear sight lines into the parking lot.

Trees and Their Uses in Landscaping

Despite the reported decline in landscape aesthetics due to development of flat,tree-removed, bulldozed residential subdivisions of minimum lot size with more utility poles and wires (Owens,1959), the overwhelming sentiment expressed in literature on the subject is pro-tree. This attitude was characterized by Stevenson (1957) who pointed out that, over thousands of years, trees have been a large part of man's natural environment. It should be expected that he should still get pleasure from the inclusion of as much natural environment as possible (in the form of trees) in the midst of the artificial environment he has created. In Stevenson's words, "The forms created by stem, branches, and leaf

masses; the sound of wind blowing through foliage; the sight and odor of blossoms -- all appeal pleasantly to our senses". This sentiment was expressed a little differently by Youtz (1979) with the simple statement that "trees are good companions for human beings".

Trees and Campus Image

The desirability of shade trees as an element of the campus image and its subsequent association with stability and the established order of things has been discussed in three recent articles (Lettieri, 1986;Laurie,1986; Karson, 1987). Examples of the impact of the loss of mature trees on campuses were given by Dober (1963) and Miller (1976). Dober described the loss of the great elms on the campus of the University of Illinois as a result of Dutch elm disease infection. He also indicated that younger universities aspiring to status were demanding plantings of mature trees to enhance their images. Miller described in great detail the loss of more than eighty percent of the trees and other plantings on the campus of Hanover College near Madison, Indiana as a result of a tornado in 1974. The importance of the plantings to that college was emphasized by the fact that through insurance funds (about 8 million dollars) together with college budgeted funds ($500,000) over 1,800 trees and 3,300 shrubs were planted as replacements during the autumn of 1974 and spring of 1975.

The Street Tree: A Brief History

Because many of the characteristics and uses of the street tree are applicable to the landscaping of parking lots, a brief summary of the history of the street tree is appropriate. The practice of planting street and urban trees was brought to America by the early colonists, and the fashion of their use has had cycles of popularity in the United States since that time. However, the history of the street tree dates to a much earlier time and was the subject of an article titled "English Avenues" published in Landscape Architecture

in 1949 (Ward, 1949). The extensive excerpts quoted here demonstrate how street tree plantings have withstood the test of time.

England's greatest avenue-planting age was roughly from 1660 to 1740, and any trees other than oaks and yews planted within this period are likely to be fully mature or overmature today. At least one of Britain's surviving avenues of lindens -- that at Buxted --was planted as early as 1630, but there seems little doubt that the widespread taste for avenues came from the Continent where linden avenues became especially fashionable in the time of Louis XIV (1643-1715). Most of the long avenues of England, such as the avenue of elms in Blenheim Park, were a part of the older tradition of gardening founded on straight lines and geometry and executed on a grand scale.

During the second quarter of the eighteenth century, the newer school of irregular landscape gardening came into favor with William Kent as the leader. Among the supporters of the new fashion were Pope, the writer, and Hogarth, the painter; and the ultimate chief executive or executioner was 'Capability' Brown. Nature was said to abhor a straight line, and Brown accordingly slaughtered straight avenues by the dozen. However, fair numbers of avenues survived the assault. There are still pre-Brown avenues at Hampton Court, where Brown was in charge for a time. A generation or two after Brown's death in 1783, there was some reaction. Lombardy poplars appeared and won favor, and Sequoia gigantea was introduced under the popular name of Wellingtonia. Notable avenues of both of these trees, and of some others, were planted in early Victorian times. Today almost any well-grown avenue whether straight or serpentine, is likely to be admired by the general public (Ward, 1949).

Advantages of Street Trees

The advantages of street trees through modification of the micro climate as well as their pleasing aesthetic contributions have been recognized by many authors. Stevenson (1957) assigned first importance to the protection afforded from direct and reflected heat

and glare of the sun in warm weather while the resulting improvement in the appearance of a street was rated as a second but also important contribution of street trees. Eckbo (1959) described trees as nature's air-conditioners which moderate the climate by reducing extremes of heat, wind, aridity and glare while also moderating the visual landscape. Referring to large trees in general, Bach (1971) enumerated several benefits resulting from the ability of large trees to reduce artificially high temperatures in the urban "heat island" caused by absorption and storage of heat in building materials and radiation from the polluted atmosphere. Beneficial effects listed were the following: reduction of loads on air-conditioners and decreased demands for power as a result of lower air temperatures, decreased automobile overheating and gasoline evaporation from gas tanks, dramatic reduction of particulate matter in the air and general reduction of pollutants. Additional descriptions of the effect of tree plantings on the atmosphere have been reported by Marshall (1972) who suggested that planting trees along traffic corridors would contribute significantly to reduction of atmospheric pollution at the site of its production. Sullivan (1977) pointed out that increasing levels of carbon dioxide in the air could be partially counteracted by increasing vegetative leaf area.

The retention of a phenomenal human quality in densely populated cities of China was directly attributed by Schach (1979) to their street tree plantings. He further suggested that the United States would do well to request assistance from the Chinese in establishing guidelines for street tree planting programs. A similar observation was made by Ellis (personal notes, 1985) during a ten-week tour of the People's Republic of China by the China Study Group from the OSU School of Architecture.

Although evaluation of tree plantings in terms of dollar value has been attempted only infrequently, some efforts in this direction have been made. One report (International Shade Tree Conference, 1965) estimated the discounted aesthetic shade tree value to be about $6.00 per square inch of trunk cross-section and equated a tree's cooling effect to 10 room-sized air conditioners operating 20 hours a day. A later estimate (Landscape

Architecture Magazine, 1972) calculated the discounted aesthetic value of a shade tree to be $1.00 per year per square inch of trunk cross section while its cooling effect was calculated to be about $4.00 per year per square inch of trunk cross section. Even though these are only estimates, they offer a measure of the value of shade trees.

A discussion of street tree plantings would be incomplete without pointing out that, although the vast majority of literature on the subject has been favorable, this sentiment has not been unanimous. Objections to such plantings are typified by early comments by Colvin (1948) and by Cornell (1959). These authors described the effect of evenly spaced trees on fast moving traffic along a street or highway as a flickering or rhythmic blur which may cause eyestrain and is physically tiring, monotonous and sometimes even hypnotic. These factors were considered to be hazards to safe driving.

Designing with Trees

The use of trees as a major element in the design of outdoor space was described and illustrated in great detail by Arnold (1980) in his book, Trees in Urban Design. Numerous photographs of existing trees along streets and in parking lots supported his advocacy of this use of trees in landscape design. His discussion of design principles include both physical and abstract components, and he recommended the architectural use of trees in strong design statements, strong lines and massing. He also recommended and defended monoculture of trees in the urban environment. The basic principles advocated by Arnold are supported by other designers including Pitkin (1964), Stevenson (1957), Muirhead (1959), Stelling (1948) and Cornell (1965), Zion (1968), Carpenter (1975), Austin (1982), Hudak (1980), Zavarell (1975).

Several factors must be considered in the use of trees in a landscape design. These include: 1) Adaptability to the environment; 2) mature size, form and appearance; and 3) size of tree to be planted.

1) The importance of using plant material adapted to the area in which they are to be grown was well described by Huntsman-Trout (1965) in Designing with Trees. He stated that the character of the landscape can be controlled and typed by the plants hardy to the region. He emphasized the point that the use of plants unsuited to an environment may be just as disastrous to a design as would be the failure to select those with satisfactory qualities of form and appearance.

2) The importance of selection of tree type based on mature size and form was described by Stevenson (1957). As an example of bad design, he considered the use of miniature trees planted along a main traffic artery. As street trees their lowest branches would need to be of sufficient height to clear both pedestrian and vehicular traffic--probably about fifteen feet. However, if the normal ultimate height of the tree were only twenty to twenty-five feet, only five to ten feet would be left for development of the top. Such trees might resemble feather dusters, certainly an undesirable effect. Clearly, consideration of pedestrian and vehicular traffic must be given in the choice of trees for use in parking lot design as well in selection of trees as street trees.

3) The age and size of a tree at transplanting are not fixed but may vary from project to project. The budget for trees may limit the transplant size to a great extent. However, the invention of the mechanical tree spade has reduced the labor costs of acquiring and transplanting large size trees (Caffrey, M. G., Director, Greater Oklahoma City Tree Bank, 1988, Report presented to Oklahoma Horticultural Society, January, 1988). With modern techniques, almost any size tree can be successfully transplanted (Zion, 1968; Arnold, 1980; Jewel, 1981).

The importance of careful consideration of tree size is very well described in an article entitled "Tree planting reconsidered: an argument for big transplants" (Landscape Architecture Magazine, 1972). The author advocated a change in the way trees are normally (usually) planted in connection with new building construction. The following quotation from this article clearly illustrates his point.

> "To demonstrate the short-sightedness of planting young trees, trees living 75 to 150 years mature in about 35 years. Life spans of most structures are approximately 50 years. Under present development practices, sites are cleared first and then landscaped with trees usually 5 - 10 years old. By the time the trees have matured, the building is half-obsolete. If the site is renewed, the big trees are cut, young planted again, and the out-of-sync life cycle begins again."

Post-occupancy Evaluation: Theories and Characteristics

The term, post-occupancy evaluation (POE) , is almost self-defining. Although POE has been defined in various ways, the definition offered by Zimring(1980) is probably the most straightforward. He defined the term as simply "the examination of the effectiveness of designed environments for human users". Later, Zimring (1987) characterized three basic goals of POEs: (1) to obtain as much information as possible about a specific setting (its history, structure, specific users and so on), (2) to be able to extend results as accurately as possible to some larger category of settings, users or times, and (3) to produce new information with precision such that statements of research outcomes will be as unambiguous as possible in order to discount plausible alternative explanations.

Zimring (1987) further characterized POE research in terms of three traditions: (1) giving a voice to the user; (2) researching theoretical questions; and (3) affecting decision making. The first, that of giving a voice to the user, is characterized by gathering and representing the views of the non-paying users such as rental tenants or office workers. Users' attitudes and satisfaction levels are surveyed through the use of interviews and questionnaires. The second tradition, researching theoretical questions, is characterized by exploring conceptual issues such as way-finding or environmental stress. POEs conducted under this tradition often reflected a desire to make tight, unequivocal, scientific arguments and used field experiments in which the evaluator had as much control as possible. The third tradition of POE research is concerned with assisting an organization in making decisions about settings or people. These decisions often involve fine-tuning an existing building or facility after organizational needs have changed. The

evaluators are often strongly influenced by practices of organizational development; rather than focusing on scientific arguments they attempt to create a situation in which both users of the setting and environmental decision makers feel that they are participating and that their needs are represented. Evaluators following this tradition of POE use interviews and walk throughs instead of using standardized, controlled methods.

Post occupancy evaluations have shown a wide range in scale, resources, goals and methods, but most have had several principal phases in common. Five of these were identified by Zimring as follows: (1) entry and initial data collection; (2) designing the research; (3) actual data collection; (4) analysis of data; (5) presentation of information. The phases have seldom been linear and often a number of formal or informal feedback loops have occurred.

Initial exploration of the setting and development of a working relationship with the client has been the primary purpose of Phase 1 of POEs. Friedmann et al. (1978) identified five requisite components of the initial phase of any POE. These included the setting, the users, the neighborhood or physical context, the design and space management activity and the social-historical context.

The first of these components, setting, was defined as the project being evaluated. This encompassed the physical and social aspects of the overall design, relevant materials, ambient qualities (heat, light, noise), elements with symbolic value for users, conditions of temporary and permanent elements including maintenance, and finally, organizational goals, needs and communication patterns. The second component, users, was defined as the people who directly or indirectly use the setting being evaluated. Friedmann pointed out that since users frequently lacked access to the people actually contracting for the POE, it has usually been considered important in a POE to describe the users and their needs, perceptions and activities.

The third component of Phase 1 as identified by Friedmann, neighborhood and physical context, included terrain and climate as well as land uses and architectural styles

of the project surroundings. The fourth component, design and space management, was defined as referring to changes made by users after the completion of the project. Such changes may have indicated changed needs or post hoc efforts to compensate for cases in which perceptions and values of designers or other decision makers were incongruent with those of the users. This component was identified as the single most ignored aspect of environmental design evaluation to date. The explanation given for this was that the designer was only one of the actors in a complex process that involved the client, users, financiers, boards and committees, public officials and agency representatives, space managers and others.

The last phase 1 component discussed by Friedmann, social-historical context, was defined as including the social and physical changes affecting the project.

Finally, with respect to the initial aspects of a POE (phase 1) Zimring (1987) suggested that the researcher pose the following questions before proceeding to phase 2:

1. Have all people at all levels of authority who might affect the project been contacted?
2. Have the benefits of the project been explained?
3. Have appropriate endorsements been secured?
4. Has a framework for data gathering been developed?
5. Has a general picture of the designed setting been established?

In phase 2, designing the research, most POEs have employed a combination of data gathering techniques, several methods being used more commonly than others (Zimring 1987). Those most frequently employed have been questionnaires, interviews, photography, time-lapse photography, video tape recordings, and direct on-site inspections or some other type of physical survey. Interviews and questionnaires have proved especially valuable because respondents could be asked about the motives and rationales for their actions; but, interviews have been limited by the respondents' skills or interest in discussing their feelings, by lapses of memory and by a desire to appear

intelligent, rational or "with it". By contrast, methods such as direct observation or measurement of traces left by users (i.e.signs of wear and tear) have been considered to be less affected by the respondents' perceptions, memories or worries. However, evaluators using observation to evaluate "internal" states have encountered interpretation difficulty because subjective feelings such as satisfaction or dissatisfaction are difficult to observe or measure.

POEs in general are characterized by several common features: (1) they tend to focus on a single type of building or other designed setting such as a public plaza, (2) evaluators tend to describe rather than manipulate a setting; (3) the work is almost always conducted in actual settings rather than in the laboratory. Post occupancy evaluations exhibit considerable diversity in how they are conducted, what the evaluators hope to achieve, and the way resulting information is used.

CHAPTER III

METHODOLOGY

The post occupancy evaluation of OSU parking lots was conducted over a period of fourteen months and covered many aspects of parking lot design. The evaluation was conducted in terms of Phases I through V as described in the literature review pertaining to POEs. Included in the evaluation were such considerations as function, use, control, maintenance, vehicular circulation, pedestrian circulation, internal service areas, signage, amenities and overall aesthetic impact. The evaluation included on-site inspections of each of the 122 lots serving the campus and was documented by over 600 photographs and more than 14 hours of video tape. In addition, interviews were conducted with as many as possible of the Oklahoma State University administrators and staff identified as having any involvement with different aspects of campus parking lot design, regulation or maintenance. Information from all these sources was summarized in a data base.

Phase I: Entry and Initial Data Collection

The first step taken toward the POE study of parking at OSU was to gain personal interviews with key university administrators. These interviews were conducted initially with the support of a recording device. Follow up interviews were conducted both over the telephone and in person but with no recording device. The interviews were not structured but were question and answer oriented. Usually after a few introductory remarks concerning the purpose of the study, the person was simply invited to discuss his involvement with campus parking facilities. Interviews were initially limited to 15 to 30 minutes. A few key administrators with considerable responsibilities toward parking

required several interview sessions to relay the information they felt would help with the prehistory and the administrative framework.

Notes from the interviews were typed as soon as possible after each session. Drawings, maps, booklets, and other memos, documents and publications were frequently offered by the person interviewed either voluntarily or at the request of the evaluator. A Macintosh Plus computer using the data-base program, Jazz, was used to assemble the various types of information from all those sources in a comprehensive data base. Initially this information was a composite of data provided by different agencies and extracted from various pamphlets, maps, and documents. It was later expanded to include data gathered from on-site inspections and the photographic survey.

To summarize, in Phase I the prehistory of the project and the initial setting were explored, a working relationship and an understanding of their needs and perspectives was developed with OSU officials involved in parking programs, and endorsement for the study was obtained.

Phase II: Designing the Research

During Phase II the specifics of the project such as strategy, sampling, and choosing and developing research designs and methods were undertaken. The most frequently employed techniques of data gathering for POEs have included questionnaires, interviews, photography, time lapse photography, video recordings, on-site surveys and direct observation. With this background knowledge, the following studies were initiated as prototypical examples of methods to evaluate conditions affecting parking lot function and design:

(1) a 12 hour video surveillance with time and date on each frame,

(2) a method to document walking times,

(3) a questionnaire to determine the lot location preference of faculty and staff in relation to office location and arrival and departure times,

(4) a video vegetative survey of several existing parking lots,

(5) on site inspections of as many of the parking facilities as possible.

1. The 12 hour video surveillance was the first prototypical study. Lot #48 located directly across the street from the north wing of Agricultural Hall was chosen because it could be observed from a convenient location which was also a safe location for the video equipment. The study was also designed to record the ad hoc uses of the lot which could suggest other enhancements as well. The study was conducted from 7 am to 7 pm on a Monday in September, 1987.

2. Because proximity to destination is a major criterion of parking satisfaction and because the CDC proposed that all parking facilities be located within a 5 to 7 minute walk of the library, a reliable method to document walking times was considered important to this POE of campus parking. The objective was to discover a simple way to document walking times from various points on campus without having to punch a stopwatch and record data with paper and pencil. Such a procedure was developed by using a video camcorder coupled to a character generator which recorded elapsed time on each frame. The video tape was reviewed and prominent landmarks were indexed according to the recorded elapsed time. The information was then entered in a data base. From recorded data base information various point-to-point times could be calculated.

3. A questionnaire designed to compare user lot preference with building location was developed and pre-tested on the faculty and staff in the Horticulture and Landscape Architecture Department. The results of this questionnaire were presented to a departmental seminar in February of 1988. The questionnaire was developed with the intent of ultimately determining a building census as well as providing user preference data. These data could be used by the administration to rectify apparent mismatches between parking allocation for faculty and staff and students living in nearby resident halls.

4. A vegetative inventory was recorded on video tape for several parking lots having trees in the medians. The main purpose of the video survey was to record the branching patterns and level above ground of the median trees.

5 On-site surveys were conducted to assess the physical conditions of the parking lots. These were documented by numerous photographs and by entries in the comprehensive parking lot data base. In addition to the information in the data base from other sources, the on-site inspection provided the following information categories: type of permit required (legal user), parking meters, pay lot with booth, handicapped spaces, dumpsters, loading docks, loading zones, 15-minute loading zones, in-street parking spaces, pavement type, painted stripe condition, stall angle, perimeter curb condition, median condition, vegetation in median, lighting, direct street access or access through another lot, and control of access by gates, chains or manned booth.

The photographic surveys were designed to document the physical conditions in the lot as well as the visual impact of the lots. These photographs were taken over the course of 14 months from April 1987 to June 1988. Interior and exterior views from several different vantage points were taken. Each view was captioned and referenced. This entire collection of photos has been made available by the evaluator to persons desiring to conduct further studies of OSU parking lot conditions.

Highlights from the on-site inspections and the photographic survey were presented to a departmental seminar in April, 1988.

Phases III through V

Phase III, Collecting Data, and Phase IV, Analyzing the Data, are discussed in Chapter IV, The Findings. Phase V, Presenting the Data, is discussed in Chapter V, Conclusions and Recommendations.

Summary

A survey of campus parking facilities at OSU was conducted as a post-occupancy evaluation (POE). The purpose of this POE was to assemble information detailing the administration of parking at OSU, to characterize the parking facilities and identify problems related to them and to recommend enhancements which would remedy some of those problems. The intention was that problems revealed by the POE would be addressed by solutions suggested by the same POE. The studies developed were aimed at these goals. As the studies progressed some were eliminated after an initial trial when it became apparent that the time required to carry them further would be excessive. As data were accumulated during the course of these studies numerous recurring problems were identified. Late in the data collection process it was decided to limit the recommendations for enhancements to specific problems in three existing lots with some of the more general problems encountered elsewhere receiving only brief mention. Thus, the remaining focus of the POE addressed the visual quality of the parking facilities. Studies to evaluate other aspects of campus parking facilities are recommended to others for further study.

In summary, a post-occupancy evaluation of OSU's parking lots was conducted on two levels: macro and micro. The macro level examined the relationship of campus parking to OSU's current campus master plan (CDC). The micro level examined site specific conditions of individual lots, but the investigation went further than just site specific information. The POE also examined university policy and its effects on parking lot design, safety, location, regulation, and maintenance. Based on the information and insight gained from the POE, enhanced landscape designs for three representative parking lots were developed.

CHAPTER IV

FINDINGS

Because of the diversity of the kinds of information gathered during the post-occupancy evaluation of parking on the OSU campus, the findings are reported under three general topics: 1) Information based on personal interviews and documents related to parking, 2) findings from on-site inspections, and 3) the relationship among the CDC, the temporary lot phenomenon and the present condition.

Information Based on Personal Interviews and Documents Relating to Parking

Current Administration of Parking at Oklahoma State University.

Campus parking at OSU is influenced and/or regulated by a number of different advisory and administrative agencies. While some of these are officially charged with parking administration, others are engaged in this activity as a function secondary to their main charge. Some committees and agencies affect parking only in indirect ways.

Campus Committees Officially Charged with Parking Administration

Officially there are two main committees and a third, the appeals committee, which have functions concerning parking as their primary responsibility. These are as follows:

1. The Long Term Traffic and Parking Planning Committee
2. The Traffic and Parking Rules and Regulations Committee

3. The Parking Appeals Committee

The Long Term Traffic and Parking Planning Committee is a committee which deals with forecasts and long term planning. The committee is appointed by and reports directly to the President of OSU. This committee has nine members and is composed of faculty (including the President of the Faculty Council), students (including the Presidents of the Student Government Association, the Off Campus Student Association, and the Resident Hall Association), and professional staff from Campus Security, Architectural Services, and Grounds and Labor (Personal interview Mr. Everett Eaton, OSU Chief of Campus Security and Parking, Summer 1987, Fall 1987, Spring 1988).

The Traffic and Parking Rules and Regulations Committee is a nuts and bolts committee which sets fines and charges for permits and establishes the day to day rules. The committee members are appointed by the President but report directly to the O.S.U Vice-President of Business and Finance. It is composed of faculty, staff, and students (Eaton, 1987).

The Parking Appeals Committee is a body that hears and rules on appeals of tickets written by OSU campus police officers (Eaton, 1987). Members are appointed by the OSU President.

The foregoing are the major boards providing policy and guidelines for parking on the OSU campus. A broad representation of all campus interests exists on these boards, but the power to affect the direction of parking planning may shift from one group to another. The creation and implementation of long term plans have often reflected the interests of the chairman of a committee and the relative power of its different factions. For example, a shift in the ratio of staff spaces to dormitory resident spaces will probably occur in the near future because the Vice-President of Business and Finance has recently been replaced by the Vice-President of Student Affairs on the Traffic and Parking Rules and Regulations Committee (Beer, 1988). Long term planning and implementation is, in large measure, affected by the composition of such boards, the power their different factions may exert

and by the sphere of influence of their chairmen. This phenomena alone could be the topic of another study.

Other Agencies or Committees Involved in Campus Parking

In addition to the three official committees, there are several other campus agencies involved in parking in various ways. These include the following: Parking and Security Department, Architectural Services Department, Grounds and Labor Department, Athletic Department, and finally, the Student Union Hotel.

The OSU Parking and Security Department (commonly called the Campus Police) plans and enforces the physical aspects of parking regulation and traffic on the OSU campus. Campus parking is approached with the following guidelines: convenience, compliance and control. All vehicles used on campus are required to register with this office. A booklet of the campus parking rules and regulations is published each year with a color coded map that delineates the various parking lots by user permit. This map is sometimes reissued during the second semester if large changes in parking have occurred. The 1985, 1987, and 1988 parking maps have been provided as Plates 1, 2, and 3 located in a pocket at the back of this thesis.

In addition to enforcement activities, the Campus Police Department keeps a computerized record of the number of parking permits issued by type as well as the number of parking spaces available so that the allocation of parking may reflect the relative size of user groups (see Appendix A). It also tracks the number of spaces lost in lots where parking is closed due to construction, maintenance, etc. Typically there are more parking permits issued than actual parking spaces on campus. This frequently results in large numbers of registered permit holders seeking parking places at any given time and causes what is termed "parking pressure" on the campus during the period from 8 am to 5 pm. Parking pressure is greatest on Mondays and Wednesdays and least on Fridays. It also exists during the evening because of evening classes and library hours. Enforcement of lot

allocation is suspended after 5:00 pm, so faculty and staff have experienced parking pressure in the evening as students have taken choice spaces near classrooms and libraries.

The department also conducts numerous surveys and gathers extensive data on all aspects of parking in order to make the allocation of parking spaces as fair as possible. However, many decisions made are admittedly arbitrary because available data of the kind needed to make them in any other way is insufficient. One type of information requested by the evaluator during the interviews was a breakdown of parking lot accidents by lot number (personal interviews with Eaton and Moser, 1987; 1988). This information was requested for both personal injury and property damage accidents. Because a landscape architect is charged with providing for the health, welfare and safety of the public, the collection of such information should be a vital part of any POE of parking situations. From the time interviews were conducted until the termination of data collection, that information was not available. However, some of this information has since appeared graphically on a colored map displayed on the wall in the reception area of the Campus Security Office.

The OSU Architectural Services is another department involved directly in parking lot planning and design. OSU Architectural Services provides some but not all parking improvement construction and landscape drawings to other agencies on campus. Although it supervises and oversees construction by private companies who have bid competitively for the work, such construction supervision has not included installation of landscaping materials. This is because the university does its own landscape construction and installation through the Grounds and Labor Department. Architectural Services conducts no follow up inspections on landscape installations designed either in house or by consultants.

The OSU Grounds and Labor Department is responsible for the installation and maintenance of the overall campus landscape. They have been charged with implementing the planting plans drawn by Architectural Services and are allowed to change or modify

them as they are inclined. Architectural Services leaves landscape installation, control, and inspection solely to the Grounds and Labor Department (personal interviews Cobb, 1987; Allen, 1988).

The OSU Grounds and Labor Department has divided the campus into eight maintenance districts. Each district develops its own schemes for landscape improvements. For the most part these improvements do not extend to the respective parking lots within the maintenance districts (personal interview Burnett, 1988). Two recent exceptions to this policy are the addition in 1987 of new trees in the median of lot 80, a metered lot south of the Colvin Center, and the landscaping of interior lot 66 at the Vet. Med. Clinic in conjunction with new construction.

The OSU Athletic Department is another group having considerable input concerning parking lots on the OSU campus. This group regulates parking for OSU's athletic events. The football crowd generates the largest parking demand at OSU; a special group, the Posse Club, has been charged with handling the traffic and parking associated with football game days. This group is administered through the Athletic Department's Gift and Donation Program (Chesbro and Linville 1988). Evolving through trial and error over a period of more than thirty years, a highly sophisticated plan to regulate parking during football game days and other sporting events has been developed. This plan in its present state involves the coordination of a large group of volunteers and athletic department staff as well as law enforcement personnel from the OSU Campus Police Department, the Stillwater Police Department, the Payne County Sheriff's Department together with other law enforcement agencies across the state. The goal is the provision of safe parking and traffic control during home football games and other athletic events.

Because of the great numbers of parking spaces required during athletic events, the primary design criteria for most of the parking facilities in the area surrounding the football stadium, fieldhouse, and baseball stadium has been to provide the maximum number of

spaces available. Another reason for that design criteria is that each parking space represents a monetary donation to the Athletic Department (see Plate 4).

Aesthetics have not been considered to be of much importance in the overall design of parking lots associated with athletic events. Examples of this policy are parking lot 10 B east of Cordell Hall, parking lot 6 south of the football stadium and parking lot 94 near the baseball stadium, one of the most recently constructed lots on the campus. Lot 94 shares its use with nearby Bennett Hall residents. Photographs of these lots are included elsewhere in this chapter under discussion of findings of the on site inspections.

The last official administrative body controlling some aspect of parking on the OSU campus is the OSU Student Union which controls its associated Student Union Parking Garage, pay lot 20, and a surface lot across Hester Street to the east, pay lot 21. Both lots are also designated visitor parking lots. The Student Union has funding separate from the University's, and its maintenance is provided by a system different from that for the general campus. A on-site inspection of this facility revealed many problems. Photographs of these lots are included elsewhere in this chapter under discussion of findings of the on site inspections.

Agencies or Committees Having Indirect Influence
on Campus Parking

Parking is also affected by the actions of other committees and agencies whose purposes are not central to parking. One of these is the Campus Facilities Committee,a Faculty Council committee reporting to the President of the Faculty Council. In prior years its emphasis has been on buildings rather than parking lots. A second group is the Centennial Celebration Committee which is coordinating preparations for the Campus celebration of OSU's Centennial year. In addition to the publicity and celebrations connected with the centennial effort, the group is implementing a central campus beautification project. This effort has focused primarily on a set of planting plans

developed with the assistance of Grounds and Labor personnel for the area immediately to the south of Whitehurst Hall (the administration building) as well as some planting plans for the central mall south of the Library and west of the Student Union (Farley, 1988). The replacement of the overgrown arborvitae hedges with a dwarf variety and the planting of seasonal color change materials along the walkways of this area have been the main thrust of this effort. No attempts to enhance parking lots have been proposed. Finally, there is an official Campus Beautification Committee but it is currently inactive, not having met in three years.

In addition to the committees described above, some academic departments have undertaken the beautification of the grounds around their respective buildings either through expenditure of departmental funds or through funds donated by distinguished alumni expressly for that purpose. Some of these efforts included parking lot enhancement. One example is lot 66 in the Veterinary Medicine area. Another example is the the Beef Science facility located on state Highway 51 west of Stillwater. Professional landscape assistance was requested in the design of a ceremonial entry way with emphasis on street trees for their essentially treeless site. The incorporation of shade trees was specifically requested for the design in a large open field to be used for parking during certain livestock events. Donations from alumni were being sought to implement this plan.

Other allied campus agencies have enhanced their grounds and the associated parking through expenditure of their own funds or through alumni donations. A very extensive planting plan created for an independent campus agency with its own funding was prepared for the USDA-Agricultural Research Service as a demonstration project for the USDA's "Take Pride in America" promotion. The landscape planting plan included enhancement to parking areas as well as building entry embellishment and articulation of the facility's entrances from Western Avenue (Ellis, 1987). The OSU effort was selected to be the prototypical example for this project and has been publicized in a four state area.

Summary of Interviews

It is clearly apparent that the administration of parking policies on the OSU campus involves a rather large number of committees, agencies, and departments having direct or indirect influence on both the function and appearance of parking lots. Although it would seem that a coordinating agency overseeing the overall visual, aesthetic and functional effects of the efforts of these varied groups would be desirable, no such agency exists on the OSU campus at present.

The OSU Master Planning Documents

The Phillip A. Wilbur Plan of 1930 was the first official master plan. This plan developed vehicular circulation and parking within the campus core in a balanced, symmetrical fashion. The library was at the center of the campus with vehicular access to it was by means of U-shaped drives that penetrated the campus from the north and south. Additional streets provided vehicular access in an east-west direction from Monroe to Knoblock. The library was located in the center of a square and was surrounded by an access road and parking and then ringed by other buildings in a symmetrical fashion. The buildings in the first ring were encircled by yet another road with more buildings facing them from across the road. The secondary buildings were arranged in quadrangles such that one side of each building faced one of the surrounding streets and opposite sides of the building faced onto interior parking lots in the center of the quadrangles. Wilbur's campus plan was similar to many county seat town squares characterized by the courthouse in the center of a green square surrounded by a road and parking and ringed by other subordinate buildings. This plan envisioned changing the predominantly rural pedestrian agrarian OSU campus to a campus with provisions for accommodation of both pedestrian and automobile traffic. The plan included generous use of trees lining the streets and interior parking lots and vehicular access to all parts of the campus core.

Another master plan was designed in 1970 by Caudill, Rowlett, Scott, Inc. Although copies of that document could not be located, a small reproduction of the illustrative site plan was found included in subsequent master planning documents. The plan departs from the Wilbur plan in many ways; this was largely due to the rapid campus growth to support research programs related to World War II and to growth associated with veterans going to school on the G.I. Bill in the nineteen fifties. Many of the quonset huts on campus until recently dated back to that period. At the same time the physical boundaries of the campus were greatly extended by campus housing which had been provided for veterans and their young families.

In 1975 the OSU Department of Architectural Services designed its own master plan. This document itself was not available for study, but the large illustrative site plan which accompanied it is displayed on the wall of the conference room in the present Architectural Services Building.

In 1982, Sparks, Martin, Easterling/William Kessler and Associates proposed the most recent OSU planning document, OSU: Stillwater Campus Development Concepts. It is commonly referred to by the terms Campus Development Concepts, CDC, or Kessler Plan.

In the Fall Semester of 1984 an Urban Design class, Architecture 6117, conducted a study of the campus and produced in booklet form a report titled Circulation and Image of Oklahoma State University. Two supplemental looseleaf documents accompanied it : Entry Images, Gateways, and Edges and Landscape.

OSU Stillwater Campus Development Concepts, 1982

Campus Development Concepts (CDC) is the university's most recent master planning document. It was prepared by Sparks Martin Easterling/William Kessler and Associates, Inc. The purposes of this document were twofold: to establish the potential site for the 21st Century Center (now referred to as the Noble Research Center) and to provide a

logical physical framework for future growth. The planning effort was conducted during a three month time span. The proposed site for the new building had an immediate effect on parking because the site chosen was the intersection of Farm Road and Washington Street and included parking lot 30 and the east half of lot 29. This part of the CDC has been implemented; and, besides permanently displacing an established heavily traveled traffic route through campus and automobile access to the campus library, the building and its proposed landscaped north mall have eliminated more than 350 centrally located staff parking spaces.

It was stated in the CDC document on page 122 that there was a relatively high concentration of parking as well as an undesirable mix of pedestrian and vehicular traffic within the heart of the campus. The breakdown of the pedestrian oriented fabric of the University and the creation of both aesthetic and circulation problems were attributed to these factors. In its provisions for a logical framework for future growth, the CDC recommended the removal of large amounts of existing surface parking on campus in order to provide building sites for multistory parking garages and other future buildings as well as to create areas of greenspace within the campus.

The plan proposed the construction of five large parking garages accommodating 4,250 cars to replace about 3000 surface parking spaces lost by removal of surface lots within the campus. This represents a net gain of only 1,250 new parking spaces. According to figures in the CDC (p. 73), this would cost 26 million dollars (4,250 spaces at $6,000 per space). Parking space for an estimated 10,250 cars would be provided in surface lots outside the campus core but within a five to seven minute walk from the center of the campus.

Based on only two days observation of the parking situation at OSU, the CDC indicated that the campus was not large and that most areas were only 5 to 7 minutes walking distance from any commuter parking area. Although pedestrian amenities were proposed for the core area of campus, no amenities or standards for visual quality were

offered for the proposed mega surface lots. The cost of acquiring the land for surface lots to accommodate the bulk of the displaced cars was not addressed nor were the construction costs for each surface space.

Circulation and Image of Oklahoma State University, 1984

The stated objective of this student report, published in 1984, was "to provide the University Long Range Traffic and Parking Planning Committee with material which will give a clear picture of the present situation and propose a number of imaginative design concepts accompanied by design criteria and guidelines for the future development of the University." Although based to a large part on the CDC document, the Circulation and Images report varied from it as a result of changes occurring since 1982.

Comments with regard to parking from this report included the following:

1) Current on-street parking creates a visual barrier detracting from the campus image.
2) Central campus parking areas create conflicts for the greatest concentrations of pedestrians.
3) Large expanses of parking surfaces are unattractive and in areas of high temperature can be relieved by interspersing parking with planted areas .
4) In campus areas of highrise dorms and resident parking lots, pedestrian, automobile, and bicycle circulation routes through parking lots are not defined or separated.

The following recommendations for visual enhancement were offered in the Circulation and Image report :

1) Intensive implantations of deciduous trees along major circulation routes should be used to knit the campus together visually.

2) Deciduous trees should be used to create a processional element along major circulation paths. They would provide shade in summer but allow light to penetrate in the winter.
3) More planting is needed in parking areas to screen the masses of automobiles, shade the parked cars and cut down on reflected heat.
4) More trees need to be planted to shade buildings and reduce energy consumption.
5) Trees need to be planted in imagable patterns to define major activity areas.
6) A better scale-relationship between trees and buildings needs to be established.
7) Trees and plantings should be used as directional devices to reinforce vistas and vary spatial experiences along paths.

In the final section of the report guidelines were proposed for the phased implementation of its proposals. It recommended that the removal of campus core parking be implemented gradually for practical reasons and to acclimate students and staff.

The same architecture class produced two companion works in loose-leaf format. One, entitled "Landscape" (Hamlet, Reece, Stivers 1984) was a collection of photocopied excerpts from textbooks, photocopied brief informal notes taken during a few brief interviews, and photocopied black and white photos of OSU campus scenes superimposed with handwritten note cards upon which appeared a series of famous quotations in large letters followed by short, sarcastic one-liners in smaller letters. The placement of the notecards frequently obliterated the subject of the photo. The photograph used on the cover and as a divider for sections within the report was not from the OSU campus but from some European urban street scene.

The second companion 20-page loose-leaf report was entitled "Entry Images, Gateways, and Edges". Using a map photocopied from page 112 of the CDC as the basemap for all the concepts discussed, the report proposed locations for gateways, entries, edge conditions and routes of access. Gates seem to be where major decision points were

located for vehicles bound for the campus. However, such decision points were never defined as Gates in the Images report. Routes from major Stillwater highways and arterials to the campus were marked with large dots on the maps. Three points of entry into the main campus from ring roads were indicated by large dots and called Entry, although there are many more access points that were not identified. A brief discussion of each illustrated Gate and Entry was included. Reference was made to a Campus Redevelopment Committee. Other concepts such as campus edges were depicted on the same base maps. The results of an attempted windshield survey for land use were depicted. Pages were unnumbered and no authors were listed.

Examination of Codes That Regulate Parking Lot Design and Landscaping

A copy of the Stillwater Municipal Code pertaining to parking lot construction and landscaping was supplied to the investigator during the interview with Brian Brown, City Planner, Community Development Department, City of Stillwater, Oklahoma. The most important thing discovered is that the current city administration policy is one of nonenforcement of the code on any land zoned University use and shown as U on the city land use map. This policy applies to even small lots and parcels of university owned land within residential neighborhoods. Many such lots are scattered throughout the city. The city is currently attempting to rezone all parcels acquired by the university to the University Use (U) designation as soon after they are acquired as is possible (Personal Interview, John Wesley, Director, Community Development Department, City of Stillwater, Oklahoma, 1988).

Current university practice has disregarded the city's construction and design codes in several ways. For example, while city codes do not permit the construction of temporary parking lots, the university has constructed such temporary lots regularly. Another example is the city code requirement that parking lots be visually screened from residential

property adjoining a parking lot or across the street from a parking lot. The university has not screened its new lots and has even removed some heavy hedges that once screened some of the older lots.

The existence of standards for campus construction and landscaping campus parking lots were alluded to but could not be produced in written form by any one in authority (Eaton, 1987; Moser, 1988; Cobb, 1988; Allen, 1988; Farley, 1988). In the course of personal interviews, several faculty members who had served on the now inactive Campus Beautification Committee as well as others who had served on the Long Range Traffic and Parking Planning Committee mentioned their participation in the compilation of a set of formalized recommendations for campus parking construction standards. Professor George Baumiller, an active member of both committees in past years, supplied a copy of a related memo from his personal papers. This memo is reproduced as Figure 1. Current Architectural Services personnel and the current Vice-President of Business and Finance were unaware of the memo.

Although the city enforces its codes by issuing or withholding building and occupancy permits and by on site inspections, the University does not currently enforce any landscape or parking lot design code. Reporting unsafe conditions in OSU parking lots observed by Campus Police and cadet trainees while patrolling lots for vehicle parking infractions occurs at times and are reported by them to Grounds and Labor. Grounds and Labor Department does not conduct inspections of conditions in parking lots, even after storms. Storm-damaged trees are sometimes reported to Grounds and Labor by Security Officers and to some degree by the lot users (Burnett, 1988).

The Official Parking Improvement Plan

The Long Range Traffic and Parking Planning Committee approved funding in spring, 1988 for twelve improvements to streets and parking lots on the campus (Personal

ARCHITECTURAL SERVICES
FOR OKLAHOMA STATE UNIVERSITY and THE A&M INSTITUTIONS
122 ASPPA Bldg OSU Campus, Stillwater, Okla. 74078 (405)624-7131

TO: Dan Lingelbach, Chairman, Long Range Traffic and Parking Committee

FROM: Bill D. Halley, AIA, Director BDH

DATE: April 24, 1985

SUBJECT: General Parking Guidlines (84/85-NR-18)

As a preliminary attempt to set forth guidelines and information for the future development of parking lots, etc., we offer the following comments we are now using as criteria.

GENERAL PARKING GUIDELINES

Permanent Parking (New Construction)	- Concrete paving with curbs or asphalt paving with curb and gutter. 5' to 7' traffic islands with trees, light poles and storm sewer when possible.
Phased Construction- (As Funds Permit)	Asphalt pavement with asphalt concrete curb sections. 5' to 7' traffic islands with trees, light poles, and storm sewer when possible. Future work would include additional asphalt and concrete curb.
Temporary Parking	- Gravel or asphalt pavement with asphalt or concrete curb sections.
Landscape Work	- Generally designed and completed by Physical Plant Grounds Department as directed by the OSU Consultant Landscape Architect.

Note: Parking and related items as they exist today show an evolutionary process of materials, methods and concepts. They reflect the needs and available funds at the time of construction.

BDH:bh

cc: File

Figure 1. Memo of General Parking Guidelines, 1985.

interview, Eaton, summer 1988) (see Appendix B). Landscaping and visual enhancement were not included.

In general, parking lot improvement projects are funded from moneys collected from faculty, staff and students for parking permits. The money is intended for use in maintenance and construction of parking facilities, i.e. the repair of pavement, the painting of stripes, upgrading crushed rock lots to asphalt, improvements to traffic control signs, and the construction of new lots. Recently the construction of much needed sidewalks connecting with some parking lots was included. The fact that Parking Permit Fees had remained the same for the 15 years prior to when they were raised by $10.00 in August of 1988 has been cited by some in the administration as one reason for problems in OSU parking lots.

Examination of Parking Lot Articles in the
Local News Media

A hand search was conducted of all published issues of the campus newspaper, the O'Collegian, from 1986 through 1988. A similar search was conducted of corresponding issues of the local city newspaper, The Stillwater News Press. Only an occasional article regarding parking was found. Two representative articles are reproduced in Appendix C. The general topic of the articles concerned the location, amount and user designation of campus surface parking spaces. No articles were found regarding the visual quality of campus parking lots. The degree to which people insist on seeking convenient parking spaces is revealed in one article that stated that on the average, 55,000 parking citations were issued each year by Campus Police. If the average fine of $15.00 per citation is collected, that represents revenues of $825,000.00 per year.

Findings from On Site Inspections

The Public Campus Vehicular Impression

The public vehicular impression (or street appeal) of the OSU campus is the sum total of the visual phenomena experienced by a person riding in the front seat of a passenger car as it is driven on the streets that ring the campus or cut through it. The vehicular image along University Avenue which forms the southern boundary of the campus is by far the most attractive of the public vehicular impressions of OSU; but, at the same time, it is the one least often experienced by the general public. For the most part, the public vehicular impression of OSU is formed while driving along Hall of Fame Avenue which lies across the northern edge of the campus core. Hall of Fame Avenue is a heavily traveled four lane arterial road with turning lanes at intersections. The recent extension of Hall of Fame Avenue to Perkins Road (Highway 177) created a very heavily traveled bypass. Traffic now flows relatively unimpeded from Highway 51 (Sixth Avenue) on the west side of Stillwater to Highway 177 (Perkins Road) on the east side (see Appendix D). The public vehicular impression of OSU along Hall of Fame is one giving a back door or service-type image of the campus. It is not a welcoming, front door, or first class type of impression. The fact that the football stadium, field house and baseball stadium also lie along Hall of Fame means that it is a major image generating element for the large public crowds attending collegiate and prepschool athletic events on a year round basis.

The unsightly public image along the north side of the campus is the result of several factors, but the major element affecting public impression of the campus is the condition of the parking lots on both sides of Hall of Fame Avenue where it intersects Monroe and Hester Streets. Conditions at the Hall of Fame and Monroe Street intersection, a major campus entry point on the north side of OSU are seen in Figure 2. Figure 3, located immediately below it for contrast, shows how the campus entry of another state university has used arborvitae hedges and street trees to soften the effect of a parking lot in a similar

Figure 2. Looking South Toward Intersection of Monroe Street and Hall of Fame Avenue.

Figure 3. Intersection of Lindsay and Parrington in Norman, OK.

location. Figure 4 shows the streetscape at the intersection of Hall of Fame Avenue and Hester Streets on the north side of OSU looking southward toward the campus and across parking lot 10 B east of Cordell Hall. Figure 5 located directly below it for comparison shows the same intersection but with the view looking toward the large commuter lot north of the football stadium. It illustrates how the trees in lot 9 soften the appearance of the lot.

For the purposes of this thesis, the study of the public vehicular campus image was emphasized more than the internal campus image generated in areas where access to the general public is restricted. However, parking areas between residence halls and the classroom buildings on the western edge of the campus core, such as lot 43 and 57 (shown in Figure 7) have the same problems as those in the more public areas such as lot 6 on the south side of the football stadium (see Figure 6).

Most of the 122 campus parking lots lie alongside or have entrances from one or more of these three main roads. An attempt was made to examine each of the 122 officially designated parking lots on the campus by means of an on site inspection. Most of the lots were visited at least once; some were visited several times during a period of 14 months . Some information about every campus lot was entered in the data base, but some lots were studied in greater depth than others as the scope of the investigation was narrowed. Photographs representative of campus wide conditions as well as photographs of conditions in three target lots are included in this thesis. Individuals interested in examining the complete data base or the remaining six photo albums are invited to contact the evaluator through the OSU Department of Horticulture and Landscape Architecture.

A variety of construction types was found in campus parking lots. Some lots were paved with concrete or asphalt and had concrete curbs and gutters. Others included interior medians containing mature trees, adequate lighting, underground electrical service, perimeter screening, and properly channeled stormwater management. This type of construction typified the highest standard of parking lot construction existing at OSU and is typified by lot 34 south of Physical Sciences and shown in Figure 8. Other lots

Figure 4. Looking South Toward Campus at Intersection of Hester Street and Hall of Fame Avenue.

Figure 5. Looking North Toward Intersection of Monroe and Hall of Fame Avenue.

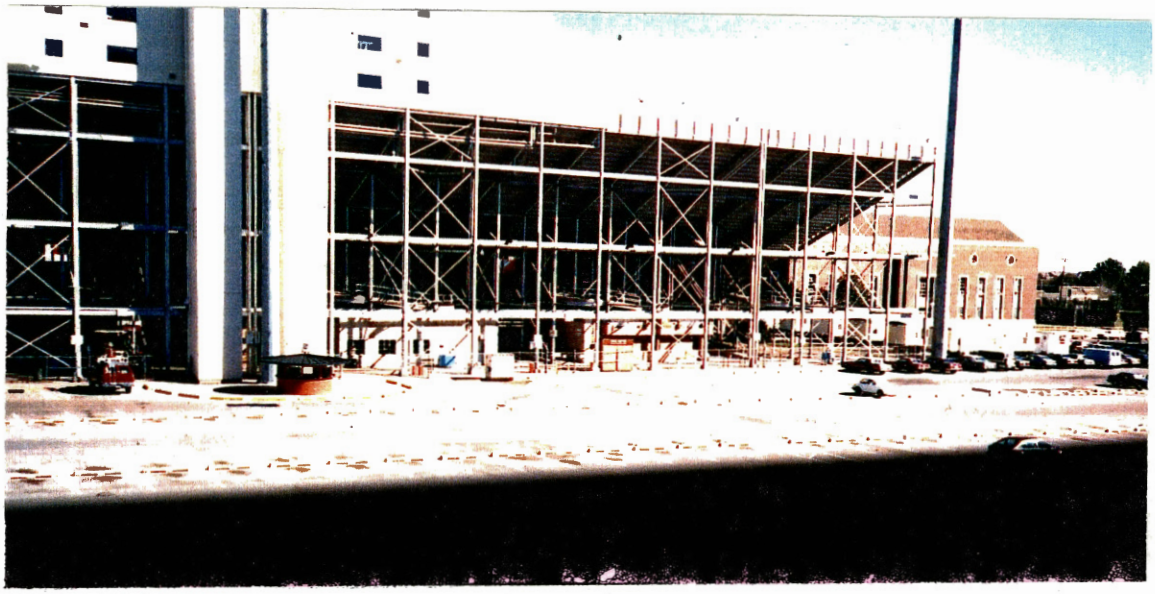

Figure 6. Lot 6 South of Football Stadium.

Figure 7. Lots 43 and 57.

Figure 8. Old Style Parking Lot Median with Shumard Oaks, Lot 34.

Figure 9. New Style Parking Lot Median Without Trees.

consisted of little more than a level surface of dusty crushed stone with concrete tire stops instead of curbs and guttering, no trees in interior medians, telephone pole type lighting fixtures, and unsightly overhead wires. Such a lot is lot 94 located at the corner of Knoblock and Scott and shown in Figure 10. This type of construction typifies the lowest standard of construction observed. Another construction practice observed on campus is the replacement of plant materials in existing medians with gravel. In a few newer lots such as the recently refurbished lot north of Gallagher-Iba Hall (shown in Figure 9) the existing large shade trees in the medians were eliminated and replaced by concrete surfaces in the medians. Most campus parking lots were found to exhibit construction standards somewhere between these extremes with a majority closer to the lower level of construction than to the higher.

In addition to providing space for parking cars, OSU parking lots support a variety of other functions. One or more dumpsters are usually found in most parking lots. Lots adjacent to a building also accommodate loading docks, loading zones, and service areas for equipment such as electrical transformers. Dumpster location is frequently at the end of a sidewalk sightline where it connects to a parking lot or in a parking space highly visible from the adjoining street. Figure 11 shows the dumpster in lot 19 south of the Seretean Center. The dumpster has been placed in an unscreened parking space at the side of the lot closest to Knoblock street. The lot at the corner of Hall of Fame Avenue and Monroe Street has been designated for overnight storage of OSU vans and buses in order to keep more of the interior or nonpublic lots available for staff working from 8 am to 5 pm (see Figure 2). This practice also detracts from the public vehicular image of the campus.

On site inspections revealed a campus wide lack of maintenance in parking lots. One or more broken or disintegrating concrete tire stops were present in almost every lot. Concrete tire stops are used as a substitute for a permanent concrete barrier curb. They are constructed of concrete reinforced with iron bars and are fastened to the ground surface by iron pins. When they are damaged or torn from their positions the iron pins and

Figure 10. Lot 94 – Temporary Construction Quality Coupled with Lack of Screening.

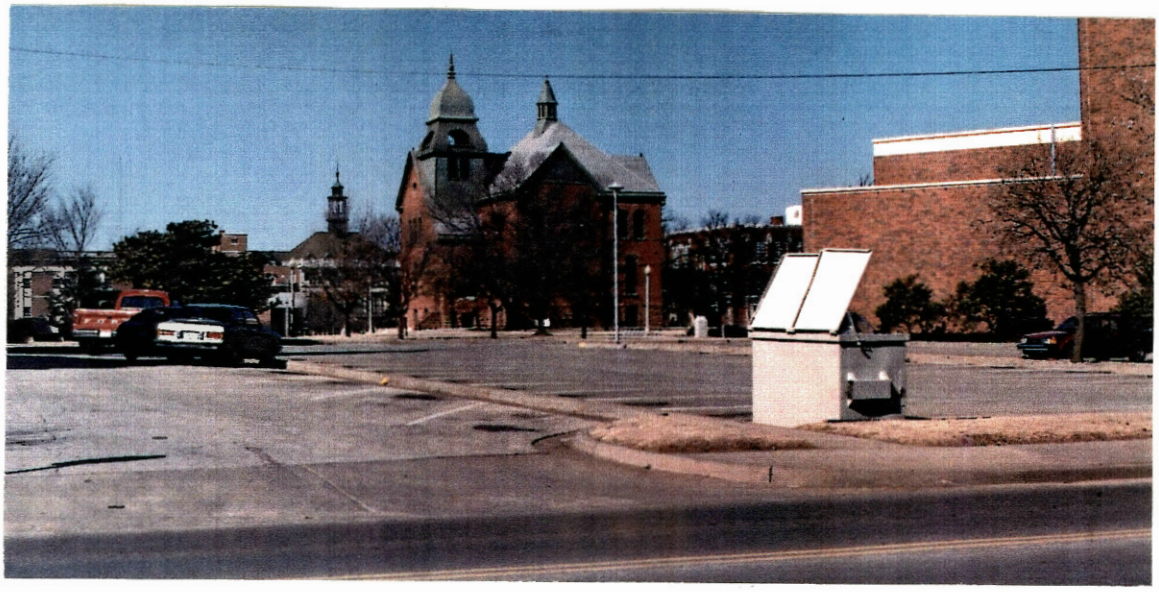

Figure 11. Unscreened Dumpster Placed at Knoblock Street Edge.

Figure 12. Juniper Hedge Screen, Sidewalk, and Trees in Lot 16.

reinforcing bars are exposed. One typical broken tire stop is shown in Figure 13. It is obvious in the picture that the exposed iron bars and pins are hazardous to both people and tires.

An inspection of the Student Union Parking Garage, which is also a designated visitor parking lot, showed that there existed a generally low level of lighting which made it appear uninviting as shown in Figure 15. Pieces of newspaper glued to the windows of the pay booth give it the appearance of a vacated store front while the dirty aluminum siding of the booth gives evidence of longstanding neglect (Figure 16). This impression was reinforced by other conditions in the lot such as the sharply upturned corners of a bent metal drain cover (Figure 14) as well as the missing electric junction box cover on a metal light pole (Figure 17) and was further emphasized by the confusing and faded signage near the emergency telephone shown in Figure 18.

Further evidence of gross neglect was evident in the newly refurbished lot 66 at the Veterinary Medicine facility. The median had been planted with four Aristocrat Pears and the perimeter planted with three crabapples surrounded by brick on sand paving. Figure 19 shows the conditions in that lot later that summer. The three crabapples are dead as shown in Figure 20. The brick on sand paving near the crabapples was cursed with an unknown gray substance shown in Figure 21. Figure 22 shows that, of the four Aristocrat Pears originally planted in the median, one was missing entirely with only a shallow depression remaining and one had been broken off about twelve inches above the ground. The broken tree will never recover the desirable form of strong central leader and desirable clear trunk span of the remaining two. Figure 23 shows the remaining two trees have no protective staking. Because the hazards to trees in parking lots are even greater than in lawns, all newly planted parking lot trees should be protected with at least two stakes. Figure 24 shows an example of proper protective staking for Chinese Pistache trees that were planted at the same time in front of the parking lot at the USDA-ARS on Western Road.

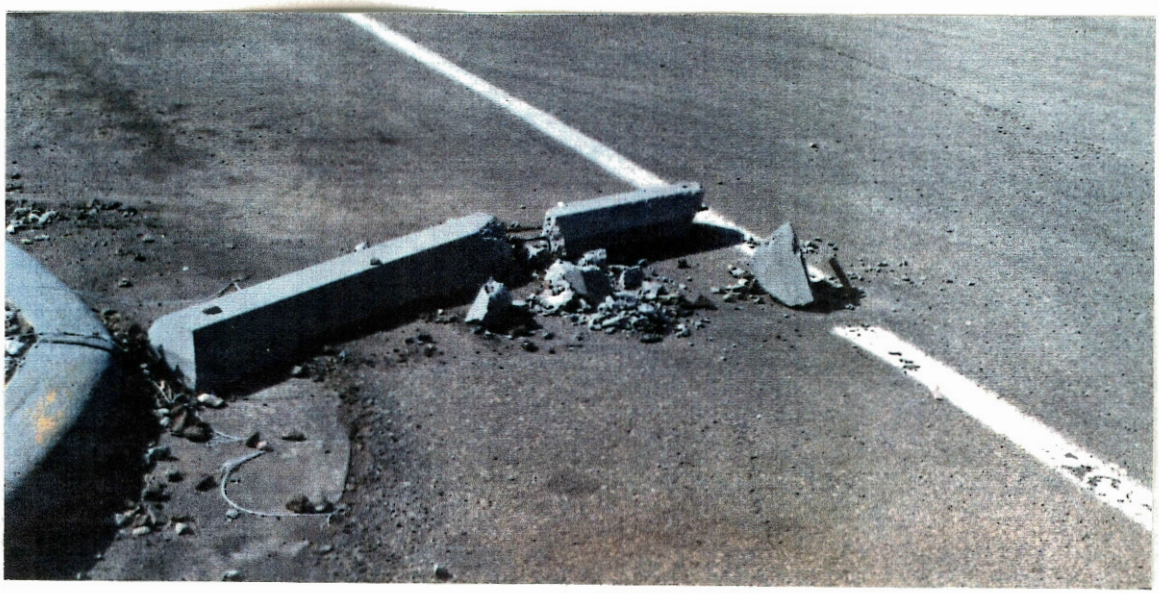

Figure 13. Example of Damaged Concrete Tire Stop.

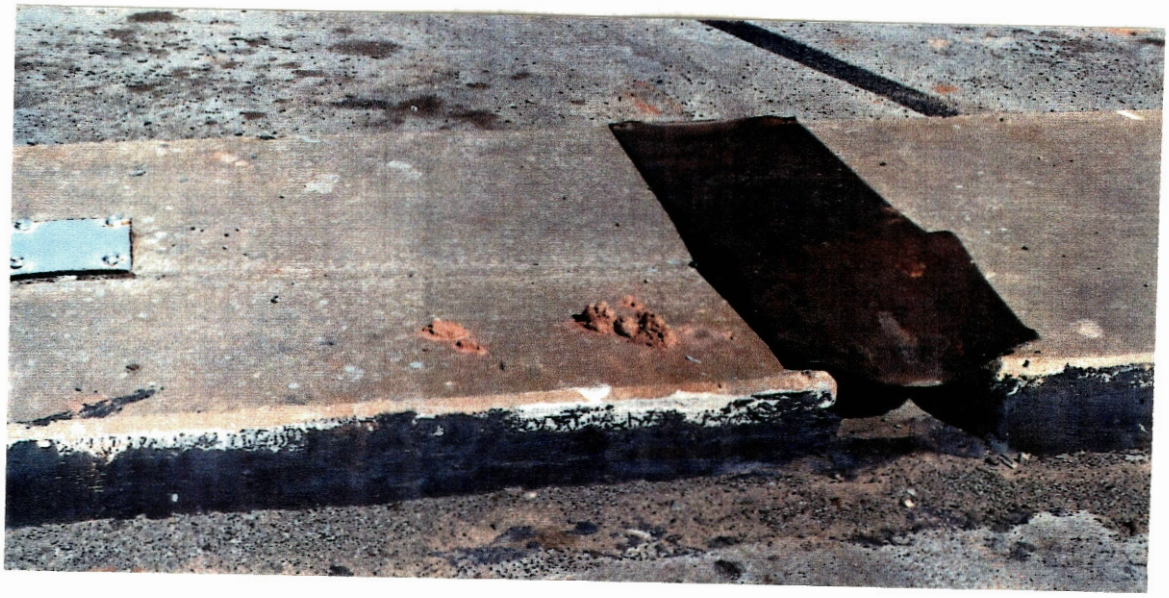

Figure 14. Metal Hazard in Student Union Parking Garage, Fall 1987.

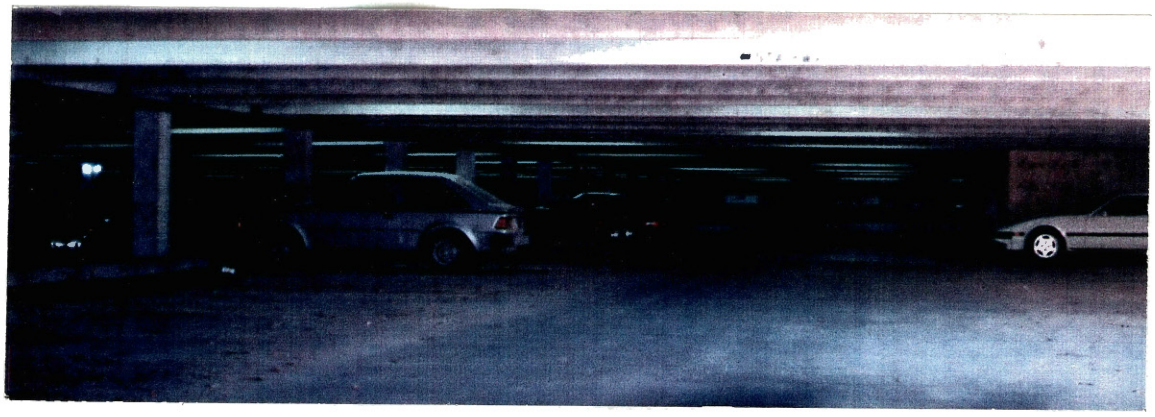

Figure 15. Student Union Parking Garage Lower Level, Summer 1987.

Figure 16. Student Union Parking Garage Pay Booth, Summer 1987.

Figure 17. Cover Missing From Electrical Wire Junction Box.

Figure 18. Confusing and Faded Sinage by Emergency Phone.

Figure 19. Vet. Med. Lot 66 Median Condition, Spring 1988.

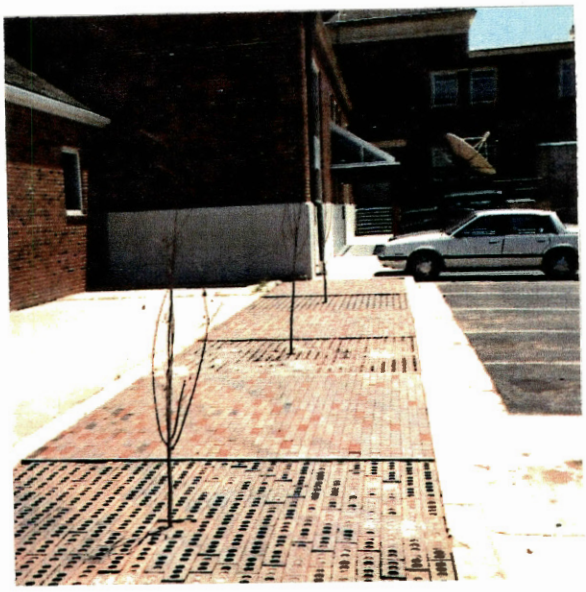

Figure 20. Vet. Med. Lot 66 Perimeter Condition, Spring 1988.

Figure 21. Vet. Med. Lot 66 Close Up of Gray Substance on Brick.

Figure 23. Vet. Med. Lot 66 Unprotected Tree.

Figure 24. Example of Recommended Protective Tree Staking.

Figure 22. Vet. Med. Lot 66 Broken-off Tree, Spring 1988.

In addition to obvious neglect to maintenance, the majority of the lots had no visual or climatic enhancements such as interior trees or other vegetation to soften the visual effect and to ameliorate the heat and glare of the summer sun. Perimeter screening such as the arborvitae hedge shown in Figure 25 was observed at several older lots. The hedge is growing along the east side of lot 6 along Knoblock Street. Arborvitae thrives in the tight clay soil and minimal moisture at OSU. Junipers also thrive in the tight clay and low moisture conditions on campus. A juniper hedge screens lot 22 south of the entrance to Paul Miller Journalism building as shown in Figure 26. However, no effort was made to screen the companion lot on the north side of the same entrance. In Figure 12, a Juniper planting defines a circulation path, visually breaking up the vast expanse of parked cars and screens pedestrians from moving cars in the adjacent driving lane. That example is found in lot 16 north of Morrill Hall. Such an application could be used to screen the Seretean dumpster pictured in Figure 11 on the same page.

Two other instances of screening were observed. On the north side of the power plant along Hall of Fame Avenue, a wooden privacy fence screens an unsightly view of a parking and loading area of the power plant. An American Arborvitae hedge was used in the same way to shield the loading docks on the south side of the Ag Engineering Building and parking lot 52 south of it.

Although screening parking lots from adjoining residential property is required of others by code in the City of Stillwater, OSU does not follow that practice. Figure 27 shows lot 94 which was constructed in 1987 without screening between the lot and the adjoining residences. Figure 28 shows lot 100 under construction across Hall of Fame Avenue north of the football stadium. Lot 100 joins two residences on the northeast corner. An examination of the plan prepared for this lot by Architectural Services shows no provision for vegetation of any kind. Sidewalks have been suggested as an after thought (Figure 29).

Figure 25. Aborvitae Hedge Screen for East Side of Lot 6.

Figure 26. Juniper Screening of Lot 22.

Figure 27. Lot 94, No Screening from Adjoining Residential Use.

Figure 28. Lot 100 Under Construction, Spring 1989.

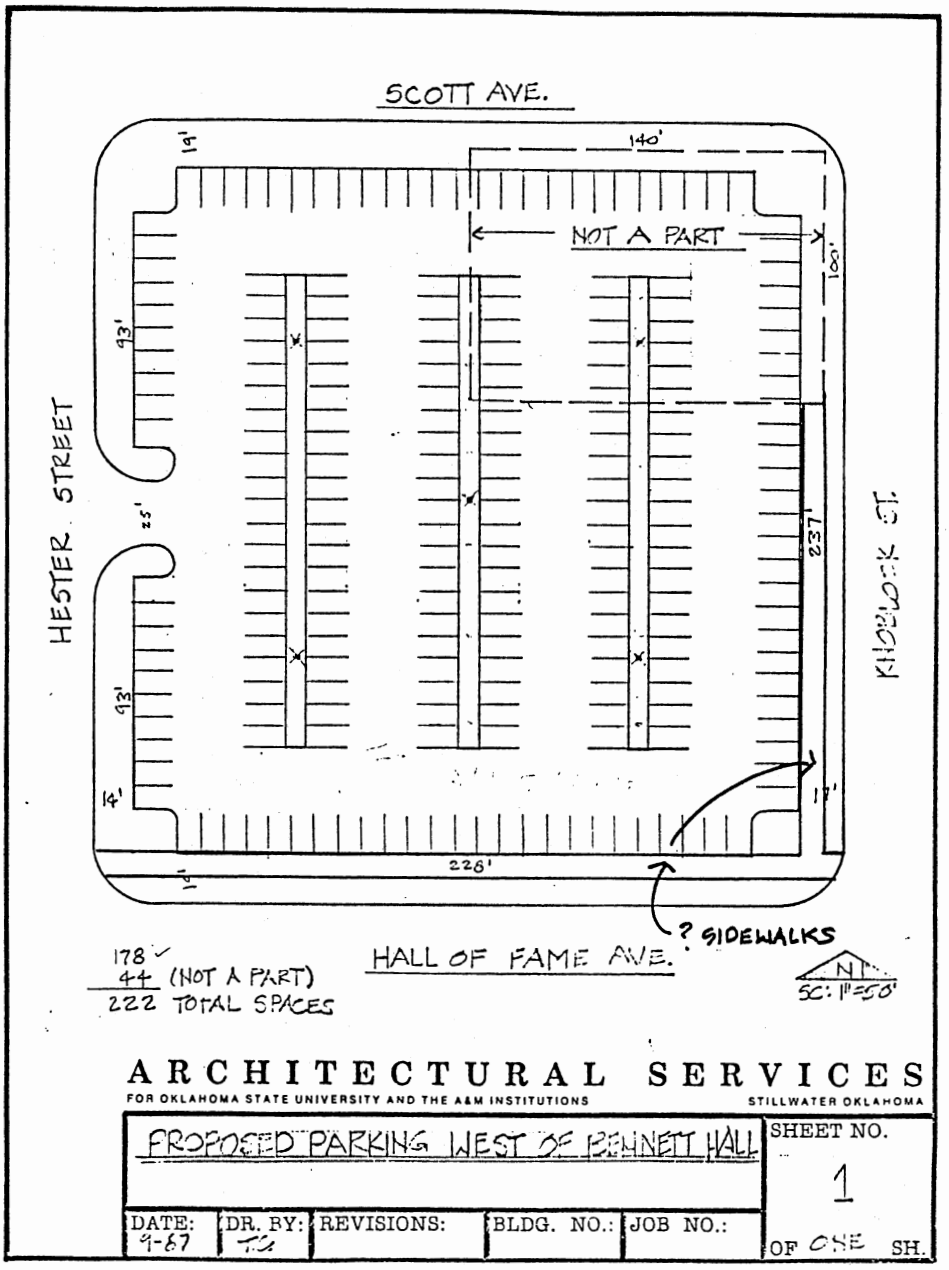

Figure 29. Architectural Services Design for Lot 100.

Although most parking lots had some setback from the adjoining street, it was observed along the east side of Hester Street near the stadium that lot 8 had only concrete tire stops separating parked cars from street traffic (Figure 4). Along the west side of Hester street there is no buffer between lot 10 and the adjacent sidewalk. Barriers to pedestrians walking along the sidewalk are created by the front ends of the diagonally parked cars projecting over the already too narrow sidewalk (Figure 5). In a non-university area of the city, this would be a violation of the Stillwater City Code requiring that parking lots be placed no closer than five feet from the property line along a street front or a side yard.

Various kinds of trees were observed in medians of some lots, but the most prevalent tree was the Bradford pear. The most characteristic feature of the Bradford pears found in OSU parking medians was the very small span of clear trunk between ground level and the first branch. The average distance was estimated to be three feet as shown in the typical example in Figure 30. This distance is well below the minimum clear trunk height of 6 to 8 feet usually required by most city ordinances for street trees. The low branching was frequently observed to occur in conjunction with multiple branches originating from a central point. That is a very weak branching condition that allows the trees to be split apart by storm winds. It is not a characteristic recommended for street trees. Figure 31 shows the resulting wind damage to Bradford Pears in lot 9. Street tree ordinances usually specify that street trees exhibit one strong central leader such as shown by the Sycamore in Figure 32 growing in a parking lot median at another state university. Despite the undesirable form of most OSU Bradford pears, this tree has proved to be well adapted to tight clay soils; and those Bradford pears that have escaped wind damage have thrived in OSU parking lots despite the lack of maintenance or irrigation. Horticulturalists now recommend that Aristocrat Pears with a strong central leader be planted as replacements for Bradfords in parking lots (personal interview, Whitcomb, 1987).

Figure 30. Typical Form of Bradford Pears Used on OSU Campus.

Figure 31. Typical Wind Damage to Bradford Pears in Lot 9.

Figure 32. Example of Desirable Street Tree Form.

Other tree species encountered in OSU parking lots in lesser numbers included Marshall Seedless Ash, a specie adapted to alkaline soils but prone to lilac borers in tight clay soils. Another tree found in some lots was the Chinese Pistache, a tree well adapted to the tight clay soils and sparse rainfall at OSU and also relatively disease and insect resistant. Figure 34 shows the scarlet fall foliage of a Chinese Pistache in lot 16 north of Morrill Hall.

Several other species of trees were observed in medians of different parking lots. Coniferous species were represented by Austrian, Scotch, and Japanese Black Pines in medians of some of the older lots. The use of these trees in parking lot medians is not recommended because of resin dripping on cars from the trees. Figure 33 shows some pines in the medians in eastern half of lot 9. However, also shown in the same figure is a young Lacebark Elm. The Lacebark Elm is a true Chinese elm. It is fast growing and is resistant to Dutch Elm disease. Lacebark Elms grow well in Stillwater's tight clay soils. It is especially suited to use in parking lots and other public places because its small leaves, shed almost overnight in late fall, disintegrate rapidly. It develops a broad shady canopy similar to the American Elm. Because the Lacebark Elm produces its seed in the fall, it does not become a weed tree like the Tree of Heaven or the Siberian Elm (personal interview, Mitchell, 1986).

Other desirable deciduous trees observed in parking lot medians included handsome, mature Shumard Oaks in one of the oldest lots, lot 34 south of Physical Sciences and shown in Figure 8. Young Soapberry trees were observed in pay lot 80 south of the Colvin Center. This species, native to the area, was placed there as an experiment and seem to be thriving (Burnett, 1988).

A few species not recommended for growing in tight clay soil or low moisture conditions were nevertheless found struggling in some OSU lots. These were Gingko Trees and Caddo Sugar Maples (Figure 35 & Figure 36). These species require loam soils and considerable moisture to develop their full potential. When such species are planted in

Figure 33. Pines in Lot 9 Medians. Young Lacebark Elm in Lawn.

Figure 34. Chinese Pistache Grows in Tight Clay Soils.

Figure 35. Gingko Trees at West Side of Lot 6 Along Hester Street.

Figure 36. Caddo Sugar Maple in Lot 7.

Figure 37. Empty Tree Planter in Lot 10B.

Stillwater, they should be planted in turf areas that receive supplemental irrigation during the long, hot, dry summers typical at OSU. When planted in a parking lot or along a street in Stillwater, they suffer not only from inadequate moisture but are very much stressed by the reflected heat from the paving surface. A number of Caddo Maples were planted at some unknown time in the past in railroad tie planters in parking lot 10 B, east of Cordell Hall at the corner of Hall of Fame Avenue and Hester Street. Through the years, as they died out they were not replaced with a more desirable species. The highly visible lot has only three trees left. The empty railroad tie planters were periodically removed from the parking lot but, as shown in Figure 37, were not paved over. When it does rain, the bare spots become mud hazards.

The presence of medium to large trees in parking lots 51, 52, 91, 34, 9, and 74 indicated that, at some time in the past, tree planting in parking lot medians was a well developed practice at OSU. However, personal observations of plant material in parking lots 6, 9, and 10 from 1984 to 1989 showed an overall decline in the number of surviving trees. Examination of four of the most recently constructed lots at OSU, 66, 94, 11, and the newly combined lots 3 and 4 on the north side of Gallagher-Iba Hall shows that tree planting in parking lot medians and the replacement of damaged trees is no longer considered to be a part of the program. This finding is consistent with the current Grounds and Labor Department policy of not maintaining trees in parking lot medians or replacing damaged or dead trees in parking lots. Grounds and Labor is advocating the construction of medians covered with river gravel or concrete rather than planted with trees (Burnett, 1988; Newton, 1988) (see Figure 9).

No campus wide street tree plantings exist to visually knit the campus streetscape together. When trees were observed to be planted along the perimeter of some lots they were generally of the smaller ornamental species such as Red Bud, Golden Raintree, and Russian Olive, and the plantings were generally sparse. There is nothing wrong with those trees when used for ornamental purposes and for accent planting, but they should not bear

the burden of being the main street tree species when other more suitable canopy type shade trees species will grow in the area. Some street tree plantings in the past have utilized pines but that practice is contrary to the purpose of street tree use in a hot arid climate where a broad spreading shade-giving canopy tree is a better choice.

Summary of On Site Investigations

Although examples were found of screening and of internal street trees, the vast majority of OSU parking lots had neither. On the whole, the use of street tree plantings along the heavily traveled campus streets and the perimeters of campus parking lots was found to be very sparse. The visual screening of parking lots occurred only in isolated instances on some of the older campus lots and not at all in newer ones located in residential areas. Trees were being systematically eliminated from interior parking lot medians in older lots and are not being planted in new lots.

Maintenance of paving, repairs to damaged concrete tire stops, filling in pot holes in crushed rock lots and repainting of worn stall stripes was found to be lacking in almost all campus lots, and unsafe conditions were apparent in some. The overall observation of campus parking lots showed that little or no maintenance was being provided.

The Relationship Among the CDC, the Temporary Lot Phenomenon, and the Present Condition

Emphasis on Parking Garage Construction Proposed in the Campus Development Concepts

The success of the conceptual design for Campus Development Concepts, the University's most recent Master Plan, depended to a large degree on the construction of parking structures to replace surface parking spaces recommended for removal from the campus in order to provide green space or future building sites. That aspect of the master

plan was wholeheartedly embraced for a few years; meanwhile, the condition of the surface lots deteriorated. No one seemed to be concerned because the surface lots had come to be regarded as only temporary and were expected to be replaced soon by something better when the parking garages were built.

However, conditions changed. Enrollment at the university and the number of parking permits issued have both decreased, and the economic condition of the whole state of Oklahoma declined as well. As result of these changes, parking garages are no longer considered a near reality. Given the current conditions, it has been estimated that it would require more than twenty years to accumulate enough money from parking permit fees to build one parking garage, let alone the five mandated by the plan. At the same time the poor state of the economy has precluded floating a bond issue. The university administration has decided that construction of parking structures is not a realistic solution to the parking problem in the short term and is redirecting its approach to parking, shifting from emphasizing the most spaces for the least cost toward some consideration for the enhancement of surface lots.

The Temporary Lot Phenomenon

The problem of surface parking lot appearance goes deeper than just a lack of making repairs to lots. The over all aesthetic appearance of the campus parking lots is very low. Although standards describing the desired median width and mandating the planting of trees in the medians were proposed several years ago, those guidelines were not been followed and became lost from official policy. Also, those standards were considered binding only for permanent lots and not temporary lots (Personal interview Cobb, 1987). There was no obligation on the part of many people to follow those standards because they considered all parking lots to be temporary; parking garages or other buildings were destined to be built on their sites. In recent years OSU has experienced a proliferation of those unsightly temporary lots. Many of them are located in areas of high visual impact,

and they detract from the campus image or street appeal. Because the economic future is so uncertain, it is likely that many of them will persist for a number of years. For these reasons OSU should require that all new parking lots be constructed according to a higher standard of visual quality and older lots upgraded or aesthetically enhanced as much as possible.

Examples of Visual and Climatic Enhancement
for Three Representative Campus Lots

To demonstrate that improvement of the visual character of current surface lots is possible, design enhancements have been developed for three typical lots in high visibility locations on campus. The target lots are lot 11, located east of the Noble Center, lot 10B east of Cordell Hall on the southwest corner of Hester Street and Hall of Fame Avenue, and lot 100, across Hall of Fame north of the Football stadium (Plates 3 & 4).

On the OSU campus the climate is uncomfortably hot in summer. For this reason large canopy shade trees have been chosen as the predominate design element for the parking lots and streets. The desire to mitigate the heat buildup in parking lots is a primary concern, and the amelioration of harsh climatic effects should not be denied to users of parking lots. It also fulfills a debt to society as a whole to help reduce any contribution to the increasing heat cone over urban areas.

The site for lot 11 was formerly occupied by quonset huts which were constructed in the early 1950's and housed the diesel and radiation labs. Figure 38 shows the predemolition condition of the site. Figure 39 shows the newly constructed lot 11. It has been designated a temporary lot because a new engineering building will some day be built on this same site. Although in an area of high visibility, it is of minimum construction with scanty lighting, single concrete tire stops instead of medians with permanent curbs, no vegetation or other visual or climatic enhancement. Figure 40 shows a proposed visual and enhancement design for lot 11. Because of the temporary nature of the lot, fast growing

Figure 38. Predemolition Conditions in Lot 11, East of Noble Center.

Figure 39. Newly Refurbished Temporary Lot 11.

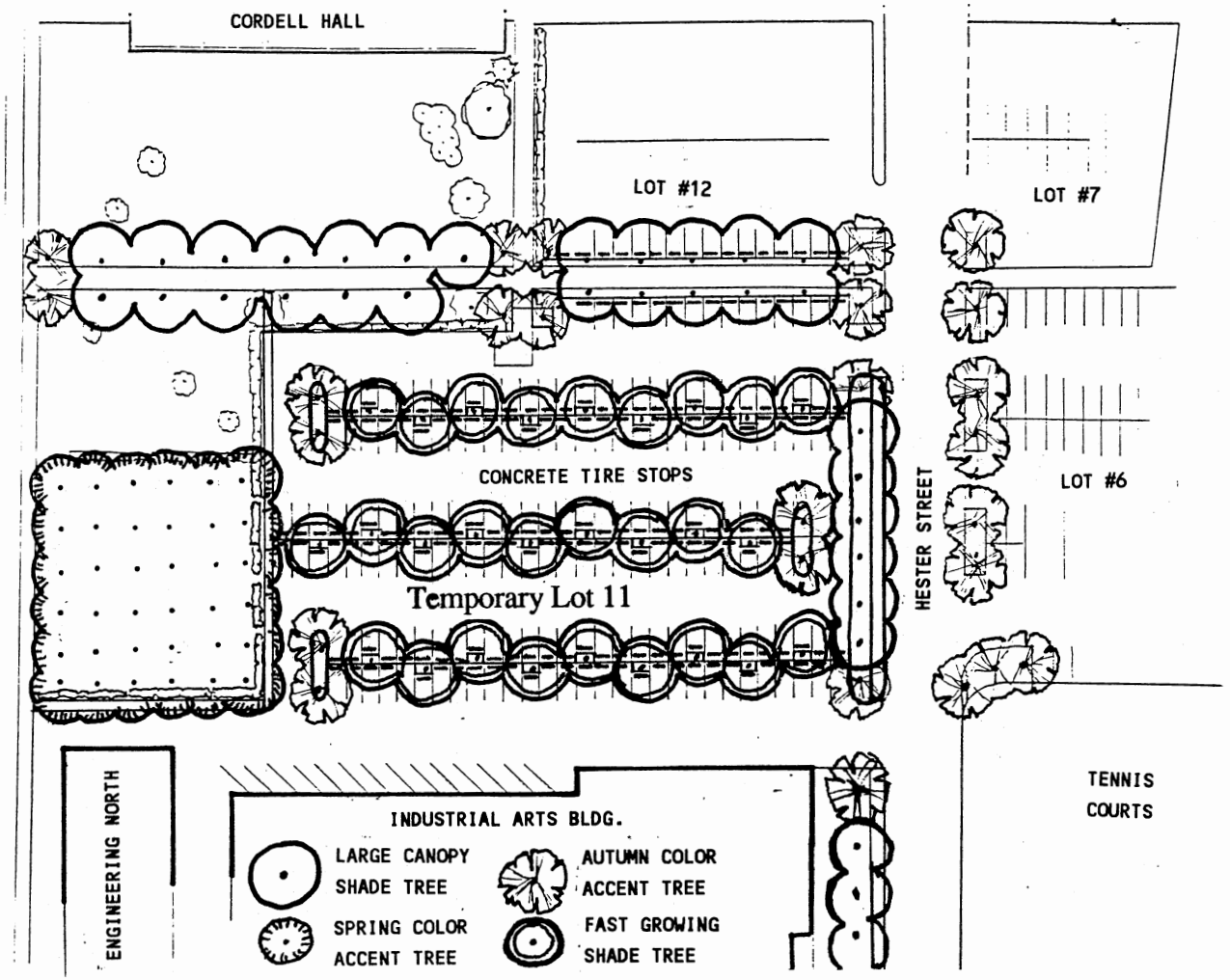

Figure 40. Proposed Visual and Climatic Enhancement for Lot 11.

trees were selected for planting in the lot interior. Large canopy shade trees were planted along Hester street to continue the street tree theme begun farther south on Hester and the south side of the tennis courts in the same area. Autumn color trees are used for accents at the two entrances and the ends of the aisles. The existing evergreen hedge is extended further south across the west end of the lot and then westward toward the Noble Center to visually screen the lot from the central campus mall north of the library. A sidewalk is placed between the hedge and the parking lot interior to channel pedestrian traffic out of the way of the automobiles searching for parking spaces. Nestled in the L-shape of the hedge is a shady grove of 36 spring flowering trees with lower branches removed to provide a clear trunk span of 6' to 8 '. The grove provides a buffer between the lot and the Noble Center and a sheltered cool place for students to gather. Because the lot is used by the athletic department for Posse Club parking, the maximum number of spaces is important. Each space in this particular lot corresponds to a donation of $500 to $999. In order to introduce trees into this lot with out removing parking spaces, a combination small car and tree planter concept was used (Figure 42). In the space formerly occupied by one regular 20 foot car a tree planter protected from automobiles by concrete tire stops was placed in the space and the remaining 15 feet was used for a small car. These small car spaces coupled with trees were placed every four spaces (Figure 40).

Lot 100 (Figure 29) was originally designed to occupy the entire block bound by Hester on the west, Scott Avenue on the north, Knoblock on the east, and Hall of Fame on the south. It lies across the street from the football stadium, across the street west of Bennett Residence Hall and diagonally across the street from the baseball stadium. It will be directly visible from 4 streets. It has been designated a permanent lot and will undoubtedly receive heavy year round use by commuters and persons attending athletic events at Gallagher-Iba Hall, the football stadium, and the baseball stadium. Although the original plan was to use all the block for a parking lot, the northeast corner of the block still is occupied by a residence. In view of the high degree of visibility of this site, a maximum

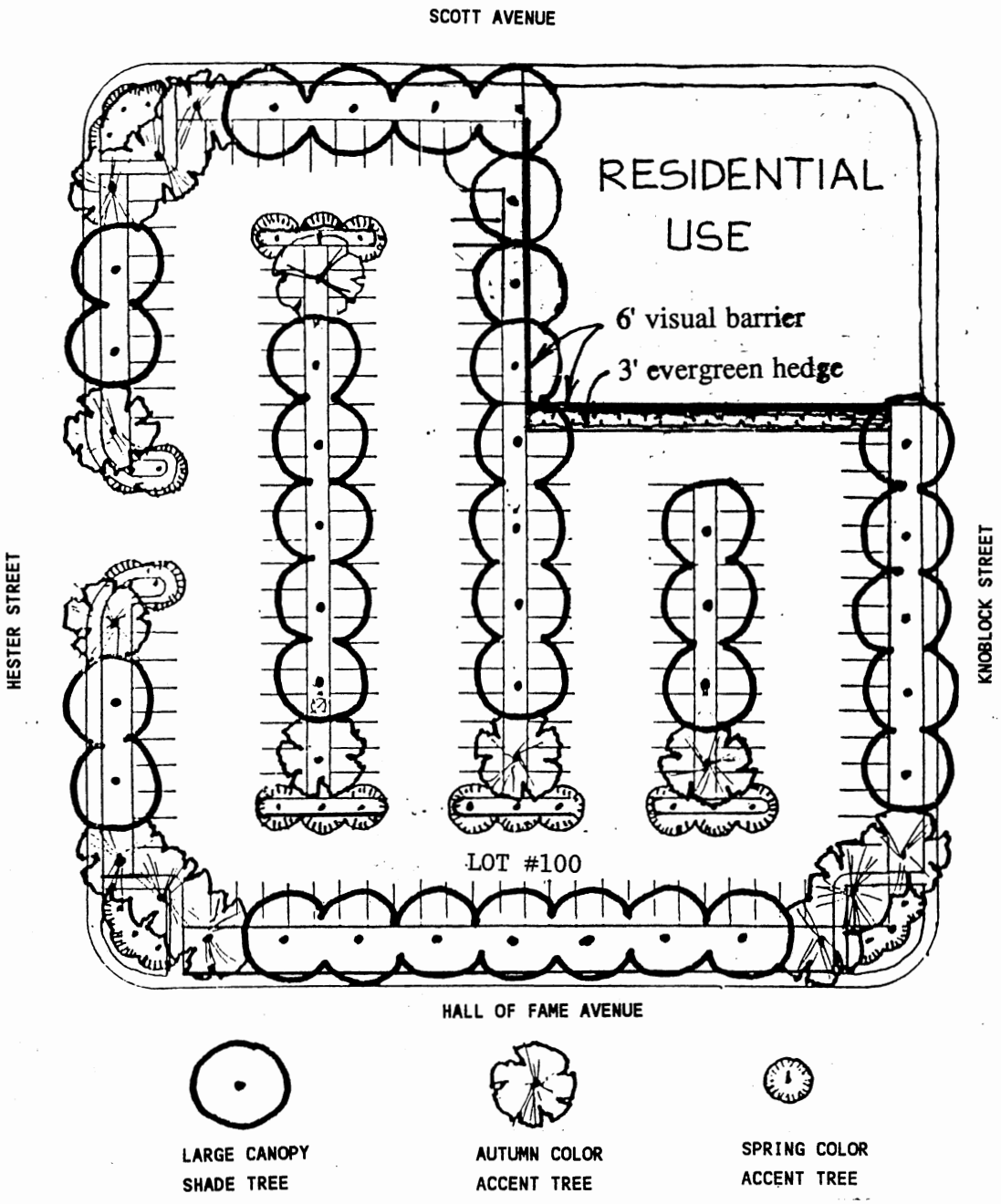

Figure 41. Proposed Visual and Climatic Enhancement to Lot 100.

Figure 42. Combination of Shade Tree Planter and Small Car.

Figure 43. Effective Use of Sycamores in a Narrow Planting Median.

enhancement approach has been taken. Figure 41 shows the proposed enhancement design which consists of a formal planting of large canopy shade trees in the medians and around the four sides. Autumn color accent trees and small spring color accent trees are planted at the ends of the three aisles, the four corners of the lot, and are also used at both sides of the entrance to the lot. The aisles have been oriented in a north-south direction to facilitate pedestrian flow toward campus. A sidewalk with internal corner extensions has been provided around the perimeter of block for pedestrian safety. Although ideally it would be nice to have a buffer strip of grass between the street and the sidewalk to provide for greater pedestrian safety and protection from splashing water, because the connecting sidewalks are at the edges of the street, to remain in context, the same type of sidewalk has been provided. Furthermore, since pedestrian traffic in this area tends to move en mass toward the stadium, grass would soon be trampled out by pedestrian foot traffic and would soon have to be replaced with either more concrete sidewalk or brick on sand. A 6' privacy wood fence has been erected around the corner residence to shield it from the parking lot in accordance with city zoning codes.

A somewhat different approach has been taken for lot 10 B. The current layout of lot 10 B with one way traffic, diagonal stalls and no amenities is shown in Figure 44. The aisle arrangement shown caused the flow from pedestrians and automobiles to conflict. Existing longstanding use of this lot for athletic department parking because of its close proximity to the football stadium suggests that any design which would reduce the number of parking spaces would meet with great resistance. However, the lot is highly visible from Hall of Fame Avenue and from Hester Street and is on one of the entry ways to the campus. Therefore, it should be enhanced with the appropriate street tree plantings as well as with internal trees. A design concept was desired which would incorporated shade trees without diminishing parking space.

The proposed enhancement design for lto 10 B utilizes a shared shade tree planter and small car space to maximize lot capacity. A private parking lot near the campus on the

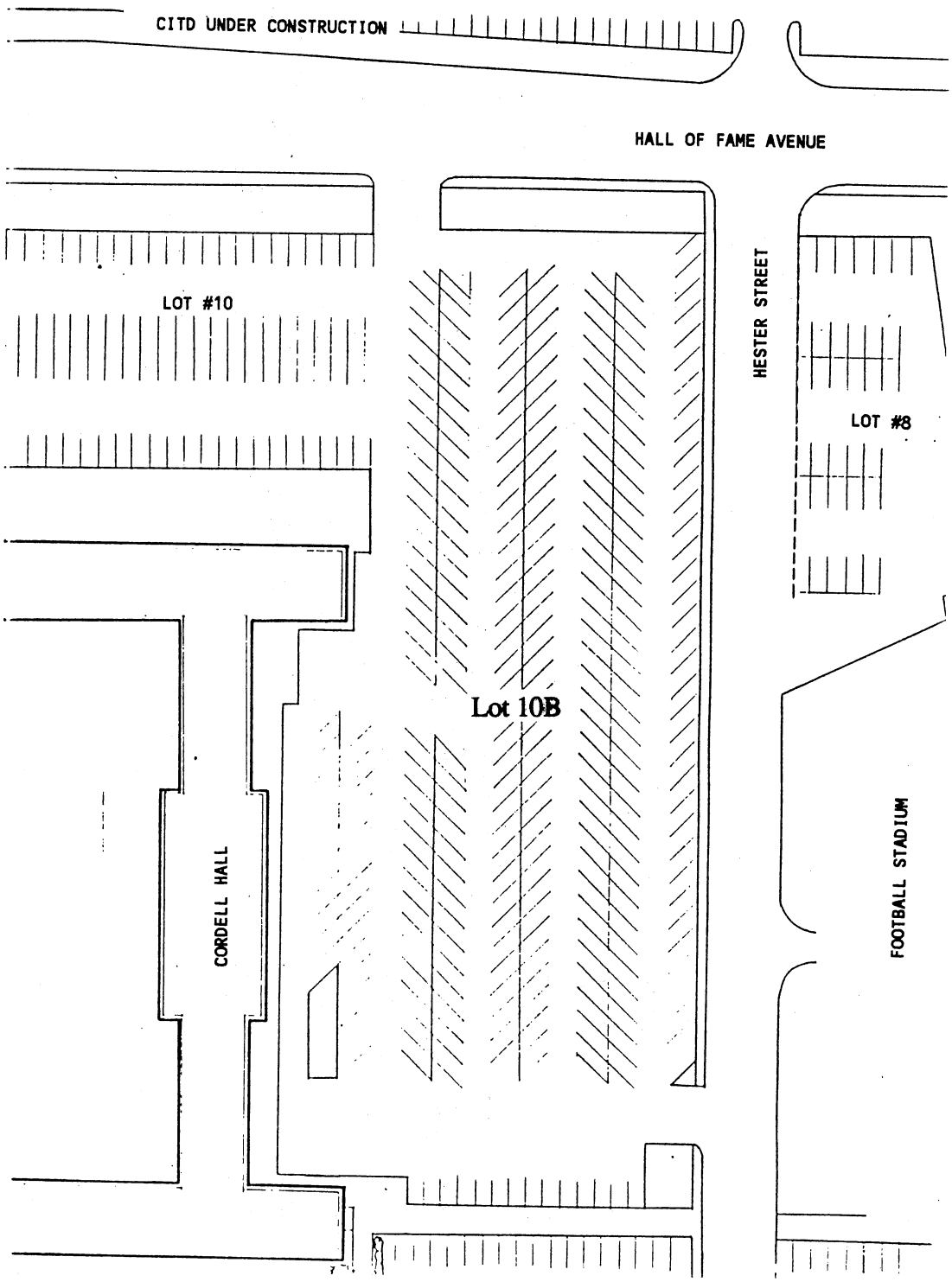

Figure 44. Basemap for Lot 10B.

southwest corner of the intersection of Miller Avenue and Duck Street provides an example of a current use of this combination and is depicted in Figure 42. This shows a shade tree and a small car parking space occupying the same area as a standard parking space. In the proposed enhancement design (Figure 45) the planter-small car combination was repeated every fourth parking space on the perimeter along Hester Street with the same combination used internally in every fourth space within the lot. In order to channel pedestrians toward the sidewalks on the east and west sides, the aisles have been rearranged in an east-west direction. The one way traffic pattern has been changed to two way traffic, and the entrance onto Hall of Fame has been eliminated. Concrete tire stops were used to prevent encroachment of cars on the sidewalk and damage to trees in the planters. Double concrete tire stops were used instead of medians in the interior parking spaces to prevent cars from overhanging into the opposite car stalls. Since this is a permanent lot, large canopy shade trees were planted in the interior planters as well as along the sidewalk by Hester Street. Eight autumn color trees accented the lot entrance while the three existing Caddo Sugar Maples were relocated to the lawn area at the northeast corner of the lot. A double row of large canopy shade trees was planted across the north side of the lot along Hall of Fame Avenue.

The three prototypical visual and climatic enhancement designs in this thesis have been drawn with generic materials such as large canopy street tree, temporary canopy tree, autumn color accent tree, spring color accent tree, 3' evergreen hedge, and 6' visual barrier. The following suggestions for specific plant materials are made based on observations of conditions in Stillwater both on and off the campus, classes attended at OSU, discussions with faculty members and former faculty members, one year of private practice, and personal preference.

The soil in OSU parking lots is compacted alkaline clay and is the primary constraint to selection of plant material. Lacebark Elm, Chinese Pistache, and Aristocrat pear will do well in compacted alkaline clay.

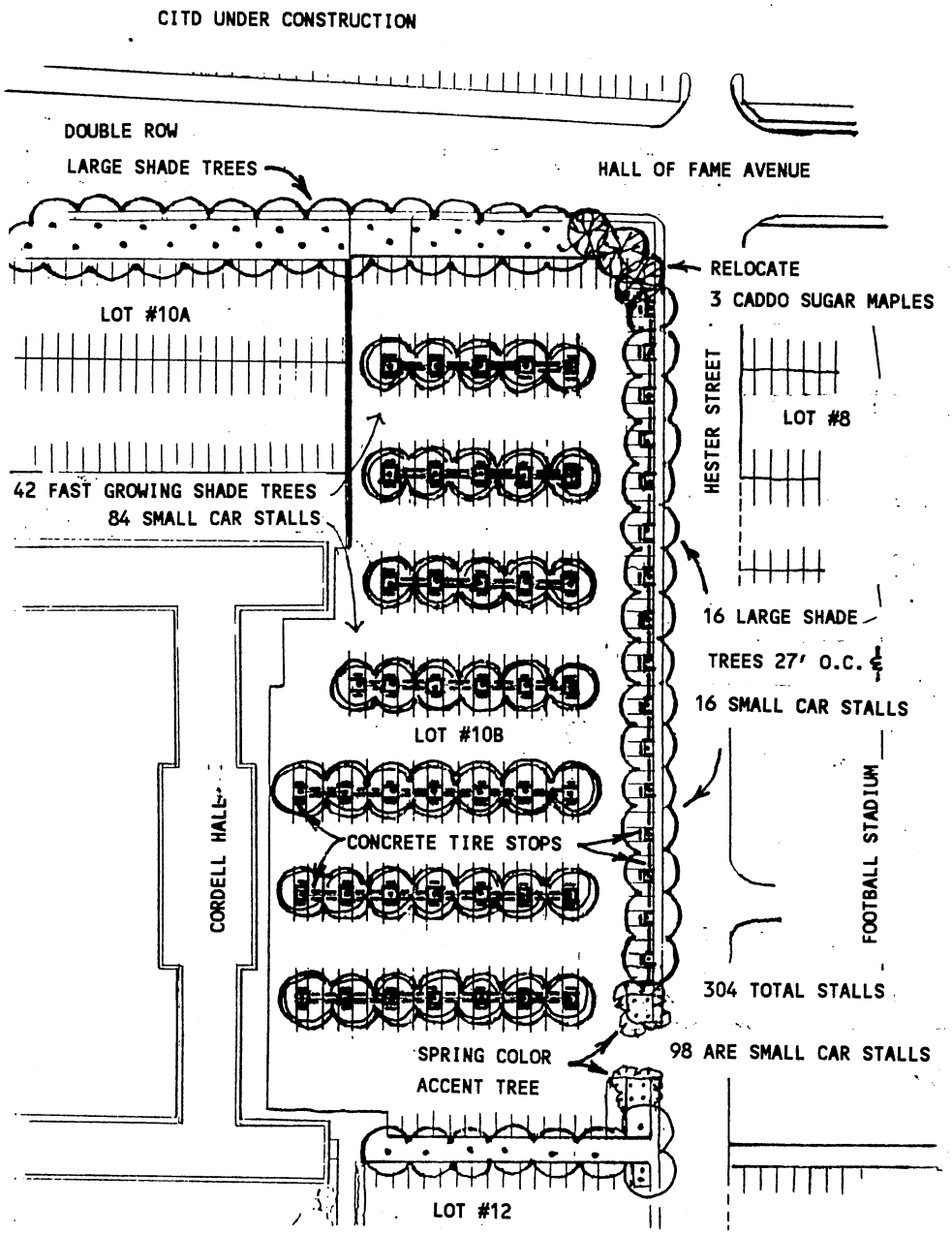

Figure 45. Enhancement Design for Lot 10B.

The Lacebark Elm has been selected as the large canopy street tree. It is resistant to Dutch Elm disease, grows rapidly in compacted clay, has the recommended street tree form of central leader and can be pruned high to provide the desirable clear trunk between ground and the first branch. The leaves are small, shed at the same time, and disintegrate rapidly. The seeds which are produced in the fall do not propagate readily in this climate so the tree does not produce numerous undesirable seedlings in the surrounding area.

Although Shumard Oaks are not generally recommended for alkaline clays, there are a number of large handsome specimens scattered across the campus. It has the desirable form of strong central leader. For that reason Shumard Oak should be considered as a recommended street tree, especially when there is an accompanying expanse of lawn. This tree would be especially effective when used in a double row along the South side of Hall of Fame Avenue. It has reddish orange fall coloring.

Aristocrat pear, a type of Callery pear, is recommended for the small spring color accent tree in parking lots. It is not recommended as a canopy shade tree. There are many types of Callery pears such as Bradford and Aristocrat and all thrive in tight clay. However, Aristocrat, a recently developed cultivar with a strong central leader, is superior to Bradford and many other Callery pear cultivars that exhibit multiple branching from a single point and are prone to splitting in turbulent winds.

For autumn color accent in parking lots the Chinese Pistache is recommended. It is a taprooted tree that thrives in compacted clay. The foliage is disease resistant and exhibits a brilliant scarlet color in the fall. On the other hand, the Caddo Maple is not recommended for parking lot conditions at OSU because of inadequate moisture, excessive heat, and compacted clay soil. It struggles and dies in OSU parking lots. However, the Caddo Maple thrives in Stillwater when planted in turf areas with supplemental irrigation in the summer. The three Caddo Maples in lot 10 B should be transplanted to turf areas where they will develop their full potential.

Arborvitae thrives in clay soils and is growing successfully as an evergreen screen around the perimeter of several parking lots. Junipers are also successful in parking lot conditions if they are well drained. Both take time to grow high enough for the 6' visual barrier required by Stillwater code to separate parking lots from adjacent residential use. In those instances a wooden fence is recommended as the preferred visual barrier.

Even though the proper species of plant material may have been selected, the design intent will not be met if the material is of the wrong growth pattern or shape. For example street trees and parking lot trees should have strong central leader. This growth characteristic means that the tree will be less likely to break apart in storms and turbulent winds. It should have weak forks pruned out. The V for Victory seen on many OSU trees is an undesirable fork condition which could have been eliminated through corrective pruning in young trees or selection of trees without this condition. Street trees and parking lot trees should have 6 to 8 feet of clear trunk between the ground and the first branch. As the tree matures, the lower branches can be pruned to about 15 feet above the ground. For this reason small growing shade trees are not good street or parking lot trees.

A number of trees growing on the OSU campus have low weak forks or multiple branching from a single point. Both of these conditions are undesirable in shade trees, street trees, or parking lot trees. The fact that there are so many specimens of Lacebark Elm on campus with low branching or weak forks has led many people to think that is the way all Lacebark Elms are. However a trip to any large reputable wholesale tree farm growing Lacebark Elm on a large scale will show that specimens with strong central leaders and high branching conditions are available in larger sizes (3 1/2" or greater) for commercial planting.

The poor branching form on many parking lot and street trees on the OSU campus is, in most cases, the result of poor selection of individual trees. From time to time in the past, OSU researchers working with young trees offered to the Grounds and Labor Department the trees remaining in experimental plots at the conclusion of their studies. That department

sent crews to dig whatever specimens they thought could be used somewhere on campus. The remaining trees were destroyed. The crews did not have the expertise to select young trees having the potential to develop the proper street tree form; consequently, they selected those most appealing to them. These were usually trees having either a V for victory shape or multiple branching from a central point or a generally low branching form. In some instances the trees offered had been previously treated with chemicals to alter their growth habits; and, although the trees looked normal when they were selected, they later developed characteristics not typical of the species.

The street tree and parking lot trees of a University should reflect the high standards and expectations of the public and should not be culls or seconds or otherwise substandard. Although it was commendable that the experimental trees were offered, it would have better served the university in the long run to have rejected them. It would have been far better for the University to have grown its own normal trees of the types desired for street and parking lot use than to accept nonstandard trees, even though they were free for the taking. The selection of properly formed plant materials is so vitally important to the design intent that most landscape architects reserve the final authority to accept or reject the plant material as it is brought to the site prior to installation. In many instances the landscape architect tags the specimens in the field prior to digging to help reduce time lost by digging unsatisfactory specimens.

Because lot 11 has been designated a temporary lot, a few comments regarding the use of quick growing but less desirable tree species in temporary parking lots are offered. Cheap, quick growing, vigorous trees (trash or weed trees) are not usually considered the most desirable trees for long term landscaping applications in public places. However, the use of quick growing trees in temporary parking lots is gaining some favor. Because many city landscaping codes are now requiring 50% shade canopy coverage of parking lot surfaces within 10 years, quickgrowing trees such as Sycamore are displacing more

traditional trees for that application (Figure 43). Other examples of such quick growing trees are the thornless Osage Orange, the fruitless white mulberry, and the soft maple.

Soft maples are vigorous growers, available in large quantities, and are cheap. Because they are surface feeders and have high moisture requirements, they grow better in gravel parking lots than those sealed by asphalt or concrete. However, some city codes prohibit planting or propagation of soft maples because of their invasive roots and abundant seed.

Male Thornless Osage Orange and fruitless white mulberry are fast growing but are not available to the trade in great quantity. They are more labor intensive to produce than the common Sycamore or soft maple because they are grafted.

Many have not considered the common Sycamore to be suitable for dry land applications because it is found in nature along river bottoms. However, the Sycamore has been found adaptable to dry conditions when transplanted from dry, upland tree farms instead of from riverbottom tree farms. The Sycamore has a desirable strong central leader, can be easily trimmed to appropriate clear trunk height, is widely available to the trade in large numbers and is relative inexpensive.

Public areas planted in Sycamore require periodic maintenance because the Sycamore tree sheds leaves, small twigs, and bark throughout the entire growing season. On a public lawn without periodic maintenance the accumulation of debris becomes noticeable. However, in parking lot applications, the daily automobile traffic grinds and pulverizes the tree debris so that the effect is minimized. To many planners the rapid growth rate of the Sycamore shade canopy compensates for its litter in parking lot situations. Figure 43 shows Sycamores used in very narrow planting medians at the Bank of Oklahoma's downtown Tulsa drive through banking facility.

Three target lots were selected for visual and climatic enhancement designs. However, until changes occur to existing administration policy and organization, merely proposing such enhancements will not itself solve the visual problems of the campus.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

A post occupancy evaluation of OSU parking lots was conducted to determine and record current conditions. The evaluation consisted of interviews with campus personnel involved with campus parking in various capacities, study of campus and City of Stillwater documents related to parking and its regulation, on-site inspections of parking lots documented by over 600 photographs, documented walking times from several parking lots to the central area of the campus, and a 12 hour video site surveillance. Many problems were discovered and solutions to some of them have been proposed.

Parking recommendations in the most recent campus master plan (CDC) have resulted in the loss of large numbers of surface parking spaces while even more have been lost through building projects not even considered in the master plan. While the CDC provided for replacement of some lost parking space by erection of parking garages on the campus, these have not been built and there appears to be little likelihood of this being done in the near future. Some lost parking space has been restored in the form of new parking lots, all of the type designated as "temporary". These new lots as well as the majority of the older surface lots showed little evidence of any attempt to provide any aesthetic quality in their design. The few in which trees had been planted in the median have been neglected in most cases with numerous instances of dead, dying or broken off trees. Many of the older parking lots on campus have been poorly maintained and few follow codes of the City of Stillwater with regard to screening from the street or from nearby residential areas. The

overall design of parking lots on the campus, particularly in areas open to public view, contributes little to creating a favorable impression of the campus for visitors.

Enhancement designs for several parking lots have been proposed by others as part of overall designs for new buildings on the campus, but few of these have been implemented. As a part of this study, proto-typical designs have been developed for three typical surface paking lots on the OSU campus and are included as examples of ways in which amenities may be introduced into parking lots. Other recommendations are discussed in the following section.

The appearance of surface parking lots greatly influences the OSU campus image. Extensive surface parking lots constitute a large part of the OSU streetscape visible from Hall of Fame Avenue, an important east-west corridor through Stillwater. With the completion of the extension of Hall of Fame to Perkins road, traffic along the heavily traveled four lane street will become even heavier. The expansion of a large shopping center at the eastern end of Hall of Fame Avenue will increase its traffic even more.

The great increase in traffic along Hall of Fame has the effect of shifting the front door of the University from the south side to the north side. The University should capitalize on this increased public visibility. Private business and industry certainly take full advantage of such increased public exposure. Recognition of the importance of campus appearance as seen from Hall of Fame and its effect on campus street appeal suggests that strong measures should be taken to improve the visual quality of the campus image along Hall of Fame Avenue. The back door and service entrance image this extended area presents should be discarded as soon as possible and replaced by a landscape that projects stability, dignity and high quality. The perpetuation of temporary conditions along this corridor is counterproductive to a desirable street appeal image. Parking lots along this route should be of high design quality and should not only function well but also present as pleasing an appearance as possible to the public.

The following specific recommendations are made:

1. Importance of visual quality along Hall of Fame should be officially recognized by the University. The *de facto* shift in public exposure from the south side of campus to the north side should be accompanied by a relocation of the campus front door from the south to the north.

2. A bold street tree planting of large shade trees growing in a double row should comprise a formal statement stretching along both sides of Hall of Fame from Duck Avenue to Western Avenue.

3. Because of the hot climate, the parking lots visible from main campus roadways should be heavily shaded by trees. The shade would help mitigate the harsh environment caused by acres of asphalt and the associated heat cone as well as improve the appearance of the lot. Since well designed and tree-shaded public parking lots are important site assets, they should not be hidden behind dense barriers or hedges. With adequate numbers of shade trees, other types of screening are not recommended along curb areas. Irrigation systems should be installed in key lots where loss of trees from lack of moisture is likely to occur.

4. Dense barriers or hedges should not be planted around parking lots where they would be a barrier to pedestrian movement from the parking lot to adjacent sidewalks unless periodic openings are left for pedestrian access. Pedestrian access to adjacent sidewalks should be encouraged because such ready access would decrease mixing of pedestrian and vehicle traffic in the aisles. Attractive pedestrian lighting systems should be provided in and around parking lots, particularly those used after dark. In parking lots which include dumpster locations, the dumpster should be screened from the street as much as possible without interfering with pedestrian traffic.

5. Parking lot interiors should be designed with pedestrian flow patterns as an important consideration. Designs which do not accomodate the pedestrian flow do not

successfully change pedestrian flow pattern. Furthermore, such designs lead to conflicts and accidents.

6. All parking lot surfaces should be striped and should have either a concrete curb median or a double tire stop median. Striping increases the efficient use of a lot's capacity, directs traffic movement and aids in self-enforcement as well as legal enforcement. Widely spaced concrete tire stops in conjunction with diagonal parking should be discontinued because this combination allows encroachment of the front end of a car either into a driving aisle or into the median. In addition, stops in this configuration are not very durable and frequently are broken or are torn loose from their anchor pins leaving the exposed rebar and disintegrating concrete to pose a danger to both pedestrians and vehicles.

7. Post occupancy evaluations should be conducted periodically to insure that actual use and the design content are mutually suited to each other. Any enhancement plans developed should be properly installed and maintained in order to be effective. Just as cities have code enforcement departments to enforce building, fire and site design requirements, the University should have an effective system of inspection and continued supervision, not only of its buildings but also its landscape. Single tire stop medians should be converted to double tire stop medians.

8. Parking lots on the OSU campus should be regarded as important image forming assets as well as practical necessities. The installation and maintenance of landscaping should be equally as important in parking lots as on the rest of the campus. Among the first and last impressions received by visitors to the OSU campus are those formed by the area in which they park. Poorly maintained parking lots do not meet the public's expectations of what an established, well-run, and credible institution should provide. Poorly designed and maintained parking areas leave the visitor with a bad impression and undermine the university's credibility.

9. There should be established a clear delineation of responsibility for both the supervision of frequent periodic inspections of landscaping installations and the

replacement of dead, dying or missing plant materials. Many of the observed deficiencies in parking lots as well as other parts of the campus appear to the result of lack of such a definition of responsibility.

10. Because trees represent a considerable financial investment which increases as time passes, a complete inventory of street trees and parking lot trees should be taken. Certain trees on campus are rare specimens because they are not commercially available in the trade. As these trees acquire large size they will become virtually priceless. Therefore, when trees must be removed due to construction, exceptional plant materials should be relocated to another place on campus. The cost to relocate a tree is minimal compared to the cost of acquiring the same size and quality of specimen on the market. Urban foresters in Oklahoma City and Tulsa specialize in the relocation of very large sized trees and should be consulted before large plant materials are destroyed. Construction demolition plans should be reviewed by a campus landscape architect in order to prevent the wanton destruction of the university's rare plant material. If there is no need for such materials in another location on the campus, the university should consider selling them at auction.

11. Because of the many changes the University makes in its site, an accurate survey is necessary to establish accurately the relationship of spaces to buildings as well as the campus whole. Therefore an accurate campus topographic survey should be maintained by the university. Planning efforts are often wasted when accurate site information is obtained only after the start of a project. The pending removal of the printing facility on Monroe to make room for Phase II of the Noble Center is a case in point. Reliance on as-built surveys provided in the past by contractors after finishing a building has not provided good overall campus mapping information. Areas between buildings are often lacking in survey data.

12. All site maps should be field-checked for accuracy. Symbolic site plans and parking schematics are <u>not</u> accurate survey maps and should not be represented as such. Accuracy of parking lot site information is frequently down played but is important for proper lot design. A mistake of a foot can mean the loss of one stall or the loss of an entire

row of stalls. In one case a survey error of ten feet resulted in a bid for more asphalt than was actually installed in one parking lot. This translated into a loss of the actual number of stalls and a waste of money which could have been used to provide shade trees for the lot.

13. The current university policy under which plant materials are installed by the Grounds and Labor department may be not be the most efficient. Reputable commercial landscape contractors use personnel knowledgable of correct techniques for the installation and protection of plant materials, and they guarantee their installations. To the extent that the University buys plants from a nursery and does its own installation, any apparent savings may actually be a false economy in the long run.

14. A major problem with the management of parking facilities on the OSU campus is the fragmentation of administrative responsibilities among several individuals and groups. The result is that there is no overall coordination of construction, design, regulation and evaluation of this important aspect of the campus scene. Furthermore, there is no one responsible for insuring that, insofar as possible, the aesthetic aspects of parking facilities are given serious consideration. Therefore, it is recommended that there be established an overall management functionary concerned with overseeing and coordinating all planning, design, installations, and maintenance of the visual appearance of the entire campus. This function could be conducted in a new office for Campus Landscape Development and would include parking lots among other features of the physical layout of the campus.

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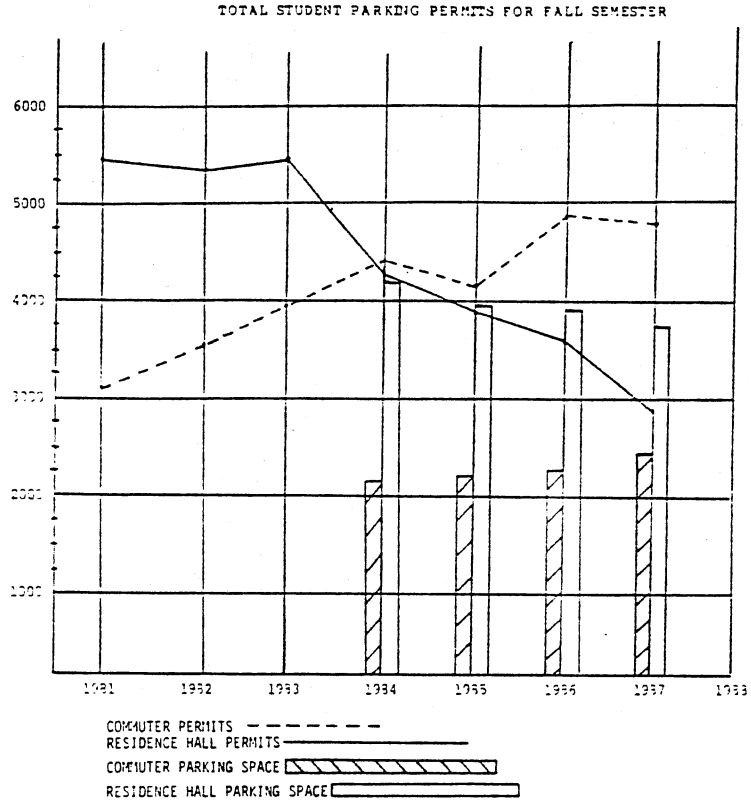
APPENDICES

APPENDIX A

TOTAL STUDENT PARKING PERMITS FOR FALL SEMESTER


TOTAL STUDENT PARKING PERMITS FOR FALL SEMESTER
6000
5000
1981
1982
1983
1984
1985
1986
1987
1988
COMMUTER PERMITS
RESIDENCE HALL PERMITS
COMMUTER PARKING SPACE
RESIDENCE HALL PARKING SPACE

APPENDIX B

PROPOSED 1987/88 PARKING, STREET AND SIDEWALK PROJECTS

PROPOSED 1987-88 PARKING STREET AND SIDEWALK PROJECTS

(Listed in order of need)

1.	Lot 9 – Drainage and entrance improvements, walk and ramp at northeast corner	$ 8,000
2.	Lots 3 and 4 – Reconstruct an combine	146,300
3.	Lot 57 and west one-third of 43 – Overlay	17,000
4.	Lot 10 – Northwest corner, relocate entrance, add curb, gutter, and overlay	42,150
5.	Lot 638 – Repair and overlay	1,500
6.	Lot 26 – Add curb, gutter, and overlay	55,000
7.	Sidewalks	24,860
8.	Lot 19 – Repair and overlay	7,500
9.	Lights	25,000
10.	Gates	15,000
11.	Morrill Avenue – New bike lane and overlay	40,150
12.	Hester Street – Roto mill and overlay	56,800
	Total	$439,260

(Source: Mr. Everett Eaton, Chief, OSU Campus Parking & Security.)

APPENDIX C

PARKING ARTICLES FROM LOCAL NEWS MEDIA

SOURCE: DAILY O'COLLEGIAN, FEB. 26, 1988, STILLWATER, OKLA.

Living groups have head-on collision

OCSA, RHA battle for parking lot

by Linda Walker
Staff Writer

The fate of conflicting parking recommendations submitted by two living group organizations, may be decided this morning by the Parking Rules and Regulations committee.

Representatives from the Residence Halls Association and the Off Campus Student Association met Thursday to discuss parking, but could not reach a compromise on lot 52. Both organizations want the use of the lot between Iba Hall and Agricultural Engineering.

In its recommendation to the parking committee, RHA suggested the lot, an area designated for both off campus and residence halls students, be reserved solely for hall residents.

A counter-recommendation OCSA unanimously passed Monday suggests the lot remain as it is.

Richard Jones, author of the OCSA proposal, plans to bring it up at the parking meeting today.

"It's a little unreasonable, in my opinion, to take the spaces off campus students are using," he said. "Their population has been declining the past few years while ours has at least been holding steady and I don't think they need more."

Jones said the lot should not go to the residence halls because it "severely limits" commuter parking on the west side of the campus.

Another reason OCSA wants to keep their part of the lot is because the university plans to use commuter parking space for future building projects, such as the International Trade Center.

"We're not asking for parking in front of our classrooms - that would be outrageous. But we need some parking near campus because many students have to drive to class,"

See page 3

Parking lot

Continued from page 1

Jones said. "I don't mind the residence halls students having parking close to their dorms - they deserve that - but we have to have some parking close to campus."

He said Lt. James Moser, parking manager on the committee, had conducted a survey which showed some of the lots now reserved for the residence halls had empty spaces. Jones said one way RHA may be able to solve its parking problem is by better utilizing the spaces they have.

James Milton, parking committee representative for RHA, said residence hall parking was under-utilized because of poor planning last year. He said the RHA recommendation to be voted on today was part of an effort to re-zone the lots more efficiently.

"It's true that we're not utilizing every space we have and that's because of zoning problems," he said. "We're waiting for this parking recommendation to go through before we re-zone, and I can guarantee that we will use every space that we get."

Another goal RHA hopes to reach by its recommendation is to bring all parking for hall residents to the south side of Hall of Fame Avenue, Milton said.

"I believe we will get the Iba lot (lot 52) to bring all the residents on this side of Hall of Fame," he said. "I'm very sympathetic with off-campus students and I know they have parking needs, but the fact is our students live there and they have to go to their car 24 hours a day. With off campus students, it's just during class hours."

He said if RHA got lot 52, they would offer lot 74, north of Hall of Fame, to OCSA.

In addition to lot 52, the RHA recomendation also wants a staff lot south of Drummond converted into hall parking, and the first two rows of lot 74, now reserved for commuters, to be designated for freshmen. Jones said OCSA had no problem with that part of RHA's recommendation.

One problem Milton said RHA had been having with trying to re-zone parking was a lack of interest from hall residents.

"Parking is an issue that nobody gives a damn about until it comes to their space," he said. "There's a lack of motivation when it comes to telling us what they want."

Concern For Football Parking

Regents Approve Center Site

A site for Oklahoma State University's Center for International Trade Development was approved by the University's Board of Regents at its regular monthly meeting here Friday.

The site lies on the northeast corner of the intersection of Hall of Fame Avenue and Washington Street.

The site, located just north of Cordell Hall, received the highest evaluation of several evaluated by the architectural firm of Murray Jones Murray, Tulsa, which had been selected as project architect by the Board of Regents in February 1987.

Regents John Montgomery, Poteau, and Austin Kenyon, Muskogee, expressed some concern that the construction project will eliminate 275 prime parking spaces adjacent to the OSU football stadium.

OSU officials noted that construction on the center will not begin until the fall of 1988, so the parking spaces are safe for this season.

And, although no immediate plans exist to replace the 275 parking spaces, the university owns rental property north of the stadium that can be cleared for additional parking over the next few years, said OSU President Lawrence Boger.

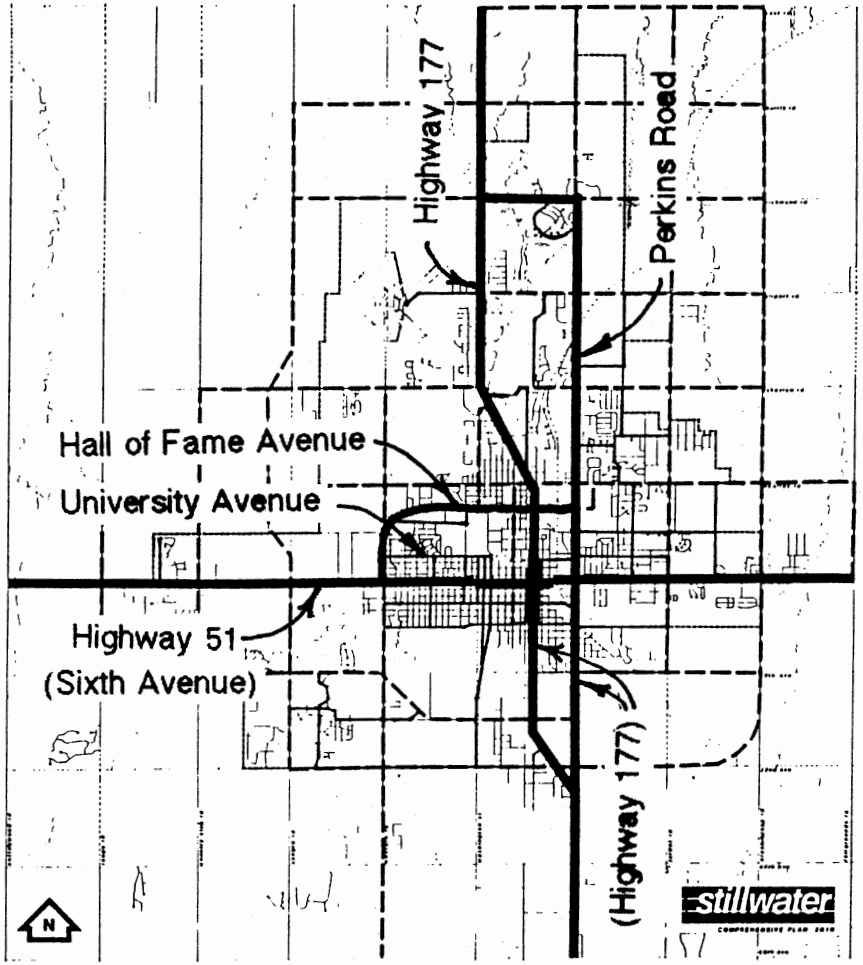
The site evaluation report noted that location's physical characteristics give "high first impression visibility" and can easily accommodate future growth. Completion of the $10 million facility is expected within four years.

In other action, the Board approved $440,000 in repairs to campus parking lots and drives.

Included was overlaying and making a new bicycle lane along Morrill Avenue; overlaying Hester Street; reconstructing, overlaying, improving walks and entrances, and making miscellaneous repairs in eight parking lots; improving lighting in several parking lots; and constructing a sidewalk along Hall of Fame Avenue.

APPENDIX D

OSU CAMPUS LOCATION MAPS

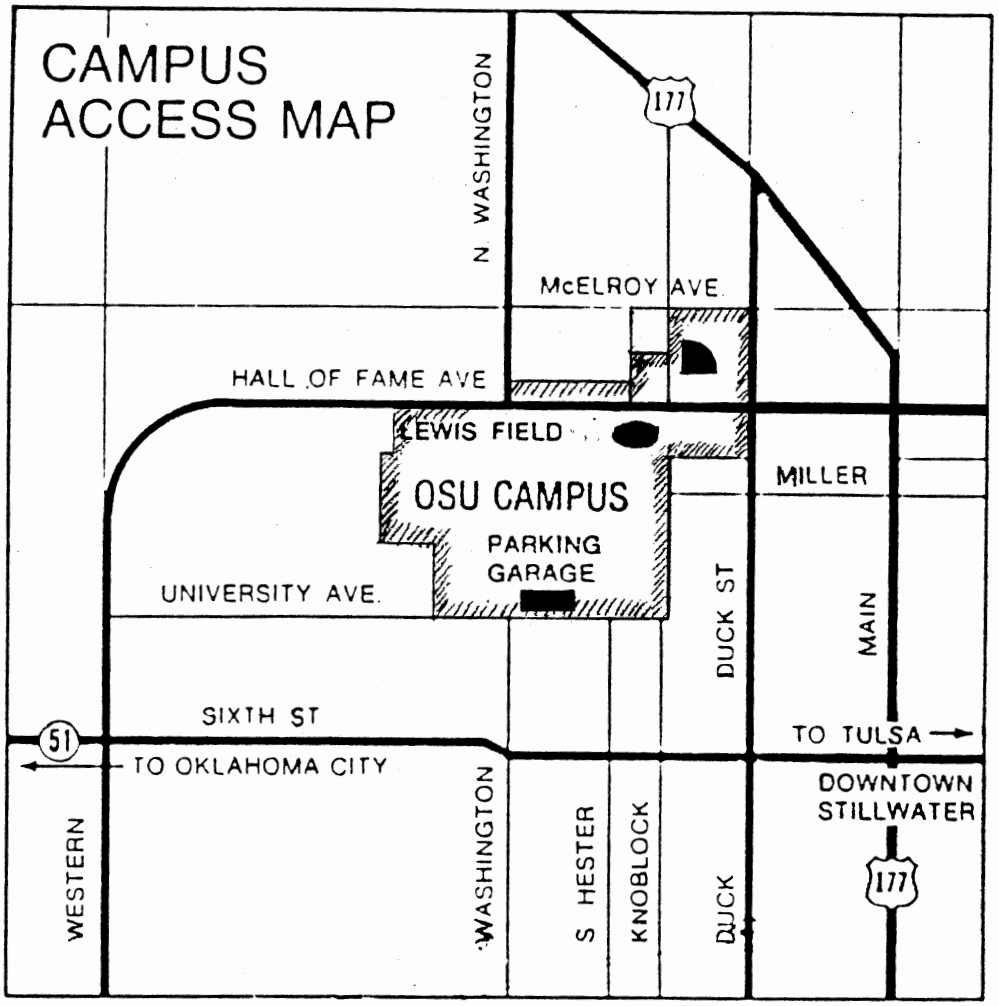


principal arterial streets

minor arterial streets

collector streets

sources: city of stillwater, department of community development, 1986, and city of stillwater transportation study, 1973


CAMPUS
ACCESS MAP
N WASHINGTON
177
McELROY AVE.
HALL OF FAME AVE
LEWIS FIELD
OSU CAMPUS
PARKING
GARAGE
MILLER
UNIVERSITY AVE.
DUCK ST
MAIN
SIXTH ST
51
TO TULSA
TO OKLAHOMA CITY
DOWNTOWN
STILLWATER
WESTERN
WASHINGTON
S HESTER
KNOBLOCK
DUCK
177

VITA

Annice Clare Matthews Ellis

Candidate for the Degree of

Master of Science

Thesis: A STUDY OF PARKING AT OKLAHOMA STATE UNIVERSITY AND RECOMMENDATIONS FOR ENHANCEMENTS

Major Field: Landscape Architecture

Biographical:

Personal Data: Born in Flint, Michigan, February 17, 1944, the daughter of Seth Hayden and Mary Alice Matthews.

Education: Attended Muskogee Central High, Muskogee, OK. Accepted at University of Oklahoma, Norman, OK, Fall 1961 in lieu of high school senior year and received Bachelor of Science Degree in June, 1966; completed requirements for Master of Science degree at Oklahoma State University in July, 1989.

Honors and Professional Societies: Sir Alexander Fleming Scholarship, Oklahoma Medical Research Foundation, Summer 1961, Oklahoma City, OK; National Science Foundation Undergraduate Research Scholarship, Summer 1962, St. Georges Biological Station, Bermuda; State 4-H Alumni Award, 1978, Stillwater, OK; 4-H Chaperone Coordinator, Japanese Labo Exchange, June-August, 1981, Tokyo, Japan; OSU School of Architecture China Study Trip, May-August, 1985, People's Republic of China; Christine Salmon Graduate Design Award, 1986, OSU; Treasurer, OSU Student Chapter, American Society of Landscape Architects, 1986-1987; SLEP, Seminar on Documentary Photography, October, 1987, OU; Tulsa Iris Society Graduate Scholarship, 1987-1988, OSU; President, Alpha Delta Chapter, Sigma Lambda Alpha, National Honor Society for Landscape Architects, 1987-1988; American Society of Landscape Architects Award of Merit, 1988; Member, Gamma Sigma Delta, National Honor Society for Agriculture, 1988; Member, American Society of Landscape Architects, 1988; Member, Phi Kappa Phi, National Scholastic Honor Society, OSU, 1989.

Professional Experience: Graduate Teaching Assistant, Department of Horticulture and Landscape Architecture, OSU, August, 1986 to May, 1988; Draftsman, A. C. Hall Surveying, Tulsa, OK, June to September, 1988; Landscape Designer, The Jacob Braun Co., Tulsa, OK, September, 1988 to April, 1989; Landscape Architect, U. S. Forest Service, Hot Springs, AR, April, 1989 to present.

Plate 1.
Campus Parking Map
effective August 15, 1985

A STUDY OF PARKING AT OKLAHOMA STATE UNIVERSITY AND RECOMMENDATIONS FOR ENHANCEMENTS

Annice Ellis, May, 1989

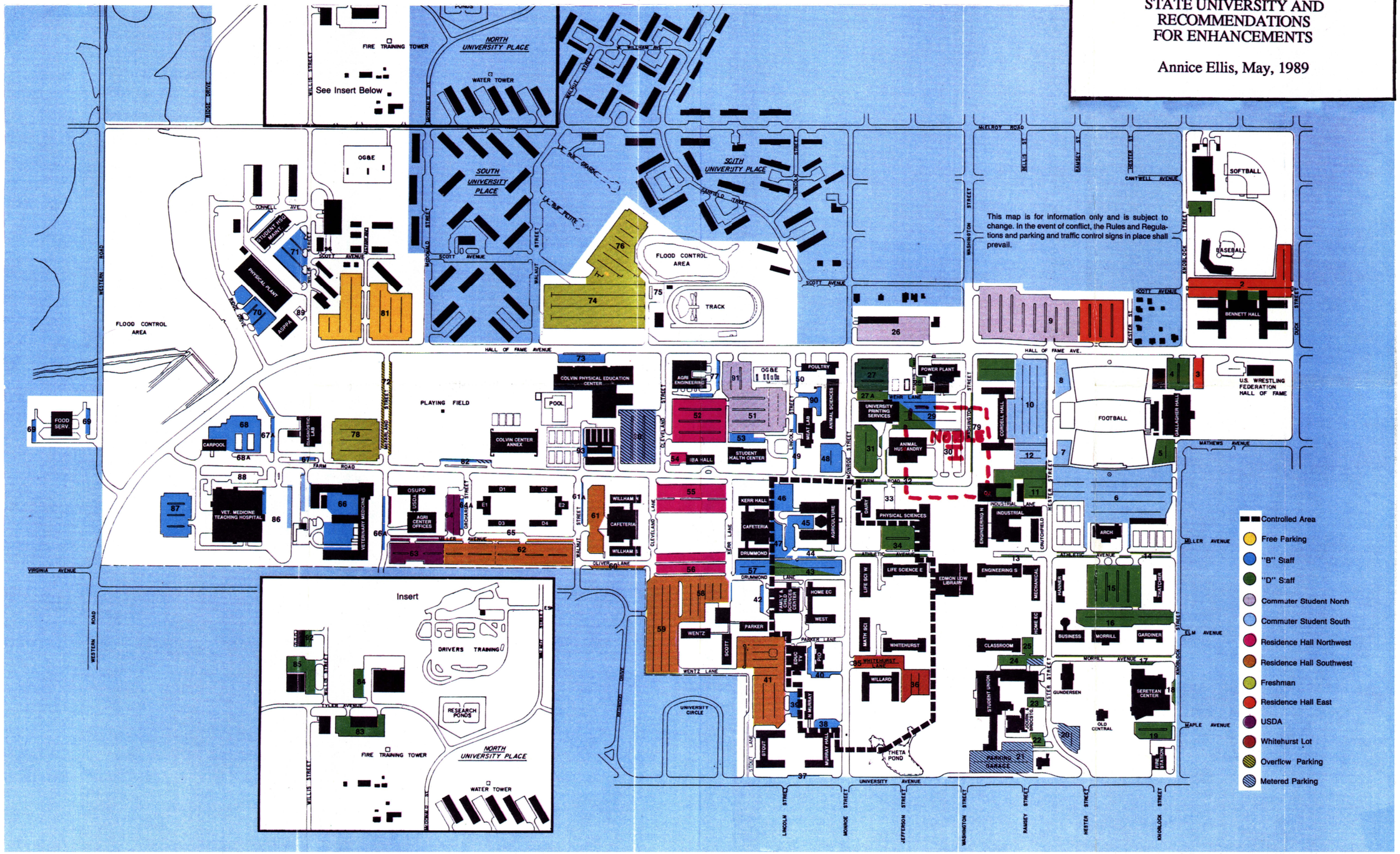


Plate 2.
Campus Parking Map
effective August 15, 1987

Thesis
1989
EN75
cop.2

A STUDY OF PARKING AT OKLAHOMA STATE UNIVERSITY AND RECOMMENDATIONS FOR ENHANCEMENTS

Annice Ellis, May, 1989

PHOTOGRAPHS ARE FROM LOTS CIRCLED IN RED

This map is for information only and is subject to change. In the event of conflict, the Rules and Regulations and parking and traffic control signs in place shall prevail.

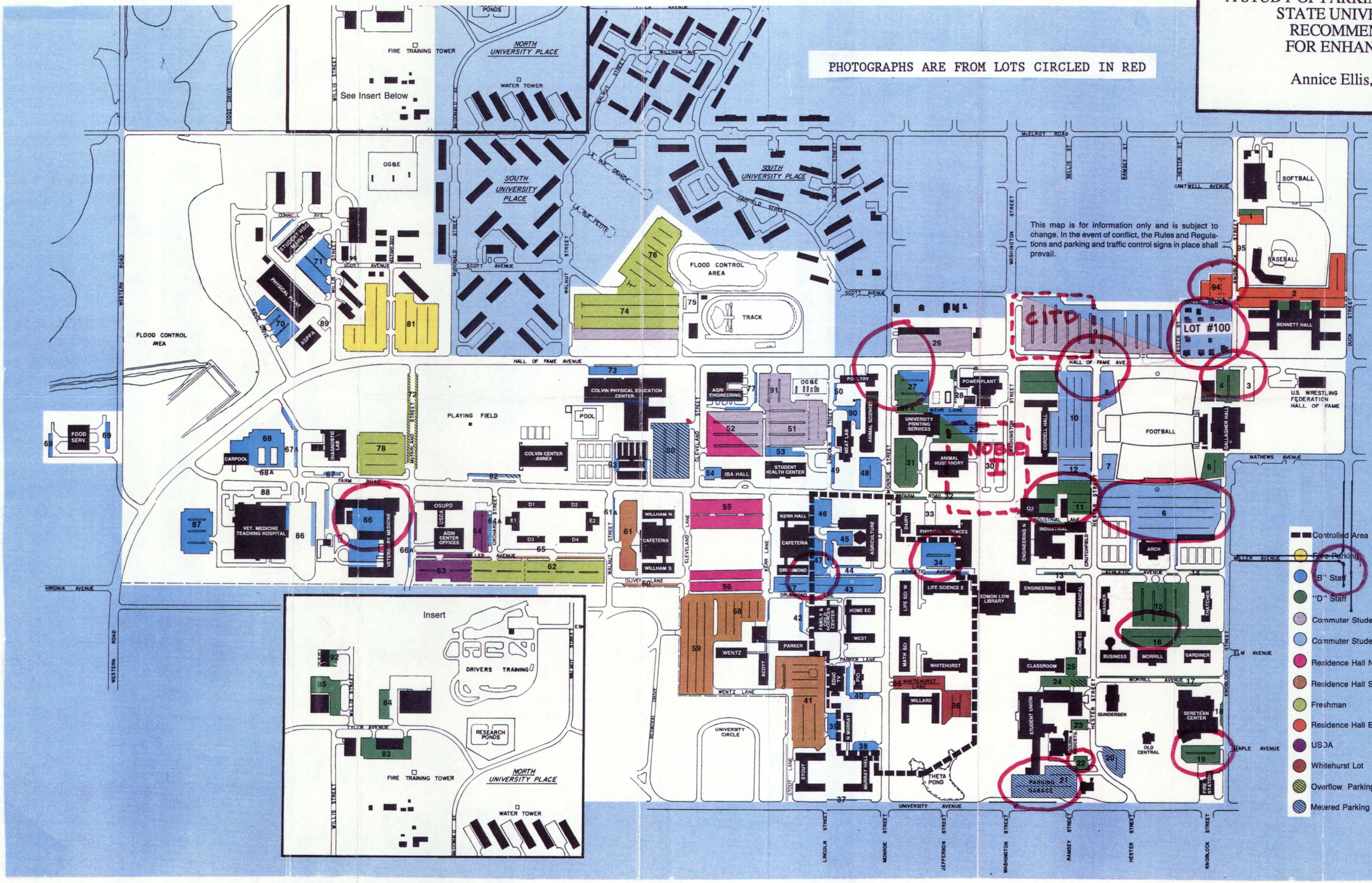


Plate 3.
Campus Parking Map
effective August 15, 1988

Thesis
1989
E477s
cops

A STUDY OF PARKING AT OKLAHOMA STATE UNIVERSITY AND RECOMMENDATIONS FOR ENHANCEMENTS

Annice Ellis, May, 1989

TARGET LOTS CIRCLED IN RED

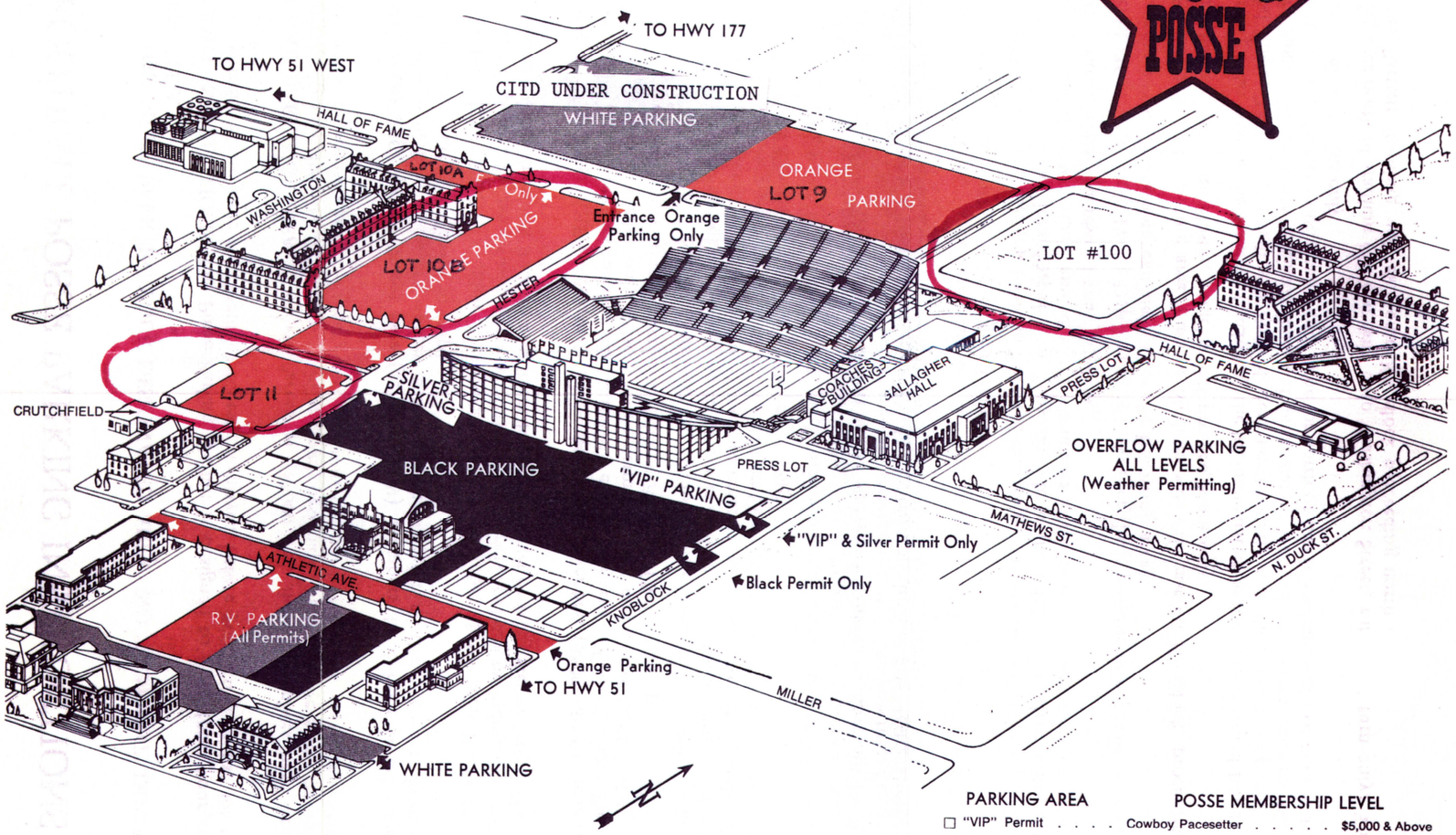
This map is for information only and is subject to change. In the event of conflict, the Rules and Regulations and parking and traffic control signs in place shall prevail.

LOT #100

Insert

Controlled Area
"B" Staff
"D" Staff
Commuter Student Norh
Commuter Student South
Residence Hall
Residence Hall
Residence Hall
Residence Hall East
USDA
Whitehurst Lot
Overflow Parking
Metered Parking

1987 FOOTBALL POSSE PARKING



PARKING AREA	POSSE MEMBERSHIP LEVEL	
□ "VIP" Permit	Cowboy Pacesetter	$5,000 & Above
□ Silver Permit	Pistol Pete	$2,500—$4,999
■ Black Permit	Golden Spur	$1,000—$2,499
■ Orange Permit	Silver Spur	$ 500—$ 999
	Marshal	$ 250—$ 499
■ White Permit	Sheriff	$ 100—$ 249

Plate 4.
1987 Football Posse Parking Map

A STUDY OF PARKING AT OKLAHOMA STATE UNIVERSITY AND RECOMMENDATIONS FOR ENHANCEMENTS

Annice Ellis, May, 1989

TARGET LOTS CIRCLED IN RED