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MINNESOTA ZOOLOGICAL GARDEN
AND
MINNESOTA DEPARTMENT OF TRANSPORTATION

FINAL ENVIRONMENTAL IMPACT STATEMENT

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For: MINNESOTA ZOOLOGICAL GARDEN
AND RELATED ZOO ACCESS ROADS
DAKOTA COUNTY, MINNESOTA

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State of Minnesota
Minnesota Zoological Board
and
Minnesota Department of Transportation

FINAL ENVIRONMENTAL IMPACT STATEMENT

for
Minnesota Zoological Garden
(Including Zoo Access Roads)
Dakota County, Minnesota

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STATE OF MINNESOTA

Prepared by:
The Minnesota Zoological Board

And Assisted by:
The Minnesota Department of Transportation

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Portions of this Statement have been prepared by the following organizations:

Organization	PAGE(S)
Hickok and Associates	31
InterDesign, Inc.	Appendix 1
Midwest Research Institute	Appendix 17
Real Estate Research Corporation	Appendices 8, 9, 10, 11, 12, 13
Urban Planning and Design, Inc.	39, 44, 45, 47, 67
ZooTeam, Inc.	Appendices 4, 5, 6

State of Minnesota
Minnesota Zoological Board
and
Minnesota Department of Transportation

FINAL ENVIRONMENTAL IMPACT STATEMENT

for
Minnesota Zoological Garden
(Including Zoo Access Roads)
Dakota County, Minnesota

The Minnesota Zoological Garden Project has been funded by the State of Minnesota pursuant to Minnesota Statutes, Section 85A.01 et.seq., and a Zoo Access Road has been approved by the State of Minnesota to be constructed by the Minnesota Department of Transportation pursuant to Minnesota Session Laws, 1974, Chapter 265. This statement is submitted pursuant to Minnesota Statutes, Section 116D.01, etseq.

(Date) _____ General Director
Minnesota Zoological Garden

(Date) _____ James Harrington
Commissioner of Transportation

INTRODUCTION

This Final Environmental Impact Statement is directed to the development and use phases of the Minnesota Zoological Garden project. It includes a review of access alternatives as well as the development and use of such access roadways. A detailed discussion of the selected alternate is included on page 24.

The site selection procedure was completed with site approval by the Metropolitan Council on June 25, 1970, pursuant to Minnesota Statutes Section 85A.02, Subd. 2, and Minnesota Statutes Section 473B.06, Subd. 6. This site selection was based upon a review of over 100 locations within the metropolitan area from which four primary sites were reviewed in detail. The site selection was further confirmed by the Minnesota Legislature when funding was authorized by Minnesota Session Laws, 1973, Chapter 207, based upon Legislative review of the development proposed for the Apple Valley site. Therefore, in discussing alternatives to the proposed action, the consideration of alternatives sites is noted but no evaluation of alternative sites is repeated in this statement.

The review process followed by the Metropolitan Council also included a review of the proposed development and use. On February 11, 1971, the Metropolitan Council approved the site development with the understanding that as additional development information was secured, there would be further review by the Metropolitan Council. Informal staff review has been provided since then for basic utilities, primarily waste handling.

These site and development review procedures by the Metropolitan Council were focused on the environmental effects of the site and the development. They were a technique for environmental review and approval prior to the procedures created by the Minnesota Environmental Policy Act of 1973, Minnesota Statutes Section 116D.01 et.seq. The site selection and review process did involve a substantial review of alternatives and did provide opportunity for public participation and debate in the process (see Section I, B). The Minnesota Zoological Board believes the intent of the Environmental Policy Act has been met without an Environmental Impact Statement.

However, the Minnesota Zoological Garden requested the opportunity to submit an Environmental Statement. This was based upon a belief that the public would appreciate the opportunity for review under the new procedures. Further, since more specific development information has been secured and roadway access is an area of concern, there are matters of some substance to review.

Because of the extensive prior review of the site selection, the Statement will focus primarily on site development. This site recommendation summary of the site evaluation is included as an appendices for reference purposes.

The initial Statement was drafted as an Environmental Assessment of the zoo development and use. By resolution approved November 12, 1974, the Environmental Quality Council accepted that initial draft as a Draft Environmental Impact Statement as to the Minnesota Zoological Garden itself and authorized zoo construction to continue, but asked that the statement be expanded to include more detailed information regarding surrounding land use and access roads. An extensive series of meetings involving community and transportation representatives was used to develop this expanded statement. In addition, the surrounding land use was considered in more detail as a Zoo Area Development Guide for local approval (as an amendment to the Community Comprehensive Plans).

Traffic volume projections have been completed by the Minnesota Department of Transportation. These traffic volumes have been used in following sections to discuss the ability of the Selected Alternate to adequately accommodate projected traffic volumes and to evaluate air and noise impacts from the zoo access road.

SUMMARY SHEET

Nature of this Report: Final Environmental Impact Statement

Sponsors: State of Minnesota, Minnesota Zoological Board and Minnesota Department of Transportation

Type of Proposed Action: This project is for the development and use of a zoological garden on a 480 acre site in Apple Valley, Minnesota. The roadway projects necessitated by the zoological garden project include an extension of Minnesota Trunk Highway 36 (Statutory Route No. 279 hereinafter referred to as "Cedar Avenue", "Zoo Road", or County State Aid Highway 23) and some related municipal and county roads. Alignment, development, and use have been considered. Based on analysis and public participation a preferred highway alternate has been selected and is presented in this statement.

Official Title of Proposed Action: Minnesota Zoological Garden

Summary Description of the Proposed Action: The development includes the creation of a new zoological garden on about 480 acres, consisting primarily of former agricultural land.

The design concept is to create a natural garden atmosphere including nature-imitating animal settings, year-round use of outdoor exhibit areas by focus on northern animals adapted to northern climates, and use of zoogeographic exhibit techniques (grouping animals by natural distribution rather than by species relationships). This "new zoo" concept lends itself to education and conservation as well as the traditional recreational use of zoos. Major features will include:

Northern Trek: A sequence of outdoor northern habitats to be constructed as large acreage exhibit areas in two phases. Opening exhibits will display five northern hemisphere species. With completion of Phase II, 15 major animals will be displayed in 10 large acreage exhibit areas contained within concealed barriers.

Main Building and Parking Lot: This visitor entry area includes facilities for public information, education, security, general administration and basic visitor services such as orientation, rentals, and food services. One wing is exclusively exhibit space including:

Oriental Exhibit: A greenhouse-type interior exhibit showing representative plants and animals of the Oriental Zoogeographic Region.

Minnesota Exhibit: Interior and exterior exhibits (including aviary) featuring representatives of Minnesota's animals.

Aquarium: A major Beluga (White) Whale aquarium and a series of smaller aquaria showing marine animal life in tropical, temperate and polar climatic zones.

Also included within the exhibits at the Main Building are a Macaque exhibit and a mini-zoo (childrens or animal contact zoo) and animal nursery.

The Minnesota Zoological Garden will exhibit and attempt to breed several threatened or endangered species. Federal permits, issued by the U.S. Fish and Wildlife Service and foreign government permits will be obtained as required by law for the exhibition and/or breeding of species listed in Appendices 1, 2 and 3 of the Convention of International Trade in Endangered Species of Wild Fauna and Flora.

Internal Services: The shops, greenhouse, maintenance and animal support facilities, including animal quarantine, food and health facilities.

The construction budget is funded by a combination of state bonding funds and non-state contributions to the zoological garden. The $28,855,763 capital budget includes: design and management fees, construction, and animal and equipment purchase.

The facilities will be operated year around. A parking fee and an entrance fee will be charged. The Metropolitan Council established a series of proposed charges to be reviewed by the Legislature; as a result the charges will be as follows:

Adults (17 and over)	$2.50
Children (7 to 16)	$1.25
Children (7 and under)	Free

To allow low income persons to use the zoo, there will be one designated free admittance day per month. Family rates will be established in conjunction with the membership program of the Minnesota Zoological Society.

A fee will be charged for parking as follows: $1.00 per car, $5.00 per bus.

There will be zoo-operated gift stores and visitor service rentals such as strollers and wheelchairs. The food concession will have separate charges as would a privately financed northern trek ride if secured. Attendance is estimated at 2,376,000 per year (within a range of 1,800,000 to 2,900,000 per year) with a peak attendance potential on Memorial Day at 48,000, but anticipated peak day attendance not over 30,000.

Summary of Environmental Effects: The Minnesota Zoological Garden development will alter the existing landscape, vegetation and wildlife habitat on the site, particularly for the parking lot and main building structure. Restoration of the site as a natural zoological garden will mitigate adverse effects on the

natural systems. The zoological garden will be a positive environmental force through programs directed to inform the public about conservation and protection of natural resources. The proposed action should have no significant impact on natural systems within the site.

The effect on the surrounding land use relates primarily to the increased traffic. The location of the proposed action is in accord with long term plans of the City of Apple Valley, the City of Eagan, Dakota County, and the Metropolitan Council. Adequate roadways are being planned by the Minnesota Department of Transportation (MN/DOT), Dakota County, the City of Eagan, and the City of Apple Valley. The proposed action should have no significant adverse impact on social systems and surrounding land use, provided the access roads are constructed to avoid traffic conflicts in residential areas and that local development goals are considered.

Improvements and use of municipal and county roads would be along existing roadway alignments, and will have no significant impact on natural or social systems.

Construction of a state-authorized Zoo Road as an extension of the Cedar Avenue highway (limited access) from the vicinity of the intersection with Interstate 35E south and east to the zoo entry will require some new right of way. This will alter landscape, drainage, vegetation, and wildlife habitat as well as displace some existing homes. Such a roadway will provide a more safe, and compatible transportation facility than the use of existing roadways. If the alignment is along existing (or planned) roadways there should avoid any significant environmental effect.

Summary of Alternatives: The alternatives which have been considered for the Minnesota Zoological Garden include: 1) development as designed, or 2) do-nothing. Any modification in the design of the proposed development would either have a greater environmental impact or would make no significant change in the environmental effects created by any such development. The do-nothing alternative would leave the land open for development, providing a potentially more significant impact on the natural environment, and would mean the loss of education, recreation, and conservation benefits to the area from the proposed action. The continued zoo construction also makes the do-nothing alternative less viable.

The zoo road alternatives considered include: A) South and East along the alignment of existing or protected rights of way; B) East and South through county parkland using almost all new rights of way; and C) South and East along entirely new rights of way. There is also the do-nothing alternative.

Alternative A and B have a greater effect on existing residential structures and relationships.

The new rights of way (alternatives B and C) have a greater effect on the natural systems, and would be more costly and time-consuming to construct. The do-nothing alternative would have a significant impact on the surrounding residential community because of increased traffic on residential roads.

Governmental Responsibilities Related to the Proposed Action: These are responsibilities which should be reviewed to determine whether they apply to or affect zoo development.

Description	Agency	Status
Liquid Fuel Storage	PCA	As Needed
Incinerator Approval	USDA, PCA, Dakota County	As Needed
Heating Plant - Air Quality	PCA	Not Required
Complex Source - Air Quality (parking lot)	PCA	Not Required
Animal Lot Operation	PCA	Completed
Noise Level Permit	PCA	As Needed
Storm and Sanitary Sewer System	Eagan, PCA, Sewer Board, Metro Council	Completed
Fire Protection Plan	Apple Valley Fire Marshall, State Fire Marshall	Completed
Building Permits	Apple Valley Building Inspector	In Progress-Continuing
Electrical Permits	State Electrical Inspector	In Progress-Continuing
Contractor Permits	Apple Valley	In Progress-Continuing
Municipal Road Upgrading	Metro Council, Eagan, Apple Valley	In Progress
Roads - Sign Design and Location	Apple Valley, Dakota County, MN/DOT	As Needed
Zoo Road Design and Alignment	MN/DOT, Apple Valley, Eagan, Metro Council, Federal Highway, FHWA, Dakota County, PCA, DNR, EQC	In Progress
Municipal Permits and Variance (i.e. sign sizes)	Apple Valley	In Progress-Continuing
Surrounding Land Use, Local Zoning, etc.	Apple Valley, Eagan, Metro Council	In Progress-Continuing
Critical Areas Designation for Surrounding Land Use	EQC	Not Required
Comprehensive Plan	Apple Valley	Completed
Rezoning	Apple Valley	Completed
Official Map Designation	Apple Valley	Completed
Zoo Area Development Guide	Apple Valley, Eagan, Metro Council, EQC	Completed
Site Selection Approval	Metro Council	Completed
Site Development Approval	Metro Council	Completed
Zoo Approval	USDA	In Progress
Site Selection	USDA	Completed
Site Designation (rural vs. urban)	USDA	Completed
Animal Inventory (3 mile)	USDA, DNR	In Progress
Animal Care Facilities	USDA	In Progress

Drainage/Water Level Alterations	DNR, USDA	In Progress
Well and Water System Review	Health Department	Completed
Well Registration	Health Department	Completed
Transportation and Placement of Animals	USDA, USDI, DNR, USD-HEW	As Needed
Transportation and Placement of Plants	DNR	As Needed
Solid Waste (composting)	PCA, USDA	In Progress
Historical Site Inspection	Historical Society	In Progress
Animal Trapping on Site	DNR	As Needed

Comments on the Draft Environmental Impact Statement were requested from the following agencies:

*Minnesota Environmental Quality Council
U.S. Department of Agriculture
*U.S. Department of Interior
U.S. Department of Transportation
Minnesota Pollution Control Agency
*Minnesota Department of Health
Minnesota Department of Natural Resources
Minnesota Department of Economic Development
*Minnesota Historical Society
Minnesota Energy Agency
*State Planning Agency
*Metropolitan Council
*Metropolitan Transit Commission
Metropolitan Waste Control Commission
Dakota County Board of Commissioners
Dakota County Engineer
Dakota County Planning Commission
*Apple Valley City Council
Apple Valley City Engineer
Apple Valley Planning Commission
*Eagan City Council
Eagan City Engineer
Eagan Planning Commission
Burnsville City Council
Rosemount City Council
Lakeville City Council
Urban Council on Mobility
Inver Grove Heights Council
St. Paul City Parks Department, Como Zoo
Minnesota Zoological Society

*Indicates agencies responding to the Draft Environmental Impact Statement.

SECTION 1

the proposed action

A. Project Concept and Location.

The Minnesota Zoological Garden will be located in Apple Valley, Dakota County, Minnesota within the seven-county metropolitan area. The zoological garden development is intended to make maximum use of the existing land form. Figure 1 following shows the Master Site Plan as developed in December 1973. Figures 2 and 3 following are perspective drawings showing the current development proposed.

It occupies an area of approximately 480 acres adjacent to the City of Eagan, and within a three-mile radius surrounded by the Cities of Apple Valley, Burnsville, Eagan and Rosemount.

The selected zoo road alternate is approximately two and one-half miles long and the project termini are:

1. In the vicinity of the southeastern entrances of the Minnesota Zoological Garden in Apple Valley.

2. At the junction of Cedar Avenue and proposed I-35E in Eagan.

Figures 4 through 6 following illustrate the general location relative to the surrounding area, and Figure 7 illustrates the surrounding communities within a three to five mile radius, and Figure 8 is an aerial photograph of the general study area around the zoo site with the Selected Alternate A, zoo access road shown.

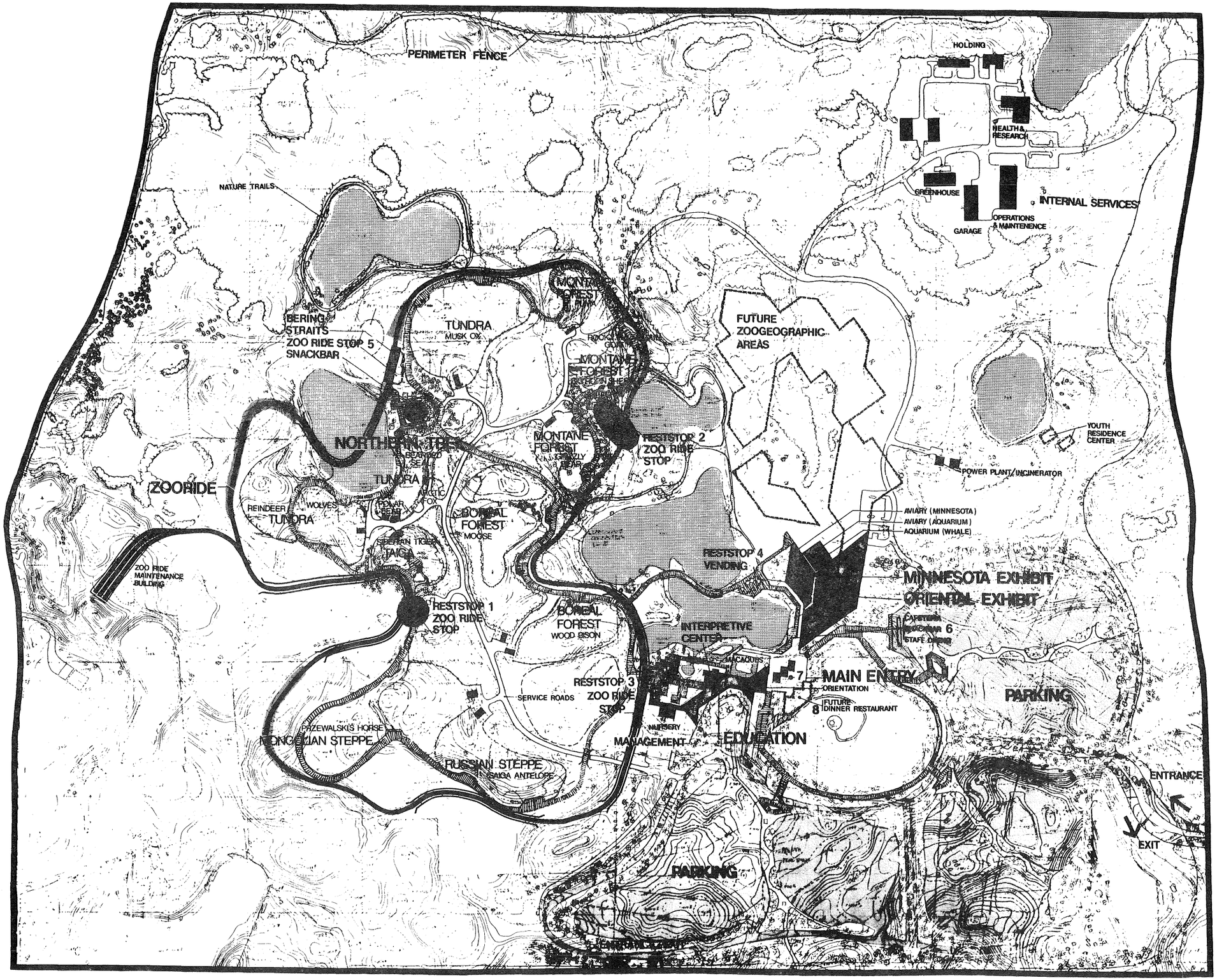
The zoo peripheral area (a one to two mile radius) is almost exclusively developed with residential uses, metropolitan, county or municipal parks and agricultural use.

B. Project History and Status.

Plans for a major innovative zoological garden in Minnesota date back almost half a century. Initial concepts centered around an expanded Como Park Zoo. Subsequent studies by the Minnesota Zoological Society, the Citizens League, and the Metropolitan Council's Zoo Advisory Committee focusing on the need for a metropolitan Twin City area facility were undertaken from 1964 to 1968. Each study concluded that a zoological garden would fill a massive cultural void in the Twin Cities, that it would be economically viable; and that it would bring a host of benefits (as viewed by those completing the study) ranging from increased tourism, to enrichment of educational experiences, to providing a major contribution to "quality of living" standards in the area.

The Metropolitan Council prepared a Development Guide for the proposed zoo. It was intended to be a "new zoo" in concept serving the entire metropolitan area. It would provide large open exhibit areas for the more natural behavior, social groupings, and propagation of the animals. The objectives would be conservation,

FIGURE 1



MINNESOTA ZOOLOGICAL GARDEN

Minnesota State Zoological Board

Master Site Plan SCHEMATIC DESIGN

SHEET NO. 1

- STRUCTURES
- FUTURE STRUCTURES
- PEDESTRIAN CIRCULATION
- ZOO RIDE
- SERVICE CIRCULATION
- EXHIBITIONS
- PARKING
- LAKES
- SHEER WALL
- ROCK WORK
- FENCE
- PERIMETER FENCE
- 9150' ZOO RIDE LENGTH
- ZOO RIDE ELEVATED
- ZOO RIDE ON GRADE
- ZOO RIDE IN CUT OR FILL

0 100 300 500 N

FIGURE 2

MZG

MINNESOTA ZOOLOGICAL GARDEN

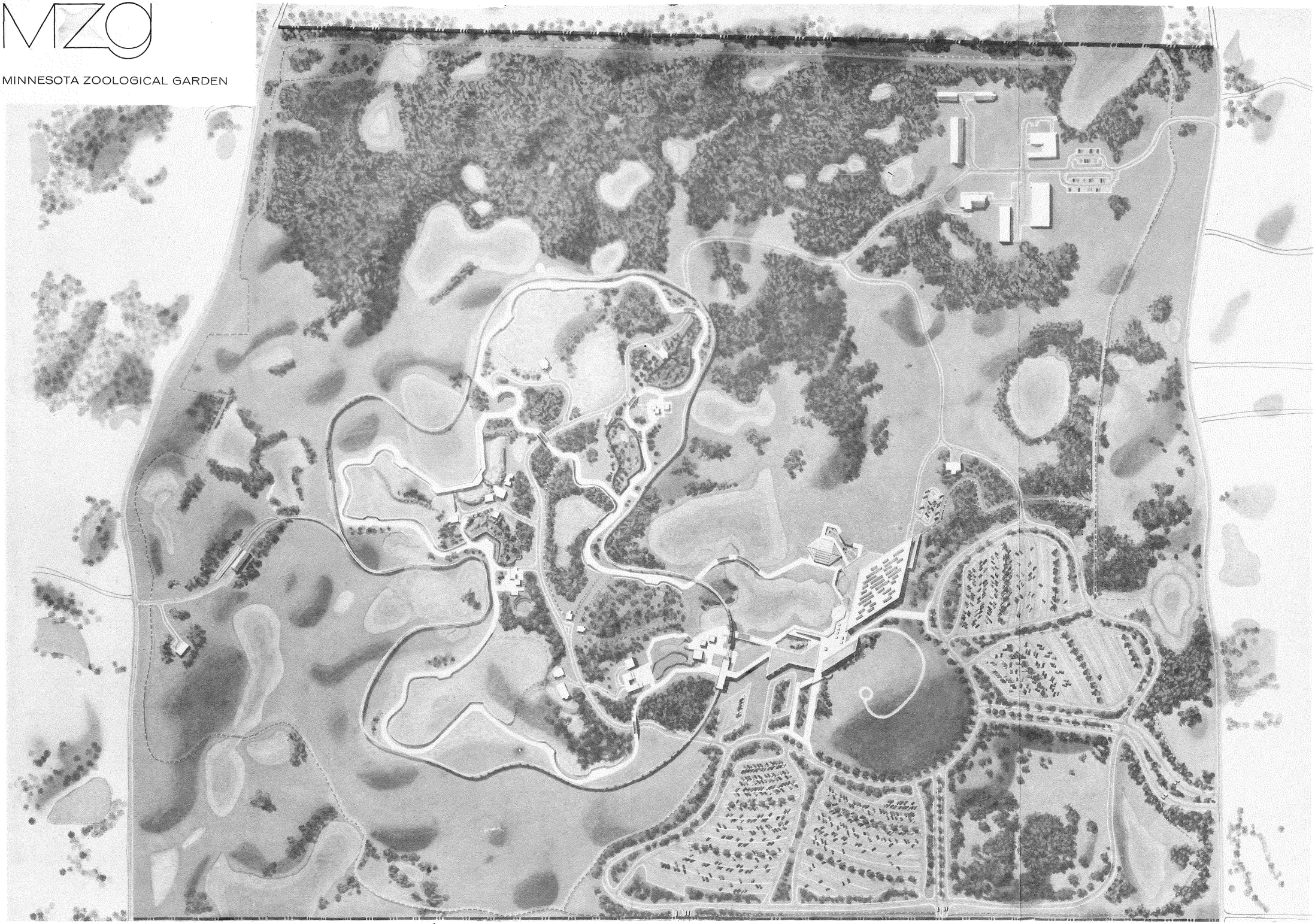


FIGURE 3

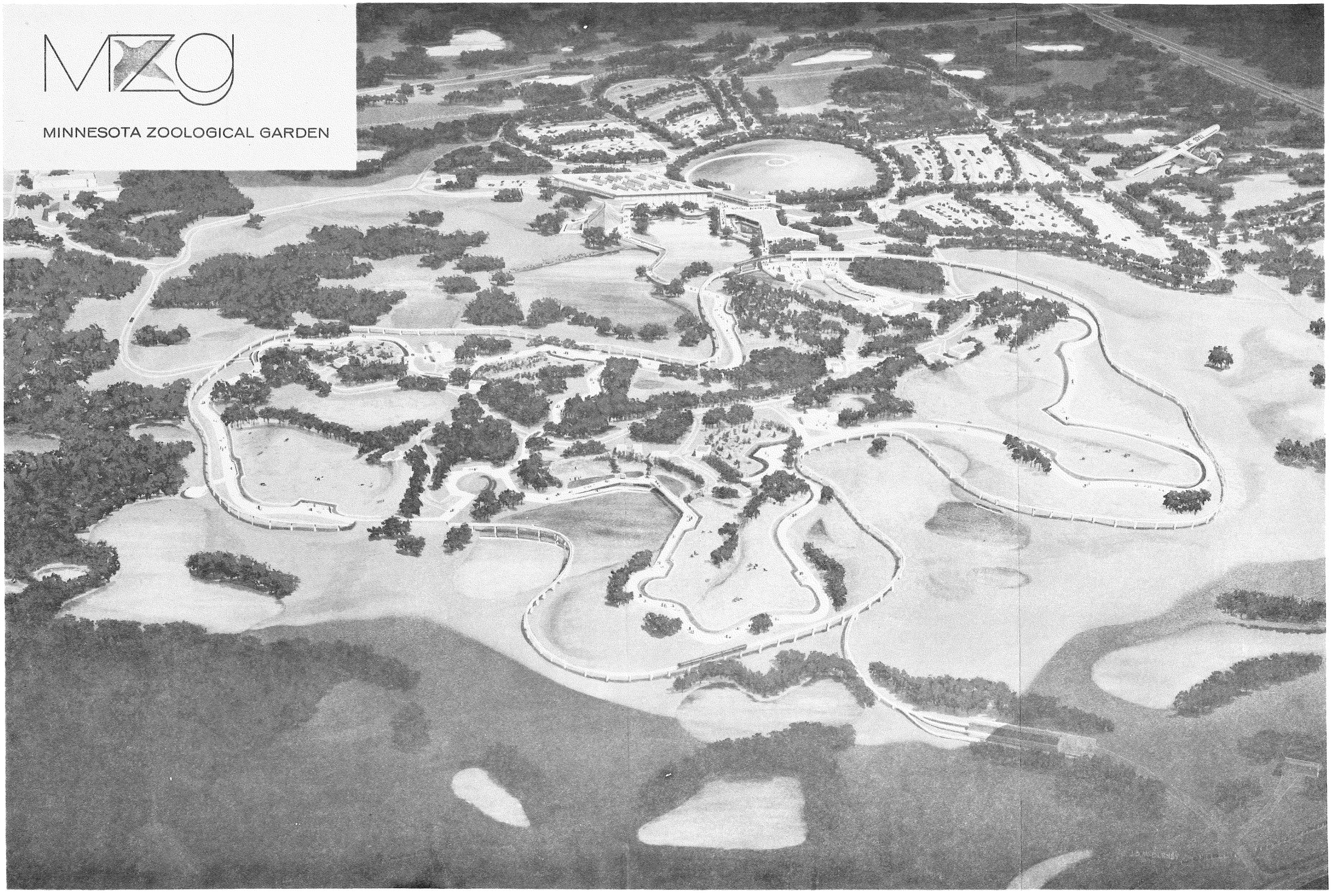
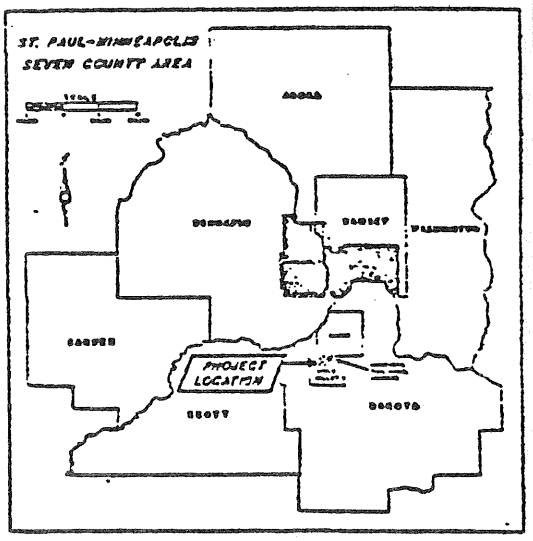


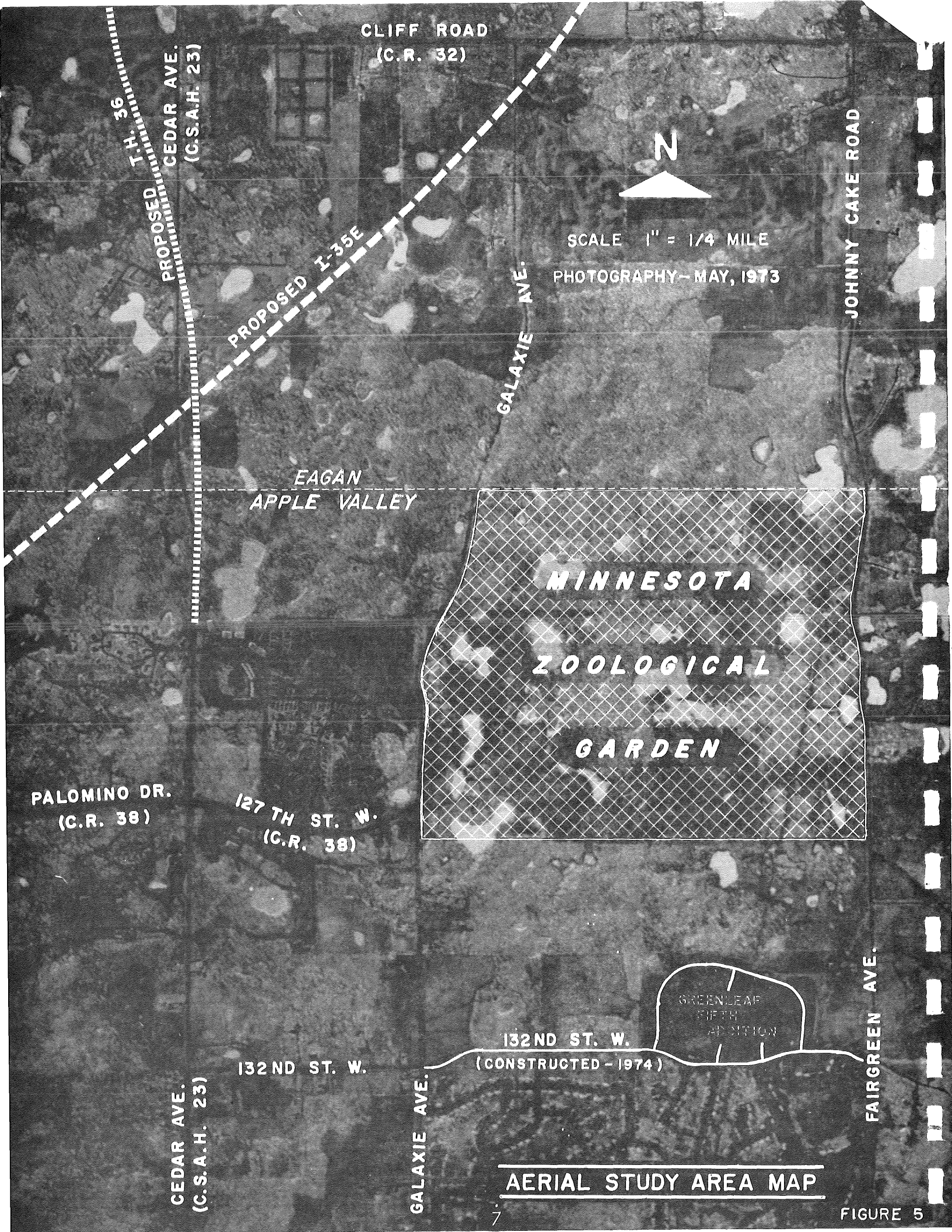
FIGURE 4

MINNESOTA ZOOLOGICAL GARDEN
AND ZOO ACCESS ROAD
PROJECT LOCATION MAP



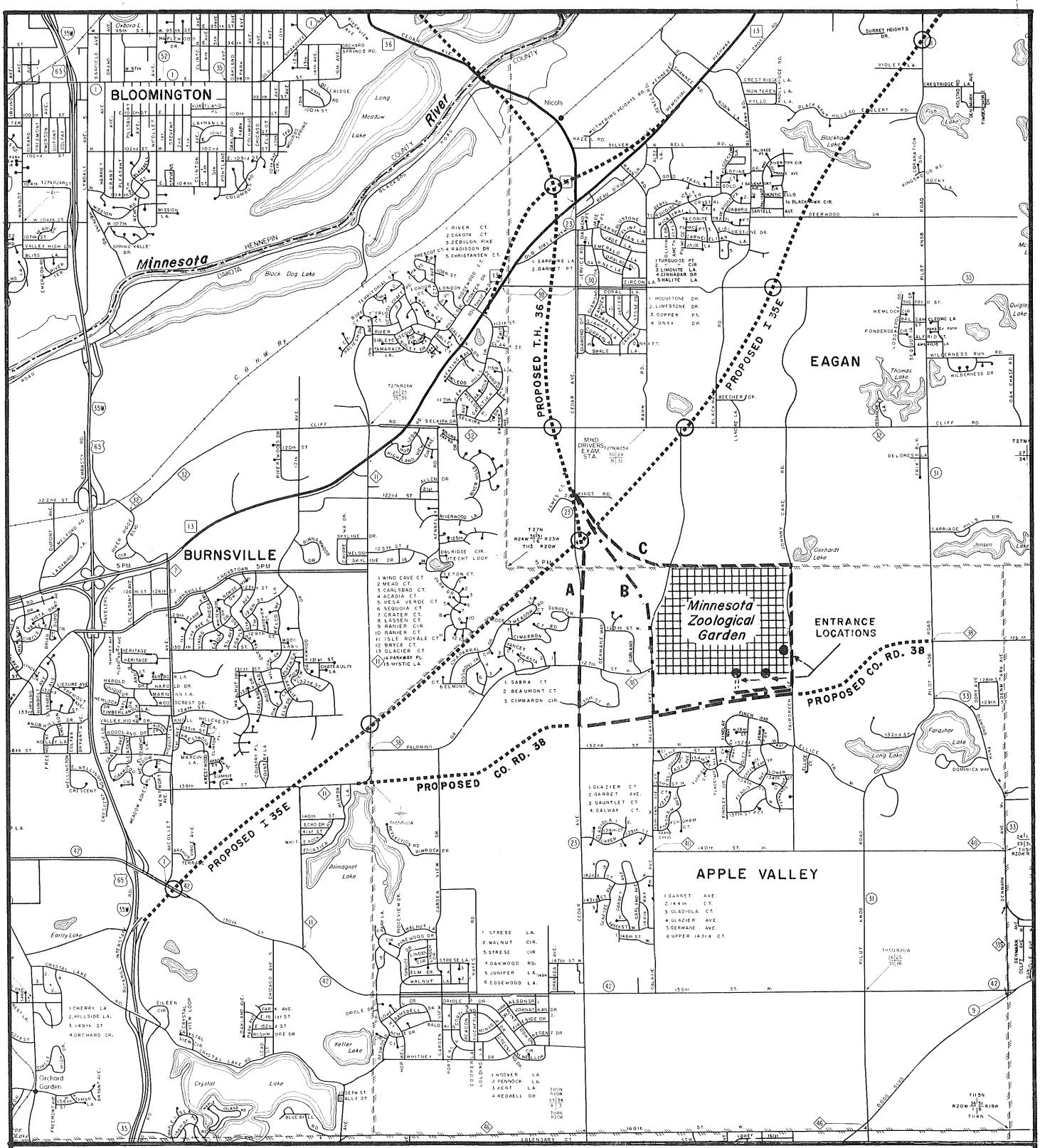
PROJECT LOCATION

INDEX MAP



AERIAL STUDY AREA MAP

FIGURE 5



ZOO ACCESS ROAD

PROPOSED CORRIDOR LOCATIONS

- **ALTERNATE A**
- **ALTERNATE B**
- **ALTERNATE C**

OTHER PROPOSED HIGHWAYS

INTERCHANGE LOCATIONS

N

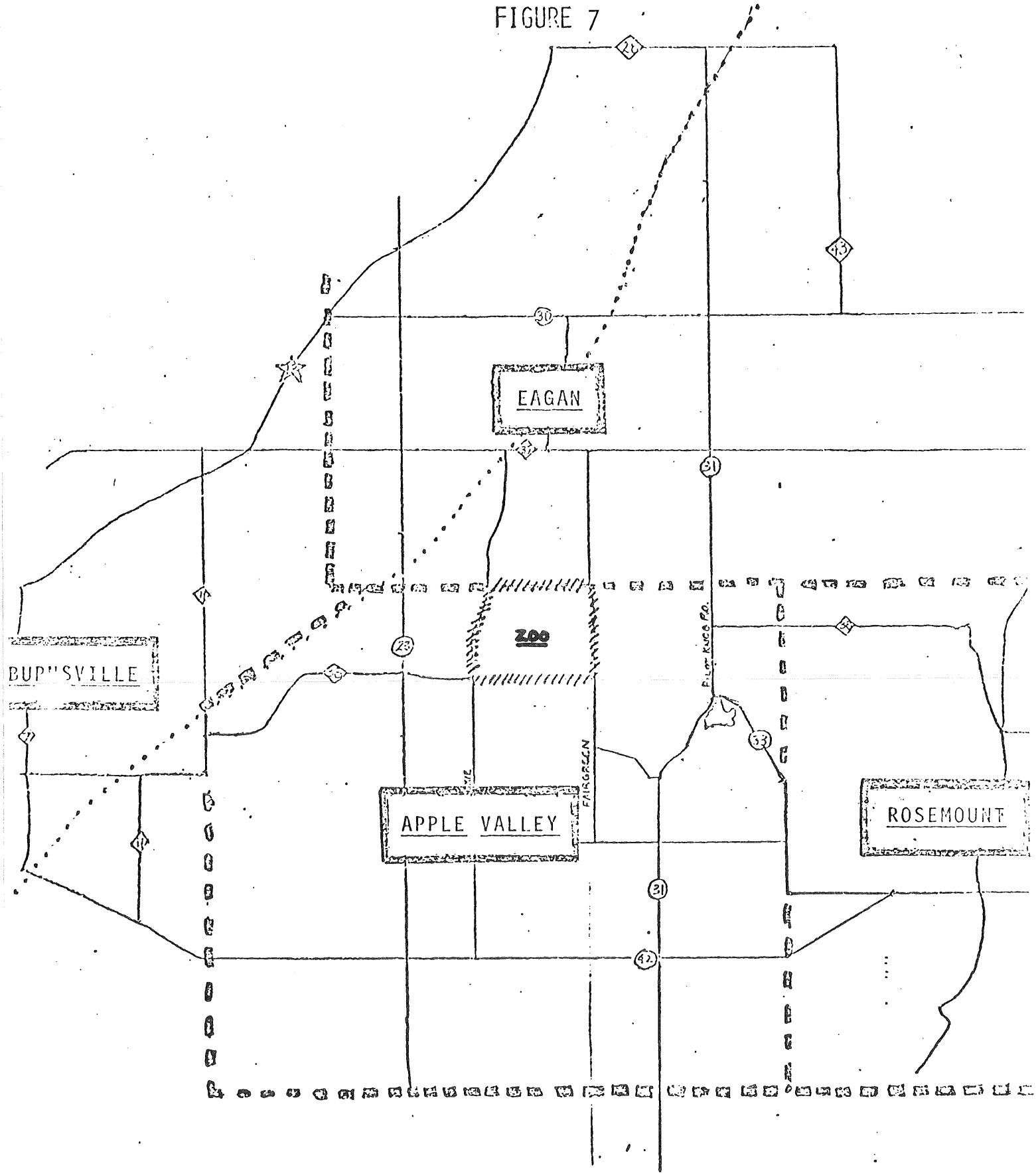
SCALE
2000' 0 2000' 4000'

ROUTE ALTERNATES MAP

PROJECT LOCATION MAP

FIGURE 6

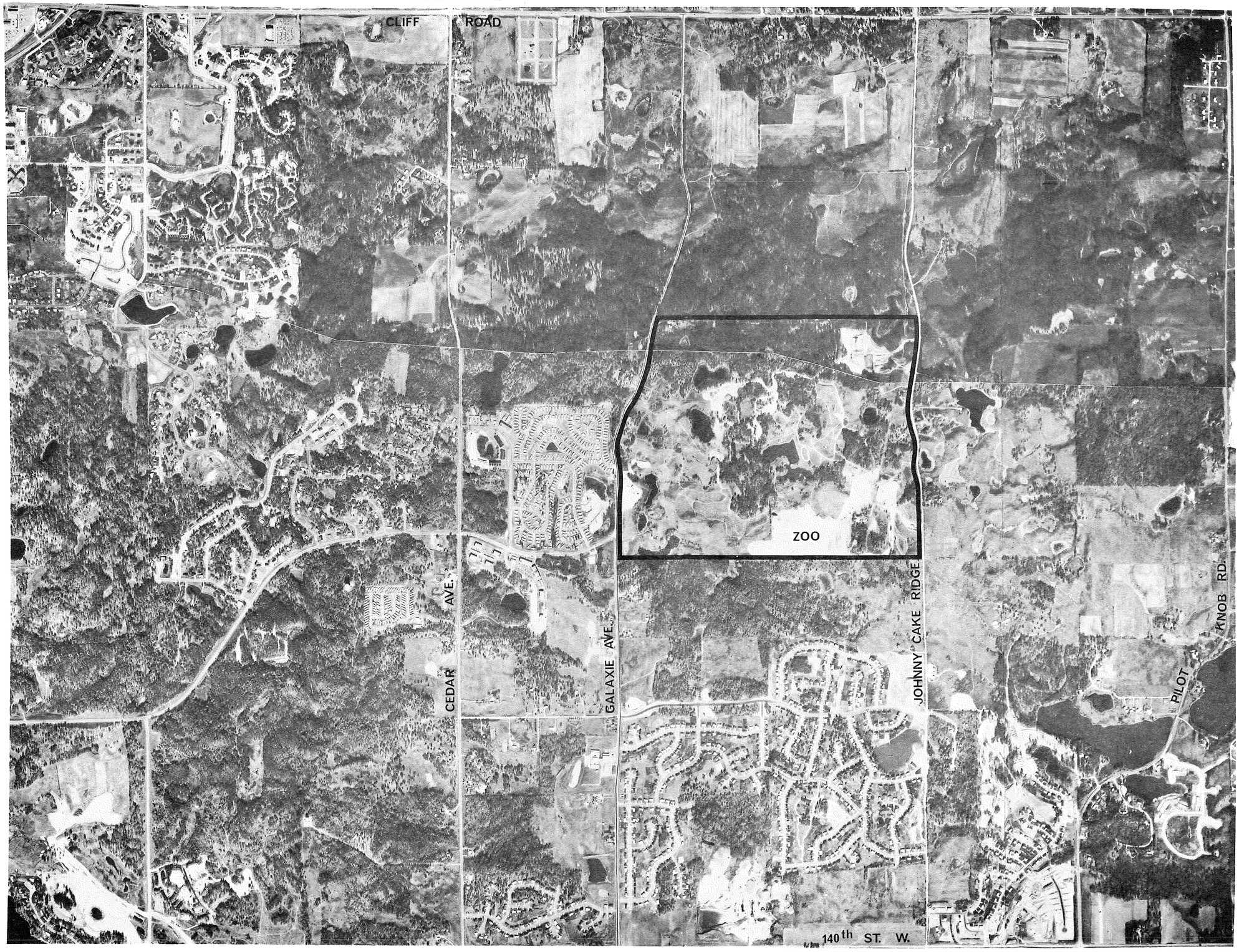
FIGURE 7



PROPOSED 35E

SCALE: 1" = 1 mile

FIGURE 8


CLIFF
ROAD
ZOO
CEDAR AVE.
GALAXIE AVE.
JOHNNY CAKE RIDGE
140th ST. W.
PILOT KNOB RD.

education and recreation. The large site would have to be carefully selected and environmentally compatible with the surrounding area. It would require state funding assistance.

Based upon recommendations of the Metropolitan Council, legislative action was sought to fund and establish such a facility through state tax revenues. The 1969 Legislature accepted in principle the concept of a major zoological garden, with the stipulation that the facility should be designed and operated to serve all the people of Minnesota and be located in the seven-county metropolitan Twin Cities area. It would become, in fact, the first "state zoo" in the United States. $500,000 was appropriated from Minnesota Resources Commission funds for the development of a master plan, to be considered by the Legislature in 1971 for full funding.

An eleven member, Governor-appointed Minnesota Zoological Board was created in 1969 (Minnesota Statutes, Section 85A), with authority to study, plan and acquire the Minnesota Zoological Garden "at a site to be selected by the Board but which must be located within the area comprised of the counties of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington". Prior to site selection the Board was required to prepare a "comprehensive plan for site location and development" and submit it to the Metropolitan Council for approval. The Board was to work with and assist other zoos in the state. No funding was provided for site acquisition at that time.

Pursuant to the legislative authorization and within the policy guidelines provided by the Metropolitan Development Guide for the proposed zoo, the Zoo Board began an extensive search for an appropriate site. After reviewing a substantial number of sites, the Apple Valley site was compared closely with three other primary sites (See Appendix 1). The Apple Valley site was recommended to the Metropolitan Council based not only on size, terrain, and road access; but also the preference expressed by the U. S. Department of Agriculture officials who would be required to approve the zoo once it was constructed. The Metropolitan Council reviewed and approved the site on June 25, 1970.

During this time the Board prepared a master plan for zoo development and a legislative recommendation for capital funding. The Metropolitan Council reviewed, and subject to later review of specific issues, approved site development on February 11, 1971. The 1971 Legislature considered but did not approve the funding recommendation. A revised funding proposal was submitted to the 1973 Legislature based on a master plan revision providing some reduced development cost. The site proposal submitted by the Minnesota Zoological Board for Legislative Committee review was the Apple Valley site. The 1973 Legislature approved the bonding program for the development of the zoo with the legislatively stated requirement that the site be acquired by the metropolitan county involved at no cost to the state.

Dakota County has acquired and transferred to the state 456 acres of the site. Three life estates have been granted within the area acquired. Three developed

parcels within the defined zoo site comprising 22 acres were not acquired by Dakota County. The Board has been granted statutory authority to acquire property and has now purchased one of those developed properties in a negotiated sale and proposes to do the same with the other two as the owners decide to sell. Some minimal additional perimeter access around water bodies will also be required. The Board and Dakota County have agreed to an easement around the north ponding area to be transferred by Dakota County to the Zoo Board.

The Legislature provided bond authority as follows:

(a) $23,025,000 in general obligation bonds was authorized.

(b) $2,350,000 in additional general obligation bonds would be issued upon a matching basis, provided that:

(c) $2,350,000 from non-state sources would be secured by the State Zoological Board through grants, gifts and donations from such non-state sources.

At this time $25,375,000 in bonds have been sold representing the basic bonding authority plus state matching bonds. Almost $1,500,000 in gifts has been received.

The Zoo Board developed an intiial capital budget of $26,036,000 based upon the assumption that 50% of matching funds could be expected. The budget included $22,345,000 directly assigned to capital construction. (The budget was revised using additions from gifts and interest income on investments. It is now $28,855,763 with $24,540,763 attributed to capital construction contracts.) The Board set up a management system that is responsible for cost control and internal scheduling of the several elements of construction. Those elements are described as contract packages. Items 2 and 3 of the Appendices are the most recent budget figures. The master schedule from February 1974 (Appendix 4) (now undergoing some revision) outlines how those contract packages are to be scheduled. The anticipated zoo opening is May 1978. Construction, primarily site work and utilities, has begun on the initial contract packages.

At the request of the Zoo Board, joint land use planning for the area surrounding the zoo has been initiated early in the project by Apple Valley, Eagan and Rosemount. Since that time, the directive by the Environmental Quality Council that this statement include more details on surrounding land use has resulted in a major joint planning effort among the Zoo Board, Apple Valley, Eagan, the Metropolitan Council, and the Environmental Quality Council. The result is a detailed Zoo Area Development Guide approved by Apple Valley and Eagan.

The 1974 Minnesota Legislature approved a bill authorizing a "zoo road" to be built by the Minnesota Department of Transportation. The road is an extension of a previously planned upgrading of State Highway 36 (Cedar Avenue Freeway) from the intersection with 35E to the south and east, to the zoo entry at the southeast corner of the zoo site.

SECTION 2

the environmental setting

C. Project Description.

1. Policy, Design and Patronage Projections.

The Zoo Board began action on the project by creating a project management system and selecting a design team.

The policy framework for design included the 1971 and 1973 Master Plans and a statement of Objectives and Guidelines. The statement of Objectives and Guidelines was first adopted in February, 1970. It was reviewed and revised in 1972 and 1973 prior to design direction by final Zoo Board adoption August 10, 1973.

An analysis of societal trends was also used to direct the design approach. The design sequence, the societal trends, and the Objectives and Guidelines are shown in the Appendices, items numbered 5, 6, and 7 respectively.

Within that policy framework a Services Program was prepared to outline what kinds of zoo site activities were to be accommodated. It ranged from visitor use areas, exhibits and zoo operations to descriptions of utilities (solid and liquid wastes, water, electricity, energy and communications), and service circulation. From that and from prior master planning a full Facilities Program was developed. The program elements were used to guide design.

Design then progressed from refined master planning through schematic design approval on February 3, 1974. Following that came the process of detailed design (design development and contract documents) for individual contract packages.

During the master planning and schematic design process the Zoo Board secured detailed studies of patronage projections. A Financial Feasibility Study had been done by Stanford Research Institute in 1970. Real Estate Research Corporation prepared an analysis in 1974. Real Estate Research estimated peak day attendance at 30,000 and total annual attendance in the first year of operation (based on a July 1977 zoo opening) at 1,313,400 without a zoo ride, or 1,500,000 with a zoo ride. Appendices 9, 10, 11, 12 and 13 show Summary of Projected Attendance, Summary of Population Data and Projections, Average Number of Visits, First Year Design Level of Attendance, and Visitor Distribution, respectively.

A more updated attendance projection has been prepared by Midwest Research Institute. The results of two surveys conducted during May 1976 indicate zoo attendance for the first year (May 1978 through April 1979) to be 2,376,000 visitors. The 95% confidence interval for this estimate ranges from 1,828,000 to 2,920,000. A Projected Attendance Summary for the Days of the Year for the Minnesota Zoological Garden's First Year of Operation appears in Appendix 17.

The proposed zoo access road will be designed to carry anticipated traffic for the design year 2000 in accordance with Federal Highway Administration and MN/DOT policy. Design year traffic volumes for the year 2000, and opening year roadway traffic volumes have been developed and are discussed on page 60.

2. Development.

The zoo development can be divided into three major development areas within the site, plus the basic internal systems, special services, and the access roads external to the site. The major areas are: a) the Main Building and parking lot; b) the Northern Trek; and c) the Internal Services area.

a) Main Building - The Main Building and parking lot (designed to hold 2,500 cars) is the focal point for visitor entry/exit to the site (see Figure 9 following). The building will house administration and education facilities as well as some major exhibit areas. There is an Oriental tropics exhibit area of approximately one and one-half acres all enclosed and representing the Oriental zoogeographic region with both plants and animals. The Minnesota exhibit will display representative Minnesota animals. It will be a combination of indoor/outdoor exhibits to be viewed from enclosed areas and walkways. The aquarium will feature a Beluga Whale exhibit with underwater viewing, and some smaller aquaria featuring ocean life in tropical, temperate and polar climatic zones.

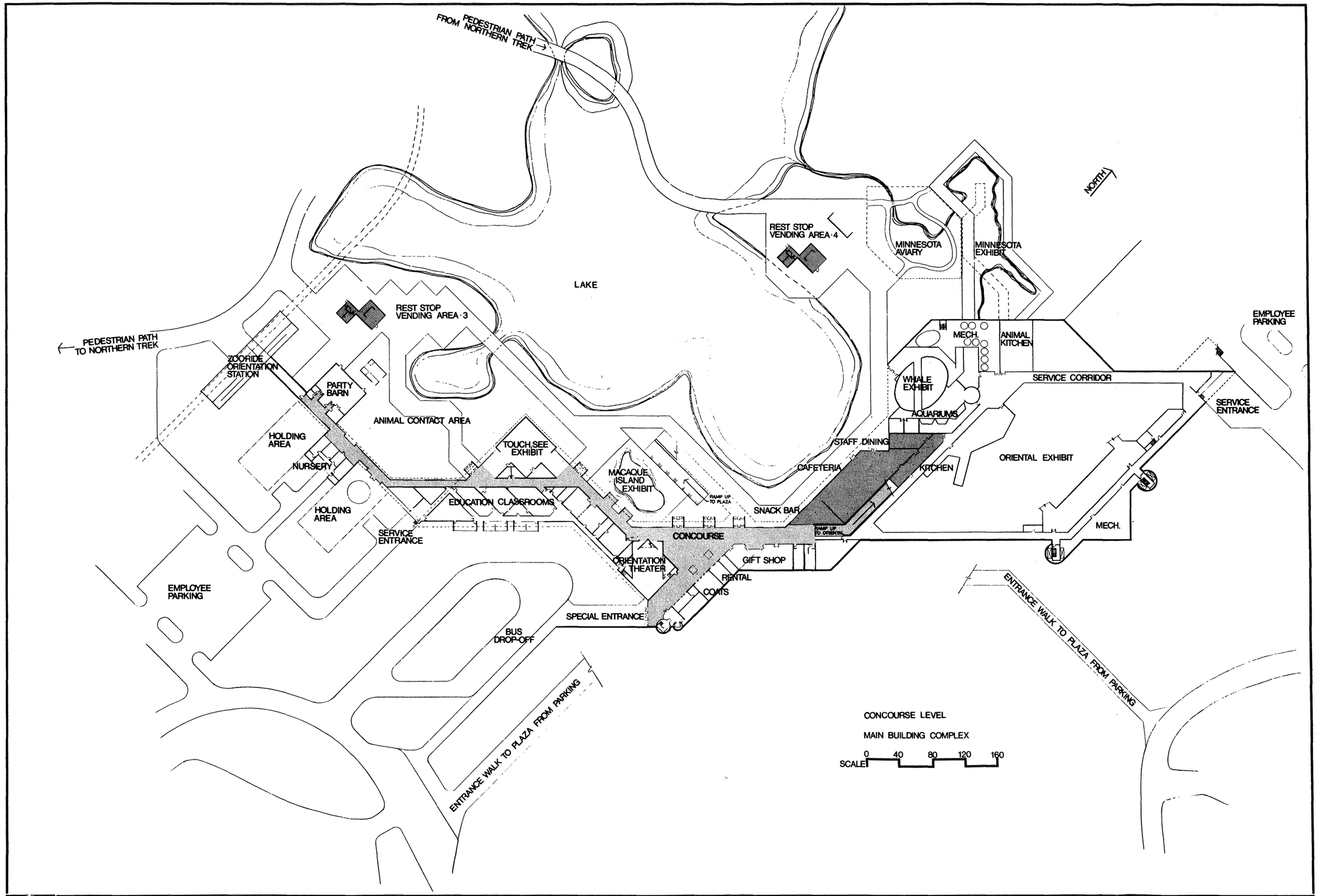
Near the building entrance there will be an outdoor exhibit featuring the Japanese Macaque (snow monkey). Also included are orientation theater, special interpretive areas, education facilities (with classrooms, laboratory and audio-visual), and a mini-zoo. The mini-zoo will include an animal nursery, an animal contact area and several small animal exhibits. Figure 9 illustrates some of the Main Building content and relationships.

This building and exhibits described are vital parts of an all-weather, year-round zoo concept. Future expansion is expected after several years. Climate controlled exhibit areas identified with other zoogeographic regions (such as Australian and Ethiopian) would be added north of the Main Building over a period of years.

b) Northern Trek - The largest developed portion of the site is referred to as the "Northern Trek". It is intended to give the impression that the visitor is traveling across the northern hemisphere of the world and viewing those northern hemisphere animals in habitats reasonably similar to that found in their native areas. This would include habitats resembling plains, mountains, tundras, forests, and marshland. Figure 10 illustrates the design concept of the Northern Trek.

The Trek has been arranged to make best use of existing open area and vegetation so that the natural attributes of the site can provide a habitat area substantially larger than the area expected to be developed for the animal exhibit.

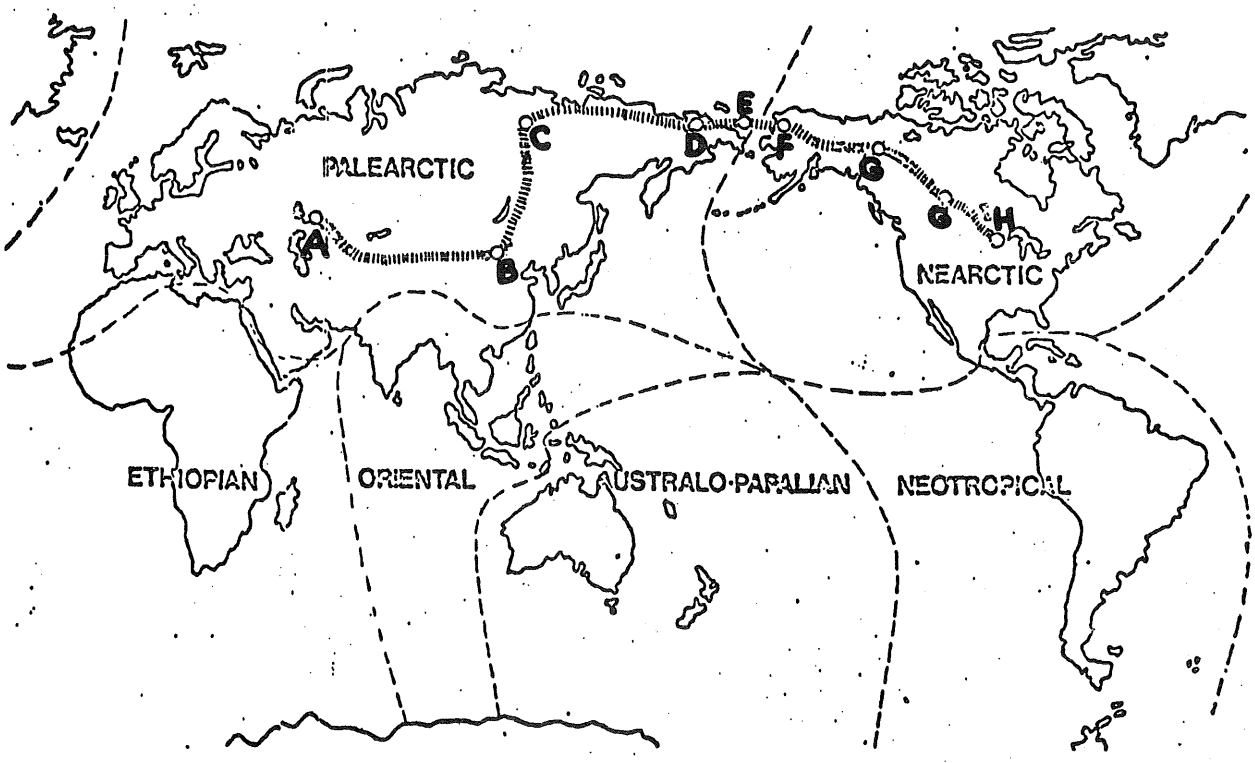
FIGURE 9



MINNESOTA ZOOLOGICAL GARDEN
DAKOTA COUNTY, MINNESOTA

CONSULTANTS	REVISIONS	Reference No.	TITLE	SHEET NO.	PACKAGE NO.
		Drawn By	MAIN BUILDING COMPLEX CONCOURSE LEVEL	2	
		Checked By			
		Scale			
		Date MAY 29, 1974			

FIGURE 10



ANIMALS AND HABITAT

A. Russian Steppe
   1. Saiga Antelope

B. Mongolian Steppe
   2. Przewalski's Horse

C. Montane Forest & Tiaga
   3. Siberian Tiger

D. Tundra
   4. Reindeer
   5. Wolf

E. Bering Straits
   6. Polar Bear
   7. Bearded Seal
   8. Arctic Fox

F. Tundra
   9. Musk Ox

G. Montane Forest
   10. Puma
   11. Grizzly Bear
   12. Rocky Mountain Goat
   13. Big Horn Sheep

H. Boreal Forest
   14. Moose
   15. Wood Bison

It will be necessary to construct roads, walkways, rest stops, animal barns and dens, as well as moats and other containment facilities for the exhibits. A high quality enclosed zoo ride for all weather viewing of the Northern Trek is being sought. Construction by a concessionaire is proposed. Figure 11 following shows three examples of proposed visitor/animal relationships (both pedestrian and zoo ride passenger) at exhibits. Future expansion of the Trek concept could be made to the north of the present Trek.

Existing water bodies will be retained largely in their present conditions, with the exception of some fill or drainage required to create a larger plains area, and dredging required to provide a pond deep enough for a swimming moose. There will be contained artificial water bodies for the polar bear and seal as well as artificial streams and waterfalls in other exhibits.

c) Internal Services - In the northeast corner of the site there will be development referred to as the "Internal Services". It will provide the basic operational support to the zoo. There are five separate structures serving different functions, but falling into two general categories: 1) operations and maintenance, offices and shops including commissary, greenhouse, general storage, carpentry, plumbing, fiberglass work and vehicle maintenance and storage; and 2) an animal care headquarters providing for animal holding, quarantine and medical treatment.

3. Basic Systems.

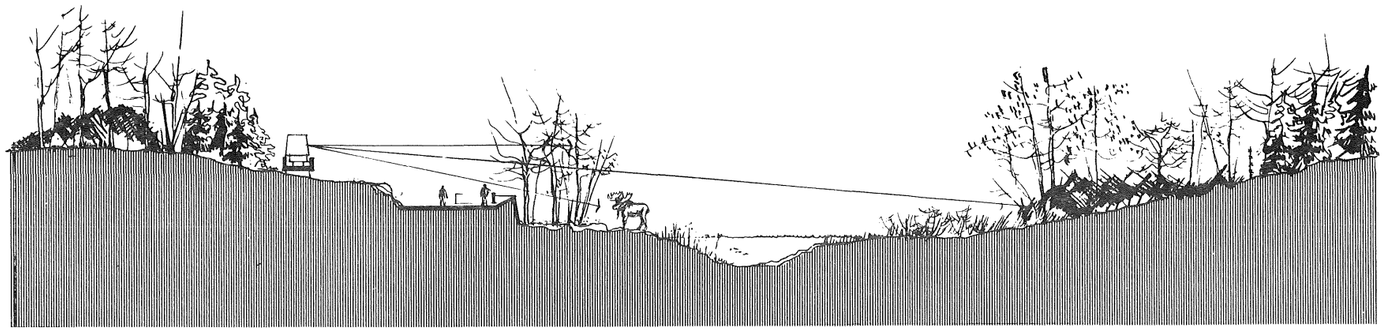
Actual construction will include not only general construction of structures, fences, exhibit areas, and landscaping, but also internal roadways and utility systems throughout the site.

The site will be completely fenced by a 10 foot high, vinyl clad or galvanized chain link fence with 15 foot clear space inside the fence. This is required to meet U. S. Department of Agriculture requirements.

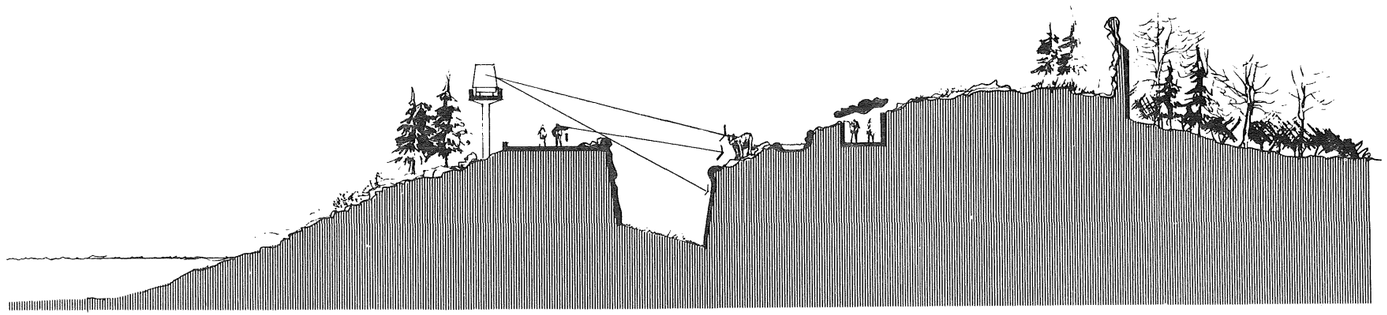
Water will be supplied by an internal water system including a 1,000 GPM pump plus a 600,000 gallon partially elevated storage tank and two 1,000 GPM pressure pumps. The deep well will draw from the Jordan Sandstone Strata. Treatment will include iron removal to avoid staining of structures and animals. Chlorine will not be added because it would threaten the life support water systems for the aquariums. Future or emergency connection to the Apple Valley water system is provided.

Electrical service is being provided by Dakota Electric by a new primary system installed through the site. The voltage of that line is approximately 13KV with expected initial zoo energy demand at approximately 5,000 KW. Emergency power is provided for some on-site facilities. At the same time as the electrical service is installed by direct burial, cables will be laid for Central Telephone. A major internal communications program on site will use zoo owned coaxial cables

FIGURE 11

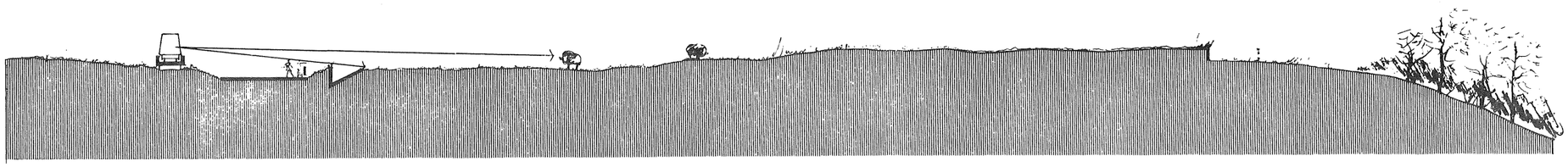


MOOSE EXHIBIT



SIBERIAN TIGER EXHIBIT

viewing tunnel



MUSK OX EXHIBIT

MINNESOTA ZOOLOGICAL GARDEN
DAKOTA COUNTY, MINNESOTA

CONSULTANTS

REVISIONS

Reference No.
Drawn By
Checked By
Scale
Date MAY 29,1974

TITLE
NORTHERN TREK
TYPICAL EXHIBIT
SECTIONS

SHEET NO. 5

PACKAGE NO.

and telephone type cables throughout the site for closed circuit TV, telemetry of animal conditions, monitoring of mechanical systems, and security.

Heat will be supplied to all major buildings by a central gas/oil heating plant. It is located in a separate area which will permit building and boiler additions to convert to coal if necessary some time in the future. Based upon a study of possible energy alternatives it was determined that a single heating plant with space to convert was the best alternative. Oil storage is provided. Space is allocated for future underground storage of coal. Minnesota Gas will provide gas capacity up to 25 million BTUs per hour. The widely dispersed facilities of the Northern Trek will have all energy needs, including heating, provided by electricity. (The Energy Report is included in the Reference List.)

Energy conservation techniques have been explored. Design objectives include the use where possible of heat recovery ventilation, a general "U" factor of .1, partial burying of structures, selection of animals tolerant of a broader range of temperatures for outdoor exhibits, minimal heating of separate animal structures, and where temperature control is required for animal health, establishing the broadest temperature ranges possible. Energy production techniques such as heat pumps, use of waste products, and solar energy have been considered. The design of the central heating plant will permit future development of waste product and/or solar energy approaches as well as coal conversion.

Limited energy will be provided by an Integrated Solar Space Heating and Cooling Demonstration Project funded by the Energy Research and Development Administration in Washington, D.C. The installation will contain 11,466 feet of flat plate collectors and 14,000 gallons of water storage. It will provide heating energy to two distinct areas of the zoo. During the winter heating season the system provides space heating and tempers incoming ventilation air for the Zoo Ride Transit Station and Ride Rest Stop out on the Northern Trek, and four buildings that form the Childrens Zoo. During the non-space heating months, the solar system will temper incoming hot water for the Main Building Complex. This includes the Oriental Exhibit, Minnesota Exhibit, Aquatic Exhibit, Macaque Exhibit, administration offices, educational facilities, food service and gift shop. The solar plant will have interpretive graphics and serve as an educational display besides providing energy.

Liquid wastes will be handled by direct sewer connections through the City of Eagan into the Metropolitan Sewage Disposal System. Capacity in the Eagan line will be up to 3 million gallons per day with peak use during initial years expected to be approximately 1 million gallons per day. Such wastes would include runoff within the self-contained exhibit areas to the extent that such runoff did not naturally percolate or evaporate. Solid wastes, including public waste such as paper, will be composted on the site. Natural runoff from non-exhibit areas will be contained in ponding areas on the site. Under USDA provisions drainage off the site will not be permitted. This self-contained drainage will require enclosure of all ponding areas at site perimeters.

Animal carcasses will be buried on site until an incinerator can be installed. An approved pathological incinerator is expected to be located in the Internal Services area adjacent to the animal health building. No post entry quarantine animal carcasses will be removed from the site. Examinations required will be provided on site in the animal health building. A special cooler is available for short term holding of carcasses. Only for specialized examinations not involving post quarantine animals might carcasses be removed. Proper destruction will be provided.

4. Special Services.

Concession operation of internal fast food services has been negotiated with International Dairy Queen. Also, a similar approach is being pursued to secure a zoo ride. Such self-financed operations would be tied by contract to zoo operations and would operate only within the zoo facilities. A long term lease with a private, profit-making firm would make the facilities for the service taxable as real estate. Real estate taxes will be paid to local agencies with tax monies being distributed according to local tax distribution legislation. There will be zoo operated gift shops and other visitor services such as stroller rentals, wheel chair rentals, storage lockers and first aid.

The zoo is planning a youth residence center related to educational programs. This facility would provide overnight lodging and special programs to school groups. It would charge a fee to cover basic costs.

Other self-supporting service facilities including a major dinner restaurant, service station, motel, and campground have been considered in the past. Under current design restrictions, the service station and campground are no longer considered compatible with zoo design. The dinner restaurant and motel are expected to be provided by private development in the area.

5. Zoo Educational Program as it Relates to Other External Groups.

All educational services, materials and programs will be designed to enhance appreciation and understanding of the zoo's exhibits as well as wildlife in general, natural history and zoological principles, especially the interrelationships of life forms. Structured learning tours to various sections of the zoo will be provided to school groups with reservations. These school groups will be given free admittance. Educational materials for off-site classroom use will be provided to teachers. The Interpretive Services and Education Department of the zoo will provide internship programs in conjunction with state institutions of higher education. The zoo will aid and work with special youth group activities such as Teenage Naturalists, Scout Packs, Vocational School Zoo Youth Groups, Junior Curators, etc.

The zoo Education Department is cooperatively working with and soliciting input for on-site and off-site educational materials and programs. Contacts have been

established with agencies such as the Department of Natural Resources, Minnesota Environmental Science Foundation, museums, nature centers, Region XI Educational Cooperative Service Unit, school district curriculum centers, University of Minnesota, etc. The zoo educational programs will compliment rather than supplement an existing program. All programs will be emphasizing the unique educational aspects of the zoo.

D. Access Roads.

1. Description.

The provision of external access roads to the zoo site have been considered. The major road is an extension of Minnesota Trunk Highway 36 (Statutory Route No. 279) hereinafter referred to as the zoo road, from the intersection with Interstate 35E (northwest of the site), south and east around the site to the southeast corner entry for the zoo site. It will be a limited access, four-lane divided highway designed to relate to topography and development. In addition, upgraded municipal (Johnny Cake Ridge Road) and county roads (such as County Road 32) will be part of the full permanent access road system. The local road system is discussed in Section 2, pages 38 through 40.

Traffic estimates indicate a maximum vehicle parking demand of 5,000 cars. A Real Estate Research Corporation study (Appendix 13) indicates that on peak days of 30,000 attendance with minimal transit use the total number of cars would be 8,000 to 9,000. Assuming a turnover rate as outlined by Real Estate Research for visitor attendance, no more than 60% of such vehicles should be at the site at any one time. Overflow parking (such as use of transit park/ride lots) will be arranged for the peak days.

Effective transit can reduce the amount of vehicle movement. The Zoo Board is participating in transit planning for the Dakota/Washington County area including the zoo site (see Appendix 14). The initial draft of that route ridership study indicates express service to the zoo and some possible regular transit services.

Traffic studies for the zoo were made by Barton-Aschman Associates, Inc. and Real Estate Research Corporation. These studies gave the following data for 1977, a year prior to the zoo opening.

Peak Day Attendance	30,000 people
Peak Day Traffic	8,000-9,000 vehicles
Peak Hour Traffic	2,500 vehicles in one direction

It is estimated that approximately 60% of the zoo attendance will originate in the Twin City seven-county area. These traffic studies also estimated that 90% of all zoo traffic will approach the site via I-35W and I-35E and Trunk Highway 36 when they are completed.

A detailed traffic study has been prepared by the MN/DOT. Final geometric design for the proposed zoo access road will be dependent upon this traffic study and later analysis during the design stage of this project.

The existing access problem between the zoo and major transportation routes has been studied since the site selection in 1970 by representatives of Apple Valley, Eagan, Dakota County, Metropolitan Council, Minnesota Department of Transportation, and the Minnesota Zoological Board. It was determined that an extension of the planned Cedar Avenue Freeway (Trunk Highway 36) from I-35E to the zoo entry near the southeastern corner of the zoo site would provide the zoo with adequate access. To be consistent with roadway and land use plans prepared for the area and also provide a reasonably direct access route to the zoo, the route was proposed to be located north-south along existing Cedar Avenue and east-west along the proposed County Road 38 corridor. This route is shown as Alternate A in Figure 6.

In order to determine that the selected route location was indeed the best choice, the Minnesota Department of Transportation in 1974 began looking at other possible route alternatives. Alternates B and C (Figure 6) were selected as the only possible alternatives to the previously proposed route and the do-nothing alternate.

The requirements to plan, design, acquire right of way, and construct the Selected Alternate A indicate that the road will not be completed until 1980 or 1981. Since the zoo is scheduled to open in Spring of 1978, there would be a period when the zoo would be in operation with inadequate access to the site. This would have serious effects on the early economic stability of the zoo. It would also cause zoo traffic to use existing residental streets. This will be disrupting to local trip movements and could create safety problems. Maintenance of these streets would also become a problem.

Below is an outline of the current development schedule for the zoo access road. Dates indicate when an activity is expected to begin or end baring unexpected circumstances.

Layout Development Finished	July 1977
Design Public Hearing	August-September 1977
Detail Design Phase Begins (Preparation of Construction Plans)	January 1978
Right of Way Appraisals, Acquisition Relocation Process Begins	June 1978
Construction Begins	May 1980 *March 1979

*Construction of the east-west section of zoo road from Galaxie Avenue to Johnny Cake Ridge Road may proceed at an earlier date because of dedicated right of way commitments.

Based upon the need for interim access (and the relationship to final access systems), interim access possibilities have been looked at by MN/DOT, Apple Valley, Eagan and the Zoo Board. After studying the existing road system and proposed roadway development plans for the area a proposal to complete and upgrade four miles of Johnny Cake Ridge Road south of Cliff Road (County Road 32) was adopted. This road was a two lane gravel road with 66 feet of right-of-way. Upgrading is currently under way to pave the northern two miles as a four lane urban design roadway with curb and gutter, and to maintain the southern two miles as a two-lane bituminous rural design roadway with gravel shoulders. This two mile portion would be upgraded to four lanes in the future.

The municipal roadway access would be related primarily to Cliff Road (County Road 32). Dakota County now plans a four-lane upgrading of a portion of that road. Further discussion of interim access routes can be found in Section 3, pages 64 through 66.

Early completion of the east-west section of zoo road along proposed County Road 38 from Galaxie Avenue to Johnny Cake Ridge Road would reduce congestion at the zoo entry on Johnny Cake Ridge Road by permitting traffic to use the two southern entries. The road would also service the residential and commercial properties proposed just south of the zoo site.

The municipal roadway access would be related primarily to Cliff Road (County Road 32). Dakota County now plans a four-lane upgrading of a portion of that road, but present plans terminate that four-lane capacity one mile west of the intersection with Johnny Cake Ridge Road. Coordinated road upgrading is being discussed with county representatives.

2. Route Alternates.

Following is a description of the three location alternates and also the do-nothing alternate that is being studied. They are labeled A, B and C in Figure 6. The alternates were selected for consideration based upon existing and proposed transportation corridors and land use. Each alternate route is between two and three miles in length and is a four-lane, limited access roadway. The comments, both from the Draft Environmental Impact Statement and Public Hearing indicate a strong preference for Alternate A which is now the selected alternate.

a) Alternate A - The selected alternate is approximately 2.8 miles long and constructed on existing Cedar Avenue and proposed County Road 38 alignments. This is the location generally described in the legislative bill authorizing this road, and is the location planned for by the agencies that have been involved in comprehensive planning for the area: Apple Valley, Eagan, Dakota County, Metropolitan Council, MN/DOT, and the Minnesota Zoological Board.

Based upon traffic projections and systems planning, this alternate is proposed to be a four-lane freeway[1] on the Cedar Avenue alignment (north-south section). Proposed County Road 38 between Cedar Avenue and Johnny Cake Ridge Road is proposed as a four-lane expressway.[2]

An interchange is proposed at the junction of these two roads.

The north-south section of the zoo road is proposed to be basically depressed. Access to adjacent areas will be provided. One Hundred Twenty-Seventh Street West is to be bridged over the freeway and a partial interchange may occur at this location. A frontage road on the west side is proposed from one-eighth mile north of Cimarron Road to proposed County Road 38.

The east-west section of the zoo road on the proposed County Road 38 alignment will be in both cut and fill areas. No grade separations are proposed and at-grade access will be limited to approximately five locations along this section: Galaxie Avenue, possibly Foliage Avenue extended, both zoo entrances, and Johnny Cake Ridge Road. These intersections will provide access to existing development and proposed developments in conformance with local plans for the area. Frontage road may not be required along this section.

Right-of-way along Cedar Avenue varies from 66 feet to 170 feet. About 150 feet of right-of-way plus temporary slope easements[3] will be required to construct the freeway section between interchanges. The right-of-way required for the frontage roads will be in addition to this 150 feet.

Right-of-way needs along the proposed County Road 38 alignment will be approximately 150-250 feet. Due to the hilly terrain and the grading necessary to provide the required side slopes, temporary slope easements will be required during construction.

The selected Alternate A would:

1) Displace six to eight residences.
2) Require relocation of and possibly additions of sanitary sewers.
3) Remove existing at-grade crossings along Cedar Avenue, displacing access to the existing and proposed developments adjacent to Cedar Avenue.
4) Remove approximately 50 acres of Oak trees.

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[1]Freeway - An expressway with full control of access.

[2]Expressway - A divided arterial highway for through traffic with full or partial control of access and generally with grade separations at intersections.

[3]A temporary slope easement is an agreement with the property owner to allow the highway contractor temporary access to the land adjacent to the roadway in cut or fill areas. The purpose of this is to grade and stabilize slopes that will fit into the adjacent terrain.

b) Alternate B - This alternate runs southeasterly from the proposed Cedar Avenue/I-35E interchange to Galaxie Avenue. It follows Galaxie Avenue southerly and then turns easterly in the proposed County Road 38 corridor south of the zoo site to Johnny Cake Ridge Road this route length is approximately 2.3 miles.

This alternate would require a relatively large and complex interchange connection of Cedar Avenue, I-35E, and the zoo access road. This interchange would basically have five legs: Cedar Avenue Freeway (Trunk Highway 36) - north; Cedar Avenue (CSAH 23) - south; I-35E - southwest; I-35E - northeast; and zoo access road - southeast. A workable preliminary design of this interchange has not yet been made; however it is apparent that it would require a significant increase in both land acquisition and construction costs in comparison to a standard cloverleaf-type interchange (as proposed in Alternate A).

This alternate would be a four-lane expressway design with limited access and at-grade intersections except for the complex interchange with Cedar Avenue and I-35E.

Two Section 4(f)[4] parcels are located adjacent to this alternate. They are the zoo site itself and city park land located in the southwest quadrant of the 127th Street West/Galaxie Avenue intersection. Because this alternate cannot be constructed within the existing 66 foot right-of-way on Galaxie Avenue, some of the required right-of-way would have to come from these 4(f) lands.

It is likely that right-of-way needs in the area of the northeastern corner of the Cedar Knoles Mobile Home Park would require land acquisition and relocation of approximately five to ten mobile homes. Depending on route location, two to three additional homes along Galaxie Avenue south of the zoo may also require acquisition.

The reasons for dismissing Alternate B are as follows:

1) Zoo traffic would conflict with local traffic on Galaxie Avenue.
2) The new roadway would serve only the zoo site, and would be in conflict with local proposed roadway development.
3) Section 4(f) lands would be required.
4) A large stand of mature oak trees would be impacted.

c) Alternate C - This alternate runs easterly on a new alignment generally along the Eagan/Apple Valley corporate limits line from the proposed Cedar

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[4]Section 4(f) lands are described in the Department of Transportation Act of 1966. Section 4(f) land may be any of the following: park and recreational lands, wildlife and waterfowl refuges, and historic and cultural sites. Use of this land as prescribed by the Act requires that a Section 4(f) statement be prepared when such lands are infringed upon documenting a determination that there are no feasible and prudent alternatves to the use of Section 4(f) lands.

Avenue/I-35E interchange to Johnny Cake Ridge Road. It then follows Johnny Cake Ridge Road southerly to the proposed County Road 38 corridor. There it turns westerly on the proposed County Road 38 alignment to serve the two southern zoo entrances.

As with Alternate B, this alternate would also require the same type of complex interchange with Cedar Avenue/I-35E.

This alternate would be a four-lane expressway with limited access controls and at-grade intersections.

Assuming that Johnny Cake Ridge Road will be upgraded under separate contracts, this alternate requires the shortest actual construction, approximately 2 miles, even though the total alternate length is the longest, approximately 3 miles.

This alternate would require right-of-way acquisition from Section 4(f) lands. Besides the zoo itself, these lands are north, northeast, and east of the zoo site.

No homes have been identified that would have to be acquired to construct this alternate.

This alternate requires all zoo traffic to use at least part of Johnny Cake Ridge Road east of the zoo. This path is circuitous for most of the traffic. Also, significant delays could be expected during peak traffic periods because all traffic would be funneled to Johnny Cake Ridge Road.

The reasons for dismissing Alternate C are as follows:

1) Zoo traffic would conflict with local traffic on Johnny Cake Ridge Road.
2) The new roadway would be in conflict with local proposed roadway development.
3) Section 4(f) lands would be required.
4) A large stand of mature oak trees would be impacted.
5) The impact on steep slopes would be greatest with this alternate.

d) Do-Nothing Alternate - The do-nothing alternate means that none of the proposed alternates would be constructed. Therefore, the only roadway construction in the area would be other proposed improvements. These include:

1) Construction of Cedar Avenue Freeway north of I/35E.
2) Construction of Interstate 35E.
3) Upgrading of Johnny Cake Ridge Road.
4) Widening of Cliff Road (County Road 32).

It is assumed that smaller safety improvement projects such as turn lanes, channelization, traffic signals, etc. would also be constructed as warranted.

The do-nothing alternate would not require the relocation of any homes or businesses. Also, no Section 4(f) involvement would be expected. Water quality is not expected to be significantly affected.

With this alternate, all zoo traffic will have to use county and municipal roads near the zoo site. Maintenance of these roads will require more man hours and materials.

Zoo traffic would be expected to use local residential streets to gain access to the site. This could cause significant disruption in some neighborhoods.

With the influx of the zoo traffic in local neighborhoods, significant delays with stop-start conditions are expected. An adverse effect on noise and air quality may also occur.

From a geometric and capacity point of view, it does not appear that the do-nothing alternate will allow safe and efficient movement of traffic to the zoo site.

The reasons for dismissing the Do-Nothing Alternate are as follows:

1) It would be in conflict with the legislative mandate to construct a zoo access road.
2) It would not provide adequate access to the zoo site.
3) It would not provide safe and efficient movement to the zoo site.
4) Not constructing an access road would seriously overload the existing local roadways.

E. Zoo Project Alternatives.

1. General Description of Alternatives.

The following is a description of potential alternatives to the Minnesota Zoological Garden as located and designed.

The major alternatives have been gradually reduced over a period of years. Initial community interest was directed toward improvement of the existing zoo at Como Park in St. Paul. Several studies culminated in a Metropolitan Council Development Guide setting out policies for a large acreage "new zoo" concept. The space at Como Park was not sufficient and the existing caging approaches were not appropriate to the zoological garden concept. Legislative authorization for planning and construction of the new zoological garden required large site alternatives to be explored within the seven-county metropolitan area, and did not suggest use of Como Zoo. The result is that Como Zoo will continue to operate as a separate local facility, and the Minnesota Zoological Garden will be a totally separate but cooperating facility.

The site exploration included well over 100 suggested sites, but was readily reduced to a few sites with good potential. The final evaluation involved detailed study of four potential sites. Those four sites, located in three general areas of the metropolitan area, were described as

1) Lebanon Hills (located south of the central cities in Dakota County).
2) Anoka (located north and west of the central cities in Anoka County).
3) Jordan (located east of the central cities in Ramsey County).
4) Bailey (Located east of the central cities in Ramsey County).

The primary criteria used in evaluation included accessibility, cost and availability, surrounding environment, utilities, and site characteristic. A copy of the major portions of the Site Recommendations prepared by the consultants is attached to this statement as Appendix 7, and will not be reviewed in detail here.

Based upon the evaluation prepared and the recommendation of the Lebanon Hills site (Lebanon Township has become the City of Apple Valley and the site is now referred to as the Apple Valley site) the Zoo Board approved the Lebanon Hills site. This choice was reviewed and confirmed by action of the Metropolitan Council and the Minnesota Legislature. Dakota County proceeded with land acquisition based upon the approvals, and the Zoo Board has initiated construction.

Comprehensive planning by the Metropolitan Council, Dakota County, and Apple Valley all now confirm the Lebanon Hills zoo location. Apple Valley has designated the zoo use on an official map and has rezoned the property specifically for this use. Sewer plans and now sewer construction by Eagan confirm the Lebanon Hills zoo location. Joint land use planning by the communities will culminate in a Zoo Area Development Guide to be considered part of the local comprehensive plans.

The study of alternate locations has been thoroughly pursued in the past, and the Apple Valley location has been confirmed in a variety of ways by public agencies. The opportunity for public participation has been substantial.

Based upon the previous full consideration of alternate sites and substantial public confirmation of the Apple Valley site, this statement will not consider alternate sites as a project alternative.

The project alternatives would be the modification of design concept or the do-nothing alternative.

2. Modification of Design Concept.

Any modification would still require visitor service facilities, parking areas, animal care facilities, and exhibit areas. These are the project actions which alter the site characteristics. Modification alternatives (such as increased caging, separate main building structures, or more open mixture of animals)

would not be beneficial. Additional animal health and care hazards would be created and the whole concept of the zoo could be lost. Most important, the environmental effects would not be reduced.

3. Do-Nothing Alternative.

The only other alternative is to do nothing. This would mean retaining the land for other uses. Apple Valley is an urbanizing community in which the natural result would be the development of the land. Full development of the site would have a far greater impact on the environment than the alterations necessary for zoo construction.

Further, the construction of the project has proceeded (as a project in progress at the time the Environmental Impact requirements became final) pursuant to Environmental Quality Council authorization. Construction began with basic site work (rough grading) and utilities, and has progressed to some major structures. Given the status of site alterations and construction, the do-nothing alternative is really not viable at this time.

A. Natural Setting.

1. Area Involved.

The 480 acre site is in a rural/suburban community. That area will be described in more detail in following sections. Generally, the area is rapidly changing from rural to urban, and the land form is rolling and wooded.

The site itself is hilly, wooded, former agricultural land. It had been used primarily for grazing or hay production. The open land has been attractive to trail bikes and snowmobiles. This has created an existing noise problem and seriously disrupted the natural environment.

Within the designated site there are seven residences with some outbuildings on two of those properties. All residential properties are located near the roadways that border the zoo site. Initial acquisition by Dakota County was done entirely by negotiated sale. Four residential properties were acquired, three subject to life estates for the owners. The fourth has now been converted to a project office for use during zoo construction. The owner of another residential property has sold his property to the Minnesota Zoological Garden and moved. Two other properties will be sought by the Zoo Board when offered for sale by the owners. Fencing for the zoo site will place all existing residential uses outside the zoo boundaries.

The potential roadway areas have also been examined. The adjacent lands to the north, northeast, and east of the zoo have been designated as Metro Open Space. The land to the north and northeast have been purchased by Dakota County and the other parcel is in the process of being purchased for future park land. These lands are considered to be Section 4(f) lands as defined in the Department of Transportation Act of 1966. This land would be affected only by roadway Alternate C.

There is also a municipal park located near the southwestern corner of the zoo site. It is in the southwest quadrant of the intersection of Galaxie Avenue and 127th Street West, and is also considered to be Section 4(f) land. This park would only be affected by roadway Alternate B.

Residential developments scatter the area; however, most of the land is still undeveloped. Some homes are located along Cedar Avenue, Galaxie and Johnny Cake Ridge Road, and a few apartment buildings have been built adjacent to Cedar Avenue. A large mobile home park is located directly west of the zoo between Cedar Avenue and Galaxie Avenue. There is also a new housing development (Greenleaf Fifth Addition) a quarter mile south of the zoo.

Two developers own the bulk of property immediately south of the zoo site. One developer is proposing a residential development and the other, along the proposed zoo road entrances, has a planned development agreement for commercial and institutional uses.

2. Historic Significance.

Archaeological resources of the undeveloped portion of the Minnesota Zoological Garden which will be developed in future expansion will be surveyed for historical sites and artifacts during the summer of 1977 under the supervision of the Archaeology Department of the Minnesota Historical Society.

Only preliminary field reviews have been made by the Historical Society in the vicinity of the proposed MN/DOT constructed access roads to the zoo. These reviews indicate that the area exhibits a reasonably high potneital for the existence of archaeological sites. Due to the closed wooded terrain in much of the survey area, a determination was made to delay field surveys of these corridors until 1977 when more time and personnel would be available for those surveys.

3. Topography.

A general topographic map (1" = 100') is available for the entire site. A reduced copy would not show clearly, and therefore is not attached to this report. A detailed topographic map covering the major developed portions of the site (approximately 310 acres) has been completed by Clark Engineering in 1974. It is hilly terrain with variations from 1,047 to 904 feet.

There are several small lakes or ponds reviewed in more detail in the following section on soil and water characteristics. None are over 10 acres in size. Zoo design will keep these water bodies in their natural condition.

4. Soil and Water Characteristics.

The geology of the area is characterized by the glacial movement of rock layers and the glacial deposit of gravel. Attached as Figure 12 is a cross-section illustrating the basic geological character of the area.

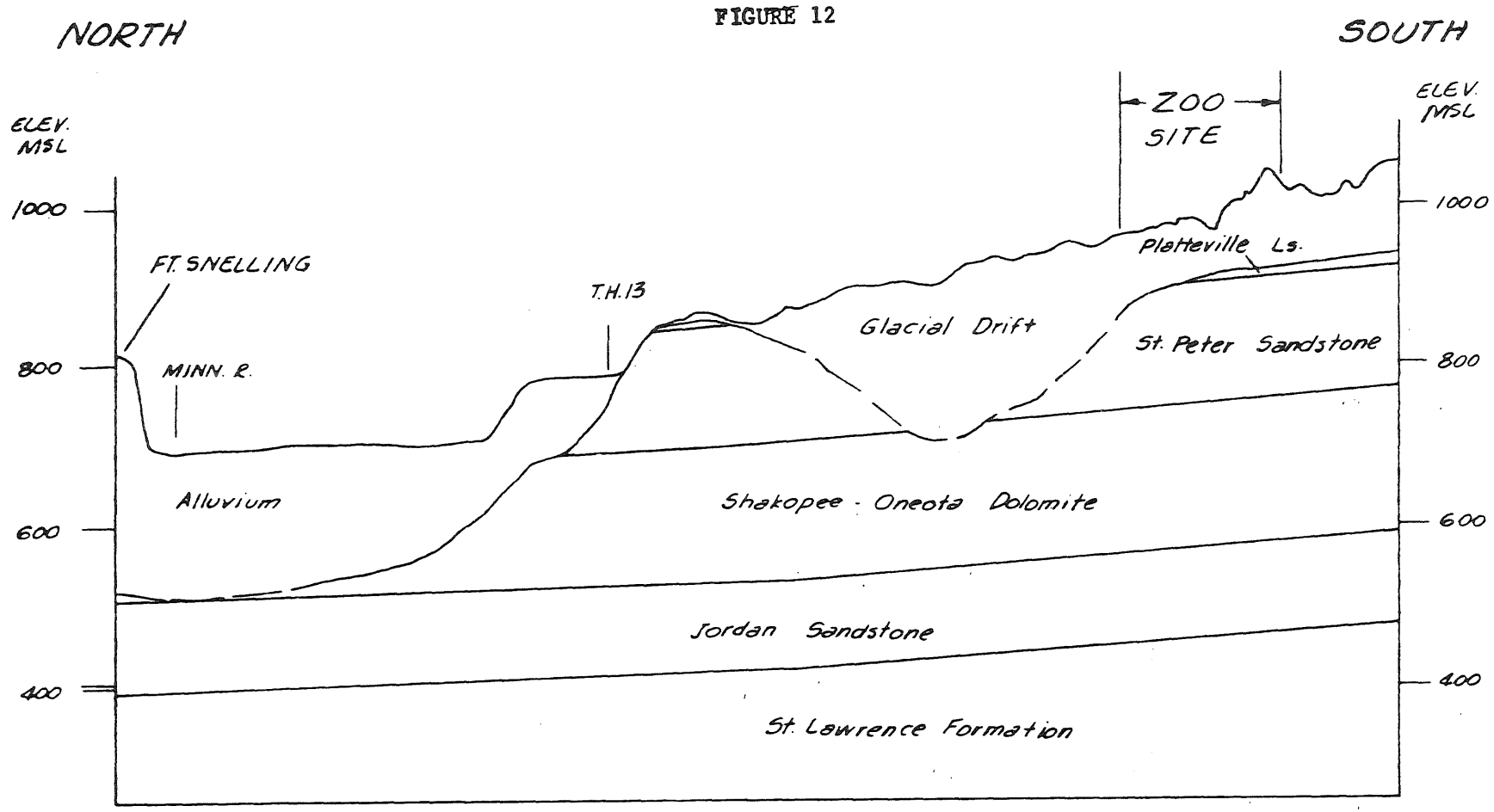
The surface soils can be broken down into two types:

a) Those in the low-lying areas which consist of highly organic black silty clays and peats.

b) A thin layer of sandy and silty loams which cap the rolling hills.

The soils are underlain by a red-brown, gravelly medium to coarse grained sand of glacial origin. The glacial materials are estimated to be approximately 100 feet thick. There exists a series of clay seals in the soil which retard or prevent the infiltration of surface runoff into the ground water.

FIGURE 12



HORIZONTAL SCALE

0 1 2 3 MILES

MINNESOTA ZOOLOGICAL GARDENS

GEOLOGIC CROSS-SECTION

SEPT. 1970 FIG 61

There is no stream or major drainage pattern carrying water off the site. Water tends to be held within the site in a series of lakes (ponds) and marshes, and lake levels are dependent upon precipitation and runoff. The lakes are underlain by generally thin organic sediments. The following table (coded to a soil test map and report by Hickok and Associates in October 1970) reviews infiltration and percolation:

Results of Infiltration and Percolation Tests

Test Site	Lake Bottom Infiltration Test - Theoretical Infiltration Coefficient @ 4' Head gpm/acre	Shoreline Percolation Test - Theoretical Percolation Coefficient gpm/acre
Lake C 1-1	90	8
Lake A 1-2	400	4
Lake D 1-3	130	20
Lake B 1-4	700	8
Swamp 1-5	130	8
Lake I 1-6	650	8
Lake H 1-7	350	25
Swamp 1-8	260	16
Lake E 1-9	---	8
Lake F 1-10	40	8
Lake G 1-11	170	8

Surface water consists primarily of nine lakes (more accurately described as ponds since none are over 10 acres in size). The surface water resource (again coded to the Hickok report) can be summarized as follows:

Lake	Watershed Size (acres)	Lake Size (acres)	Depth (ft)
A	56.0	8.2	2.0
B	8.0	1.7	.9
C	10.0	2.0	3.0
D	39.0	5.0	1.5
E	16.0	5.2	4.0
F	23.0	3.5	1.0
G	11.0	2.8	1.5
H	14.0	3.9	6.0
I	21.0	3.8	3.0

It is understood that all lakes except H probably freeze out in the winter. The Hickok report contains further information about sedimentation and related issues. Surface water quality is good for shallow ponding areas sustained by natural drainage.

Ground water is available. It is of excellent quality with some strong iron content likely. Deep water wells in the area have penetrated more than 100 feet of the glacial material. In the area selected for the zoo well the ground level will be 1,046 feet and the water will be drawn from the Jordan Sandstone layer at approximately 550 feet. Current USGS studies indicate water supply at that level is more than adequate for the zoo and surrounding communities.

5. Vegetation.

The area is primarily deciduous forest with some cleared grass areas. Marshland vegetation (marshgrass and cattails) stand in the marsh areas and surround some of the water bodies. Most of the heavy wooded area is on the north portion of the site as indicated by the Master Site Plan (Figure 1) and perspective drawings (Figures 2 and 3).

The wooded areas are primarily oak (red, white and burr) with a good amount of aspen. There are also some elm, ash, silver maple, box elder, willow, birch, sumac and chokecherry. Understory plants commonly found within oak stands include raspberries or blackberries, prickly gooseberry, sage brush, cherry and dogwood. In the lower lying areas willow and alder are found at the edges of the wetlands, while sumac is occasionally present near the perimeter of the oak stands.

6. Wildlife.

Wildlife on the zoo site is restricted to those animals which can occupy an urbanized deciduous broken forest with small amounts of open meadowland and a number of shallow ponds or small lakes distributed throughout the site.

There are no real travel corridors from the site such as streams, valleys or continuous sections of closed woods. There are no known rare species, or special restricted habitats occurring on the site. Rather, the site does offer appropriate habitat for many generally distributed native animal species.

Fishes: Fish species are restricted to the few small, generally distributed forms which can exist in lakes that essentially freeze out during the winter.

Reptiles and Amphibians: Of approximately 44 species occurring in Minnesota, 29 are suspected to occur on the site based on documented records. This would include 11 species of amphibians, 3 species of lizards and skinks, 11 species of snakes, and 4 species of turtles.

Birds: Of the 371 species of birds reported from Minnesota, local naturalists have identified on or near the site some 200 species of birds. These include resident species, migratory species, and occasional or rare species sighted in the area during their normal migration route or blown off course by storms.

Mammals: Of the approximately 77 mammal species occurring in Minnesota, it is estimated that 32 species do occur on the zoo site with possibly 10 others being present.

Until its occupation by the Zoological Garden, the site has been used as a local hunting area by Dakota County residents. In recent years, it has also

been exposed to increasingly intense activity by all-terrain vehicles, primarily snowmobiles and trail bikes. The lakes on the site are too shallow to support populations of fish desirable to the fishermen.

It will be an objective of the zoo to preserve small native Minnesota wildlife which occurs naturally on the site, except those which would function as a predator or potential disease transmitter to the Zoological Garden animal population. All trapping and removal of native wildlife will be coordinated through the Minnesota Department of Natural Resources.

7. Atmospheric Conditions.

Climatic conditions for the site can be determined from statistics for the larger regional area. Normal annual percipitation for the metropolitan area is 25.94 inches according to the U.S. Weather Bureau. The monthly mean temperatures are as follows:

Month	1976	Normal
January	11.6	12.4
February	27.8	15.7
March	31.4	27.4
April	51.8	44.3
May	58.9	57.3
June	71.7	66.8
July	76.1	72.3
August	73.3	70.0
September	61.8	60.4
October	44.6	48.9
November	28.3	31.2
December	13.6	18.1

Note: All temperatures given in degrees Fahrenheit.

There is a wide range of variation in temperature and angle of sun. There are prevailing winds primarily from the west. The site is within an area of occasional strong winds. Temperature, sun, winds, and snow have all been considered in design.

There is no known air pollution problem at this time, but with overall area development and increased vehicle traffic, conditions could change. The noise levels are within acceptable limits, except for the occasional motor bikes and snowmobiles on the site. Heavy construction activity in the area does occasionally cause dust and noise, particularly on unimproved local roads. This is temporary.

B. Surrounding Area.

1. Area Immediately Adjacent to Site.

In the area immediately adjacent to the site, a large mobile home park and some recent apartment developments are located west of the site across Galaxie Road (west boundary of the site). There is still some open land zoned residential/agriculture to the west of the site.

There is a strip of some one to five acre residential lots developed along Galaxie just south of the zoo site. Further east from Galaxie and just south of the zoo site a major housing development is proposed. This is a heavily wooded area. East of that is a parcel proposed for minimal zoo-related commercial (motel and service station). Through all of these parcels south of the site a major roadway has been planned for several years and right-of-way is being dedicated by the developer. The state zoo road is expected to generally follow that alignment.

On the east side of Johnny Cake Ridge Road (generally the eastern boundary of the site) there are some homes and a small air strip. Most of the area is open, but zoned residential/agriculture.

The area north of the site is in Eagan and almost all undeveloped and heavily wooded for about a quarter mile north of the site.

In order to preserve the natural beauty of the area as it develops, the communities are planning community parks and related trail systems. Dakota County has a major park immediately adjacent to Holland/Jensen Lakes. The Metropolitan Council has proposed that the park area be expanded to surround the zoo site on three sides (south, east and north). Dakota County has proposed park area on at least two sides (east and north) and has been granted metropolitan park funding by the Metropolitan Council for land acquisition.

In the area to the north of the zoo site there is a high ridge, known on Johnny Cake Ridge, reportedly used as a marshalling area for Civil War troops from Minnesota. It is included in the area proposed for county/metro park acquisition.

2. Demography.

The present population (1970 census) and population projections in millions for Minnesota and the seven-county metropolitan area are as follows:

	1970	Estimated 1985	Estimated 2000
Minnesota	3.805	4.52	5.25
Metro Area	1.874	2.399	3.00

The metropolitan area is growing at a more rapid rate than the state as a whole (1.7% metro versus 1.2% statewide, estimated up to 1985). Within the metro growth area, Dakota County is expected to be one of the fastest growing areas, and the cities of Apple Valley and Eagan are among the rapdily developing suburban communities. Apple Valley had a population of 8,500 in 1970 and is expected (Apple Valley projections) to have a population of 56,000 by the year 2000.

Dakota County is among the top five counties in the nation in per capita income. Apple Valley is a primarily middle class, residential community with some limited commercial development. At this stage in the growth of Apple Valley, the population tends to be young married with small children. Eagan is similar in character with somewhat more commercial/industrial development.

3. Existing Land Use.

The zoo peripheral area (a one to two mile radius) is almost exclusively developed with residential uses, metropolitan, county, or municipal parks and agricultural uses.

The zoning and land use character within a three to five mile radius around the zoo site was surveyed by Charles Wilson and reported in a report dated August, 1974. It included a one-mile survey of current agricultural uses. The report is attached as Appendix 15.

Both Apple Valley and Eagan have approved comprehensive community plans. Those plans indicate a strong emphasis on future residential development. Limited commercial development (motel, service station) have been proposed for an 80 acre area just south of the southwest corner (parking lot area) of the zoo site. It would relate to the zoo and zoo access road. A small commercial center is proposed approximately one-half mile south of the southeast corner of the zoo site.

A major development called Eagan "320" Limited Partnership had been proposed by Fortune Realty in the Eagan area at the north boundary of the zoo site. Its promotion relied largely on the anticipated patronage stimulation from the zoo. Eagan has rejected the proposal.

The zoo site itself is now zoned Institutional "P". It was previously zoned residential/agricultural but had been designated as zoo area by the official map of Apple Valley. Dakota County, with Metropolitan Council Park funding assistance, is completing park acquisition in Eagan along the north zoo site boundary and in Apple Valley along the east zoo boundary. Consideration was given for the 80 acre proposed commercial parcel south of the site to be made parkland. This area was never recommended by Dakota County to the Metropolitan Council. The City of Apple Valley has prepared a report based on

a survey of other zoos indicating they should expect relatively little impact by the zoo on communities, including relatively little need for commercial development (Appendix 16).

4. Present Transportation Routes.

A Transportation Plan Map is attached as Figure 13. Presently only three roads touch the border of the Minnesota Zoological Garden site. These include Galaxie Avenue, Johnny Cake Ridge Road and 127th Street West.

All roads in the project area are currently providing an adequate level of service. Only Cedar Avenue between County Road 32 and County Road 38, and CSAH 42 between Cedar Avenue and CSAH 31 are approaching conditions of unstable traffic.

Many of the streets and highways which will serve the zoo in this area are unsurfaced at the present time. Galaxie Avenue, which borders the zoo on the west, is gravel from Cliff Road to 127th Street West (existing County Road 38), and is bituminous south to CSAH 42. Galaxie Avenue is built within 66 feet of right-of-way and has an average daily traffic volume of less than 500 vehicles.

Near the southwestern corner of the zoo site 127th Street West ties into Galaxie Avenue. This is a bituminous roadway with 100 feet of right-of-way. 140th Street is unsurfaced east of Galaxie Avenue and serves an undeveloped area between Cedar Avenue and Galaxie Avenue.

Johnny Cake Ridge Road borders the zoo site on the east. From just south of the zoo site to CSAH 42, Johnny Cake Ridge Road is a two-lane bituminous roadway. This section has been graded with shoulders so that it can be upgraded to a four-lane design in the future.

At the time of this writing Johnny Cake Ridge Road from Cliff Road to just south of the zoo site is under construction. This section will be designed as a four-lane, non-divided bituminous roadway. Grading has been started and construction will be completed during the summer of 1977. The cities of Apple Valley and Eagan with Zoo Board and MN/DOT support successfully requested legislation from the 1976 Legislature appropriating $750,000 for upgrading this section of Johnny Cake Ridge Road. One-half of this amount will be repaid by the respective cities from future State Aid monies.

Cliff Road lies north of the zoo site and will be important as an interim access route to the zoo. Dakota County plans to reconstruct Cliff Road to a four-lane highway with turn lanes at major intersection east of Trunk Highway 13 to Johnny Cake Ridge Road. The intersection of Cliff Road with Johnny Cake Ridge Road will be signalized. A location-design public hearing will be held by Dakota County in May, 1977.

FIGURE 13

metro open space

county park

metro open space

state zoo

Specific locations of trails in County & Metro parks have not been identified.

transportation

APRIL 5, 1975

VEHICULAR

PRINCIPAL ARTERIAL

CLASS I (INTERSTATE FREEWAY)

CLASS II (FREEWAY OR EXPRESSWAY

MINOR ARTERIALS

FOUR/SIX LANES DIVIDED

FOUR LANES UNDIVIDED

COLLECTOR STREETS

TRANSIT

MIXED TRAFFIC EXPRESS

RIGHT-OF-WAY PRESERVATION

PEDESTRIAN

PRIMARY TRAILS

SECONDARY TRAILS

1000' 500' 0' 1000' 2000' 3000' 4000'

Cedar Avenue (CSAH 23) is one-half mile west of the zoo and has developed as the major north-south roadway in the area. This is primarily because it is the only Minnesota River crossing between I-35E and the Mendota Bridge, a distance of over eight miles. Cedar Avenue is presently a two-lane bituminous road with at-grade intersections. Land along this route is mostly undeveloped; however, there are scattered single and multiple family dwellings. Cedar Avenue is proposed to be constructed as a freeway section in Bloomington. This construction is expected to be completed in stages between 1979 and 1981.

I-35E is proposed to be constructed north and west of the zoo site in the early 1980's. This route is expected to carry most of the zoo traffic from the St. Paul area.

All other principal arterials, intermediate arterials, minor arterials and collector streets shown on the Transportation Plan exist as two-lane, unsurfaced roadways.

5. Residential.

Residential uses in the area are primarily single family residential subdivisions constructed by large-tract developers such as the Orrin Thompson Construction Company. The largest of these developments is the "Greenleaf" area lying south of the Zoological Garden, developed by Orrin Thompson from 1968 to the present time.

Other significant residential developments are: 1) Cedar Knolls area lying west of the Zoological Garden, developed by the Thorsen Construction Company since 1968. The area consists of about 400 mobile homes, several 24 to 30 unit apartment buildings, and some townhouses. 2) The Palomino Hills area, west of Cedar Avenue, developed by custom builders over the past 15 years. 3) The Eaton mobile home park located west of Cedar Avenue, which was constructed several years ago. 4) The Woodgate development located east of Johnny Cake Ridge, along Cliff Road which has both single family homes and quadrominiums.

In addition, the area has developed with small scattered single family subdivisions, most of which have been developing very slowly over the past several years.

6. Zoning.

In February of 1975 the City of Eagan adopted a new Zoning Ordinance which resulted in a reclassification of all Commercial Districts. The old Eagan Zoning Ordinance contained only two Commercial Districts, while the new Ordinance has six. Therefore, the reclassification of the two districts into the six

new districts for all commercial properties was required. The attached Zoning Map and corresponding view of the Eagan Zoning Ordinance will provide an indepth description of each district.

The City of Apple Valley currently is in the process of revising its zoning ordinance. Over the years, several sections of the zoning ordinance have been updated. However, a complete revision has not occurred since the original ordinance was adopted in 1965. Many of the classifications and in particular the commercial classifications are very consistent with what is contained in the new Eagan Zoning Ordinance.

There are certain areas of concern in regard to zoning or overzoning in both communities. In particular, there is a concern about certain commercial districts. These are discussed in greater detail in the Land Use Section of the Zoo Area Development Guide, related to commercial development.

7. Soils

An analysis of soils found in the zoo peripheral area point out limitations and considerations for development. These main properties are: 1) depth of the water table, 2) soil strength and stability, 3) shrink/swell with changes in moisture, 4) potential frost action, 5) steepness of slope, and 6) erosion.

Because the slope in the study area is such a dominant factor, it is considered separate from other soil properties that will influence development. A separate section is contained in the Zoo Area Development Guide which relates exclusively to slope.

Three groups of soils are generally found in the study area:

a) Low hills and knolls with many closed depressions - The majority of the study area is of this character, and is located in a wide band extending east and west. These soils consist of deep, loamy soils and loamy soils underlain by sand and gravel. The sand and gravel is closely intermingled with the loams so mapping cannot be done.

The water table depth occurs at more than five feet in all seasons. A seasonal perched water table can be expected at five to ten feet depth where soils are underlain with dense loam.

Other properties found in this area are stones and boulders which can hinder construction in certain areas. Also, a low to medium shrink and swell (volume change) can be expected with changes in moisture. Also there is a low potential for frost action.

Of particular interest to the developer is the fact that these soils have very adequate strength and stability for construction. These soils are permeable

with a generalized percolation rate of less than sixty (60) minutes per inch. A series of clay seals in the soil retard or prevent infiltration of surface runoff into the ground water. This would require a relatively large drainage field for an on-site sewage disposal system.

b) Rolling to steep slopes, underlain by sand or sand and gravel - These soils occur on the north and south borders of the study area. The soils material is generally two feet thick with a sand and gravel substratum. This sand and gravel is usually a good source for mining as evidenced by the number of sand and gravel operations in the Apple Valley area.

The water table in most places is below ten feet in depth in all seasons. The soil also has good strength and stability for development.

The soils in this group have rapid percolation rates, however, on-site disposal systems are a hazard because of the side-slope seepage ususally experienced. Drain fields on the slopes could pollute the ground water table rather easily. The soil also has a characteristic of low shrinkage and swell experienced with changes in moisture.

There is a severe erosion hazard during and after construction with these soils. It is very difficult to stabilize a cut bank of sand and gravel soil with vegetation practices.

c) Wet soils on flats and drainage ways and depressions - These soils occur sporadically in the two soil categories previously described. They have a seasonal high water table of one to three feet in depth. At certain places, these soils are subject to runoff from higher land. Wet soils have a high potential for frost action and because of the wetness, the bearing value is low to medium. Excavating and trenching operations require dewatering during wet seasons.

8. Slopes.

The most limiting development feature in the zoo peripheral area is the steep slope. These steep slopes occur in a disordered landscape, typical of a terminal glacial moraine area through the midsection of the study area. Visually, this type of topography is very appealing.

One-third of the study area has slopes of 18% or more. These slopes can be as great as 40%. The other two-thirds of the area is rolling terrain, generally beginning with a minimum 6% grade. Because the severe slopes (18%+) are intermixed with the lesser slopes (6% to 18%) large scale alterations are difficult without destroying the natural character of the terrain.

Careful planning and construction is needed on all sites. Any land developed with 18% slope or more would be so difficult to develop that it would be much

much better to maintain these areas as permanent open spaces and establish them for erosion and sediment control. This would mean that a simple leveling of land for development is unacceptable if extensive erosion and water conservation measures are not taken by the developer and the community over property which the developer does not control.

Fortunately, from a development standpoint, some of the areas experiencing the steepest slopes are contained in the permanent open space and in particular, in the recently acquired Metropolitan Open Space areas, located along the south boundary of the City of Eagan.

As noted in a review of the Slope Map (attached hereto as Figure 14), Apple Valley has already experienced some development in areas of steep slopes. The community and the developers have had some experience in coping with this situation.

9. Vegetation.

The most predominant vegetation feature in the zoo peripheral area is the distinct upland stand of oaks. See the Vegetation Map attached is Figure 15. Only from Cliff Road north is there an appreciable number of mixed hardwoods. With only a few exceptions, all areas south of Cliff Road are oak dominated.

a) Oak Dominates with Understory - The well-drained uplands contain black oak, red oak and white oak. Only on wooded edges and low depressions will one find elms and aspen. The understory in these areas consist of hazelnut, dogwood, small elms, small oak, chokecherry, sumac, currant, elder, and bramble. Where there is no understory, big bluestem and associated grasses exist. On north slopes and on ponding areas, canoe birch are often established.

b) Oak Grove With No Understory - The red oak, black oak, and white oak are often found throughout the study area as small farm wood lots. They are often on slopes less than 12% and apt to have been adapted to grazing. Big bluestem and associated grasses usually form the wood lot floor.

c) Mixed Wood With Understory - This plant category includes a variety of landscape forms; isolated willow and cottonwood trees growing at a pond's edge, to a dominant hardwood forest mixture. The types of trees found is basically determined by the hydrology of the area. On higher, dryer ground (upland ridges) oak with sumac, prickley ash and wild plum are found. On lowlands, elms, soft maples, basswood and ash are found, with a dense undercover of hazelnut, chokecherry, currant, brambles, hawthorne serviceberry and black cherry.

In many of the depressions, aspen, willow, cottonwood and box elder are growing in large masses. The wetland understory plants found in these areas are dogwood and elder.

SLOPES

AREAS IN EXCESS OF 18% SLOPE

AREAS OF LESS THAN 18% SLOPE

SOURCE: URBAN PLANNING & DESIGN, INC.
INTERPOLATED FROM USGS MAP.

APRIL 5, 1975

1000' 500' 0 1000' 2000' 3000' 4000'

FIGURE 15

VEGETATION

- OAK DOMINANCE WITH UNDERSTORY
- OAK GROVE WITH NO UNDERSTORY
- MIXED WOOD WITH UNDERSTORY
- EVERGREEN PLANTINGS

SOURCE: URBAN PLANNING & DESIGN, INC.

APRIL 5, 1975

1000' 500' 0 1000' 2000' 3000' 4000'

On north slopes and on pond edges, many canoe birch are mixed with the hardwoods.

There is no definite separation of the various upland and wetland plant associations. All plant associations are well mixed due to the irregularities of the topography in this area.

d) Evergreen Plantings - A few areas in the study area have evergreen plantings. These have been planned as "shelter-belts", "windbreaks", or to forest an area. Some pines have naturalized with the native hardwood forest.

10. Protection Open Space.

a) Holding Pond Areas - The respective cities of Eagan and Apple Valley have designated certain existing wet areas as either present or future storm water holding ponds. These are illustrated on an attached Exhibit 16 entitled "Protection Open Space". These are also illustrated on the Storm Drainage Plans prepared for each community by the cities' consulting engineers, Bonestroo, Rosene, Anderlik and Associates. Details of how they are interrelated can be obtained from these storm drainage plans.

b) Major utility Easements - A number of gas lines traverse the study area. One gas line is located on and through the Zoological Garden.

c) Scenic View and Scenic Corridors - There are many high points in this upland region which, because of extreme topographic relief, provide panoramic views of the surrounding area. Some views are toward the Minnesota River Valley with the skyline of the Twin Cities in the background.

d) Ground Water Recharge Area - The recharge area is an indication that to the north of the study area a major ground water aquifer is being recharged. The specific location and data related to this recharge area is contained in a report entitled "An Ecological Study of the Twin Cities Area" - Wallace McHaeg, Roberts & Todd.

protection open space

APRIL 5, 1975

SCENIC VIEW

SCENIC CORRIDOR VIEW

HOLDING POND AREAS

MAJOR UTILITY EASEMENTS

1000' 500' 0 1000' 2000' 3000' 4000'

SECTION 3

probable environmental impacts and mitigation of adverse effects

A. Introduction.

The success of the Minnesota Zoological Garden from a strictly biological perspective is largely dependent upon the development and maintenance of a high quality environmental setting within the site area. While some of the site area will undergo significant alteration, the guiding principle has been and will remain to minimize serious environmental disruption of this area. In addition to the site development considerations, two other areas of concern are: the zoo access roads; and development in adjacent areas which might result from zoo stimulation. This section will deal with those areas of concern.

B. Zoo Site Evaluation.

1. Planning.

The Minnesota Zoological Garden was designed only after detailed study of alternative zoo concepts. This resulted in a Metropolitan Council Development Guide section setting out policies for large acreage, openness and emphasis on the use of the existing environmental conditions. Subsequent planning by the Metropolitan Council developed a zoo/park concept. While the county/metro park has not been fully implemented, a major portion of the proposed park area is being acquired.

The site selection and the overall environmental setting have been considered and approved in a range of planning approaches including the comprehensive plan, official maps, zoning, park plans, sewer plans, and zoo master plans. Consideration has included the Minnesota Zoological Board, Metropolitan Council, Dakota County, Apple Valley and Eagan.

The proposed action is in accord with all current planning related to a Minnesota Zoological Garden.

2. Development.

Acquisition, final design and construction have proceeded after careful planning, detailed evaluation of alternatives, and substantial public review of site selection and development approaches.

No apparent modification in design would alter the effects of the proposed action. The do-nothing alternative would permit full development for other uses, an alternative having a more damaging effect upon the environment.

Acquisition has proceeded with care and appreciation for the social impact. No resident has been forced to leave. Three have present life estates. One resident sold partially because he wished to move out of the state. The second purchase of a residence is being done under an option secured after the owner

offered it for sale on the open market. The option permits the residents to build another house before moving from the house being purchased. There is no significant change in the residential uses at the zoo site itself.

The site itself is being physically altered. About 1/3 of the comparatively open farmland will become developed area. The Northern Trek will make maximum use of the existing topography and vegetation. The grading contract includes defined work boundaries for the contractor as well as specific identification of trees to be preserved within those boundaries. Grading is primarily for roadways, utility right-of-way, and developing the natural moats and barriers of the outdoor exhibits.

The major alterations will be from the structures and parking lot (designed to accommodate 2,500 cars). Structures are being sited to avoid major destruction of vegetation, and where possible, structures are being hidden by or partially buried into the natural topography.

The parking lot will significantly alter existing vegetation and topography. Trees will be protected and retained where possible. Landscaping will be used to provide parking lot separations by tree-lined walkways. Natural drainage patterns will be assisted by some storm sewers and will drain into existing ponding areas. With a significant amount of parking retained in gravel surface the drainage impact should be minimal.

During the construction period there will be movement of construction equipment and construction noise reasonably similar to the construction equipment and noise for residential construction now taking place around the site. Careful design and construction will avoid any significant effects.

3. Relocation.

No relocation has been necessary. If relocation were required assistance would be provided in accord with State and Federal regulations.

4. Social.

The social impact could have been greatest on the three elderly resident families on the site. All have been given life estates. There is no significant social impact.

Police, fire and medical needs could place a burden on surrounding communities if not carefully planned. Traffic congestion is possible on peak days.

Working agreements on fire protection and zoo security needs are being pursued with Apple Valley pursuant to the planned development agreement for the zoo. First aid will be available on the site, and emergency medical care is available

from the Apple Valley Medical Center. Zoo provision of basic services should avoid any undue community burdens. This conclusion is reinforced by the Apple Valley report on other zoos (see Appendix 16).

5. Air and Noise.

Air quality will be altered somewhat. There will be some animal odors. Increased automobile traffic (transit is not yet available at major service levels) will add to the chemical and noise content. Heating and incineration exhaust will add some potential for odor and chemical content.

Construction noise, while not intense by comparison with surrounding construction and present motorbike use, will continue for about two years. Restriction of night activity can be considered if noise is a problem.

The siting of animal exhibits in the interior areas of the zoo, together with the dispersed nature of the exhibits, will avoid any significant odor problem.

Use of transit has been discussed with the Metropolitan Transit Commission and a transit study is now being conducted. Increased transit use, plus adequate access roads to avoid major stacking and idling will avoid automobile air pollution.

6. Water Quality.

Ponding of water runoff within the exhibit areas will permit some percolation of polluted water. However, soil characteristics do not permit significant percolation into the water table. The compost area will be drained to avoid ground water effects. Surface water may have to be maintained by shallow wells for asthetics. Shallow ground water supply is adequate.

Drains into the sewer system will be used in exhibit areas where percolation could be a problem. The compost area will be drained to the sewer system. Deep well water could be used if necessary to avoid loss of shallow ground water supply.

7. Erosion and Sedimentation.

There will be some erosion and sedimentation during construction, particularly in the parking lot area. Plantings and seeding or sodding will be used to stabilize soils on slopes in all areas except the perimeter fence. There vegetation must be prevented in a 15 foot clear space on the interior of the fence. Limited paving or rip-rap will be used in such areas.

Sedimentation will not be a long term problem. Stabilization of soils and zoo maintenance of the natural conditions on the site will correct any problem.

Protection of these slopes against erosion will be controlled on the zoo site by means of the following measures:

1) Wood fiber type #4 will be used around buildings.
2) A straw-asphalt mulch will be used on the Northern Trek (200 gallons asphalt : 2 ton straw per acre).
3) Seeding mixture of bluestem, sidecoats grama and blue grama will be used as an erosion-proof prairie-type cover that will stand up through the snow. This mixture should grow 18 to 24 inches tall. It will anchor very steep slopes.
4) Rock rip-rap will be used to stabilize perimeter slopes.
5) Fertilization will increase establishment success of seedings. Application rate will be 400 pounds per acre using 17/17.
6) A short grass prairie mixture is suggested for future use in the parking lot area.

Every effort should be made to protect lands with a slope of 18% or more.

8. Vegetation.

Some trees will be removed and natural habitat will be altered. Disruption from site work could cause reactivation and spread of oak wilt.

Trees over 6 inches are all identified and if not diseased, will be protected during construction. Where necessary to clear trees, some of the dead trees will be used as part of animal exhibits. Others will be chipped for use on site for paths.

All tree disease problems have been identified. Most diseased trees will be removed. Spread of disease will be avoided by barriers, trenches, and immediate treatment for any injury to a healthy tree. Elms may be largely eliminated to avoid dutch elm disease.

Major landscaping programs will be used to return the site to a fully natural appearance.

9. Wildlife.

As noted earlier, portions of Zoological Garden habitat will be altered and all areas will be restored to the extent possible. It will be necessary to remove by trapping and relocating several species of mammals and birds. It is estimated that there is a population of white-tailed deer on the site numbering less than ten. These deer evidently do not over-winter on the site due to short food supply but remain on the site during the early spring, summer and fall, migrating to the river valleys for the winter. Because of U.S. Department of Agriculture concerns about the transmission of disease,

any deer that remain on the site will, of necessity, be removed and relocated if they persist. In addition, predators such as foxes, raccoons, weasels, owls and hawks which may prey on captive zoo species will, of necessity, be trapped and relocated if their presence results in incompatible predatory activities on captive zoo animals. All trapping of native wildlife will be coordinated with the Minnesota Department of Natural Resources.

With the above exceptions, it is expected that all species referred to earlier can be maintained on the site as a natural occurring phenomenon and will, because of site protection, probably increase in numbers.

The zoo will conduct appropriate programs to encourage the use of the site by its resident populations of birds, mammals, amphibians and reptiles.

In order to meet U.S. Department of Agriculture requirements, a ten foot fence, including a fifteen foot clear space to the interior, has been erected to avoid the transmission of diseases between domestic animals or existing wild hoof stock and the Zoological Garden animals. It is also anticipated that livestock operations present within a three mile limit around the zoo will be gradually phased out. These operations would apply only to split-hoofed animals and commercial poultry industry.

Also to avoid the transmission, certain pest species including rats and wood ticks will have to be controlled through the use of zoo personnel specially trained to carry out such programs.

In summary, with the exception of white-tailed deer mentioned above and certain large predators which may of necessity require trapping and relocating, it is expected that the design and operation of the Zoological Garden will, in fact, enhance the habitat for those species of animals which have occupied the site in the past; while in addition providing the visitor an opportunity to view these creatures and their habitats in a significant and interpretive way.

10. Energy Use.

Energy use is significant, but methods for providing heat, light, and power have been carefully studied. Structures are designed for significant energy savings over traditional construction.

The zoo has carefully reviewed energy sources and energy conservation techniques. Heating plant design will permit modification for future use of coal or potential fuels such as solid waste. The necessary gas and electricity are available at the site. Oil storage is provided and coal storage can be built. Energy use should be less than if the land area were used for residential and commercial development.

11. Visual Impact.

The design of the zoo has been directed toward a minimum visual impact from the development. Animals are contained behind hidden barriers such as moats. Animal barns and dens are out of visitor view. To the extent possible, fencing in visitor areas will be black vinyl or painted black to reduce visual impact.

The proposed zoo ride would be constructed on a guideway which would be visible. However, the final ride selection is being based upon consideration of environmental and visual impacts. The guideway sought will be a minimum profile.

Structure profiles are reduced by laying them into existing land form where possible. Landscaping and design of the parking lot will avoid the traditional sea of pavement.

Entries to the zoo should also maintain the same natural setting characteristics if possible.

C. Zoo Access Evaluation.

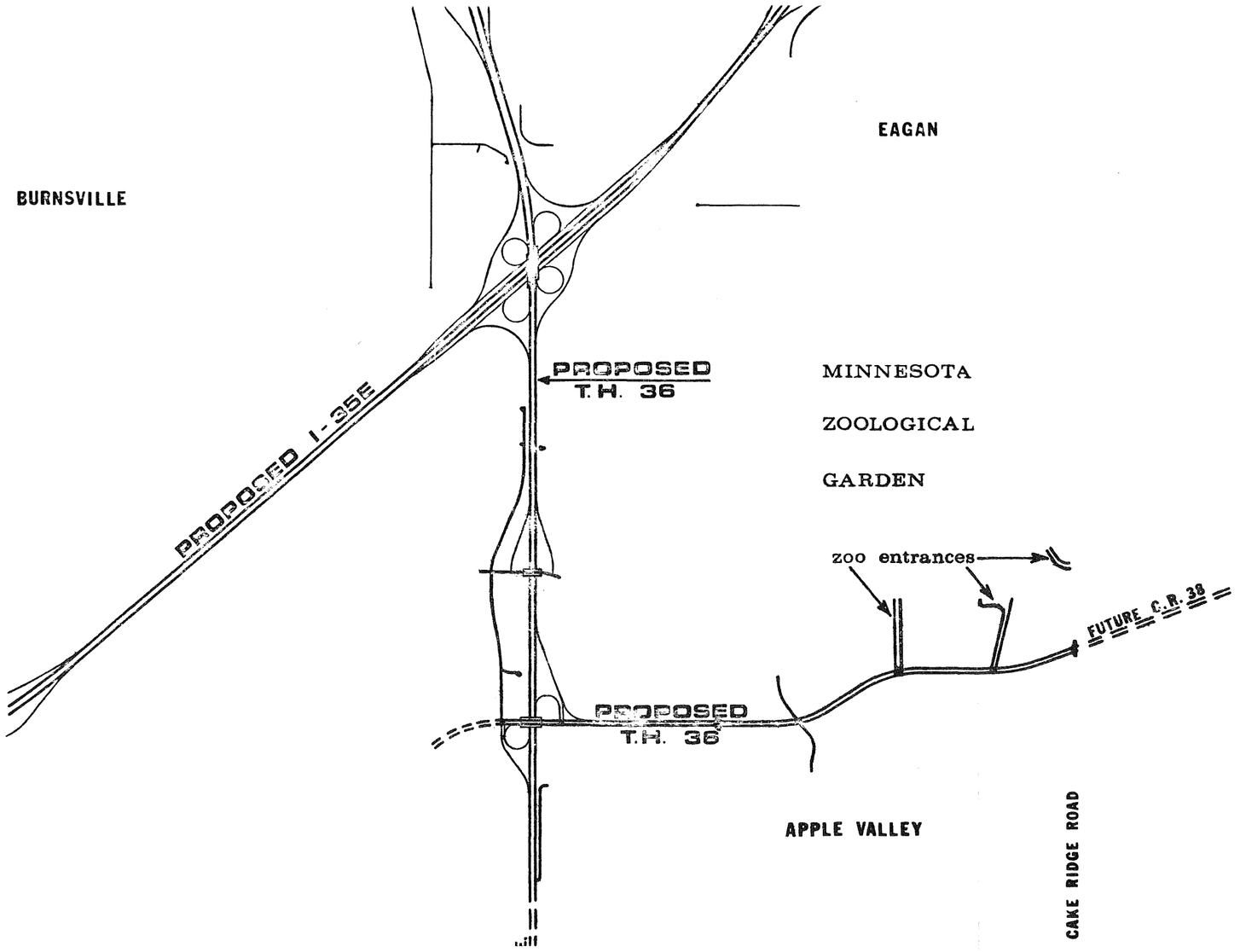
1. Development.

Residential and commercial development of the land adjacent to and south of the zoo (approximately 220 acres) is expected to occur as the proposed zoo access road is constructed. The western 140± acres is being proposed as a Planned Unit Development (PUD) with a maximum density of 504 units. Zoo related commercial development is proposed for the eastern 80± acres.

A total of five at-grade intersections are proposed along the east-west section of the zoo road. These intersections are proposed in order to adequately serve the zoo and proposed residential and commercial developments. These intersections include: Galaxie Avenue, the two spur roads into the zoo, Johnny Cake Ridge Road, Foliage Avenue (north and south access to property lying between the zoo entrances) and Galaxie Avenue. See Figure 16A for the locations of these access points.

Other development in the Apple Valley area may occur indirectly because of the generally better access the zoo road would provide.

A Zoo Area Development Guide was prepared by the agencies involved in the zoo planning (i.e. Apple Valley, Eagan, Metropolitan Council, Minnesota Environmental Quality Council, Minnesota Department of Transportation, and Minnesota Zoological Board). This guide outlines a procedure for reviewing and approving proposed developments within approximately three miles of the zoo. This approach gives all interested planning bodies a voice in controlling local development.


BURNSVILLE
EAGAN
PROPOSED I-35E
PROPOSED
T.H. 36
MINNESOTA
ZOOLOGICAL
GARDEN
zoo entrances
FUTURE C.R. 38
PROPOSED
T.H. 38
APPLE VALLEY
CAKE RIDGE ROAD

2. Relocation.

Approximately six to ten single family residences will be acquired as a result of the construction of the Selected Alternate A. These homes are located along the Cedar Avenue section.

The social and psychological impacts of relocation may include changes in perceived well-being of the relocates and feelings of anxiety, confusion and/or stress over moving. Although these impacts are immeasurable, they can be lessened. Particularly important is the case in which relocated families and individuals can find and acquire comparable replacement housing within areas providing similar services as their previous residence.

With the growth that is currently occurring in the Apple Valley and surrounding suburban areas, no problems are anticipated in finding suitable replacement housing for the families and individuals.

There are two businesses located in the roadway project area. It does not appear that this alternate will significantly affect operation of these businesses, however, this would be determined during the final design process. If there is a need to acquire these businesses opportunities do exist for finding available replacement building and new construction sites for business relocations.

The MN/DOT and all acquiring authorities operate under the Uniform Relocation Assistance and Real Property Acquisition Act of 1970. Families displaced by the highway will be relocated in the same general neighborhoods, if possible. It is the policy of the MN/DOT that:

a. No person shall be displaced by a construction project unless and until adequate replacement housing has already been provided for or is built and has been made available to all affected persons regardless of their race, color, religion, sex or national origin.

b. That services and payments shall be provided all relocatees within the limits of laws and administrative procedures established by the State.

C. No person lawfully occupying real property shall be required to move from his dwelling or to move his business, farm operation, or non-profit organization without written notice of at least 90 days prior to the date such move is required.

A design hearing will be held by MN/DOT on the Selected Alternate A. At the time of this hearing design comments will be solicited. Following the Federal Highway Administration approval of the design the detailed design process begins, and specific acquisitions are determined. If the project commences as planned residential acquisition will begin in 1978.

Relocation assistance will be provided by the MN/DOT. Each family displaced will be contacted by a relocation advisor who will help find housing that meets the requirements of "decent, safe and sanitary" and explain the payments for which the displaced families are eligible.

3. Social.

Social impacts that may occur as a result of highway construction include the following:

a) Relocation effects.
b) Disruption/alteration of employment, shopping, or social interactions.
c) Interference with the provision of local services.

No serious problems have become apparent relative to any particular category of people (i.e. elderly, school-age children, handicapped, racial groups, etc.) having access problems to jobs, schools, churches, parks, hospitals, shopping and community services as a result of this project.

People that may have special problems in adjusting to changes in living patterns or in the physical and/or emotional act of displacement are generally those who are less mobile, transit service oriented and dependent on local services. Other groups who may encounter additional problems in relocating are the elderly and racial, ethnic or religious minorities.

Within the zoo road project area, individuals reflecting the above mentioned characteristics are not present in significant numbers. Less than one percent of project area residents are 65 years of age or older. There are few non-white, foreign born or first generation descendents of foreign born, or other ethnic or religious minorities residing in the project area. Approximately 95 percent of project area families owned two or more automobiles. This and the relative absence of local service centers reflects a high degree of mobility and lack of dependence on the local area for the provision of services.

The construction of the Selected Alternate A should not significantly affect employment, shopping or social interaction. Within the project area there is little pedestrian traffic, and a high dependence on the automobile to facilitate interaction.

A half diamond interchange to the north at 127th Street West if approved and constructed will provide access for neighborhoods west of the zoo on both sides of Cedar Avenue. This access point eliminates an extra two mile drive for north-bound traffic. This interchange will provide access to the Palomino Hills area and the residential development in the southwest quadrant of proposed I-35E and Cedar Avenue.

4. Air.

This air study was done to determine carbon monoxide (CO) emission levels along the proposed zoo road. CO emission levels were determined in parts per million (ppm) by using the EPA's Volume 9, Evaluating Indirect Sources method of calculation.

Four receptor sites were chosen:

Site 1: A location between T.H. 36 and Galaxie Avenue on the proposed east-west zoo road alignment.

Site 2: A location just west of the westerly zoo entrance intersection.

Site 3: A location between the zoo entrances.

Site 4: A location on Decar Avenue, south of CSAH 38.

The receptors at these sites range from 150' to 400' from the edge of the roadway. Anticipating low results in CO level at these distances, it was decided to calculate the readings at the Right-of-Way line. Therefore, any receptor beyond the Right-of-Way line can be expected to have lower CO concentrations.

Using the year 2000 traffic volumes and the 1978 emission factor of 0.7, the one and eight-hour average CO concentrations were developed for each site.

By the year 1990, improved vehicular emission controls are predicted to lower the emission factor to a minimum of 0.2. Again, using 2000 traffic, the CO concentration at each site was figured. The results in ppm were as follows:

	1980		1990	
Site	1 Hour	8 Hour	1 Hour	8 Hour
1	6.0	2.3	1.7	0.7
2	15.3	5.0	4.4	1.5
3	5.5	2.6	1.6	0.7
4	9.1	3.3	2.6	0.9

These values can be compared to the one-hour MPCA standard of 30 ppm and the eight-hour standard of 9 ppm not to be exceeded more than once per year in either time period. This analysis indicates that the standards will not be violated by construction of this project.

The documentation provided is intended to assist in determining the consistency of this improvement with the State Implementation Plan.

5. Noise.

Laws, regulations and standards have been established to control noise pollution. Federal and State standards have established noise levels for various types of land uses. The State noise levels, as of April 1, 1976, are still considered as desirable goals since enforcement regulations have not been issued.

Noise Standards (Exterior)

	Residential	Commercial
Federal	L_{10}^{70} dBA *	L_{10}^{75} dBA
State - Day	L_{10}^{65} dBA	L_{10}^{70} dBA
State - Night**	L_{10}^{55}	L_{10}^{70} dBA

** Night is 10:00 PM to 7:00 AM.

* L_{10}^{70} dBA means the 70 dBA noise level will not be exceeded for more than 10% of the time.

The existing land uses which will be affected by noise from this highway are predominately multiple-family residential (two and three story building). Only a few single-family residences will be close enough for consideration since approximately seven nearby houses are to be acquired for construction. Future land uses are expected to be mainly residential, since the area's overall development plan is to restrict land uses to those which are considered appropriate to the Zoological Garden.

Ambient noise levels in the vicinity of the zoo ranged from L_{10}^{64} dBA to L_{10}^{68} dBA at similar sites along Cedar Avenue. Future noise levels were predicted using the accepted N.C.H.R.P. 117/144 method.

The year 2000 traffic forecase for this project shows a large volume increase over present volumes due to the expected development of this area over the next twenty years. The Zoological Gardens representing only a small part of this growth.

Projected Traffic Volumes for the year 2000 are:

Segment	A.D.T.	Truck %
North-South	55,800	4
East-West	20,900	3 to 5

250 feet from highway centerline on the north-south segment and 200 feet on the east-west segment. The area's topography and highway design will provide shielding to bring the 70 dBA level closer than 200 feet from the roadway.

This preliminary noise analysis can identify a potential noise impact on six individual residential land uses (3 residences and 3 apartments) along Cedar Avenue on the north-south segment. The rolling terrain will allow extensive use of natural topography for shielding. The north-south segment is basically a depressed section which can be effectively shielded without excessive heights.

The east-west segment, which has no developed land uses, is an expressway design with proposed residential land uses adjacent to it. Extensive landscaping mounding is planned for this segment to provide an attractive entrance for the Zoological Gardens. Combined with the proper residential site planning, this segment should create no noise impact on adjacent land uses.

No exception to Federal design noise levels is expected to be needed for this project. A detailed noise analysis will be made for the Design Study Report. As the final design of the highway progresses, it will be reviewed for any additional adverse noise effects on existing or future land uses.

> "Minnesota Standard Specification for Highway Construction, Sec. 7, Subsection 1701, on Construction Noise states in part that the contractor shall comply with all applicable laws, ordinances, regulations, orders and decress in the performance of the construction. This would include any local noise control laws. No unique noise receptors have been identified in the areas that would be impacted by the proposed construction and the construction activity is not expected to generate unusual or excessive noise."

6. Water Resources.

The Selected Alternate A will have effects on water resources within the project area. These include:

a) Elimination of several small ponding areas by the paved road surface.

b) Addition of runoff from the paved surface increasing the volume of runoff held in adjacent depressions and wetlands.

c) Water quality of some wetlands and lakes may change from the addition of sediment, de-icing salt and other chemical constituents.

Curb and gutter, water catch basins, connecting to an underground drainage system will be built as part of the project to carry storm water from the highway right-of-way. This system will be planned in coordination with Apple Valley plans to drain other nearby developments and construct a storm water sewer system.

Pipes carrying runoff from the highway will outlet into existing, or where necessary, constructed ponding areas. In these ponding areas sediment will settle or be trapped and overflow will be channeled via stormwater sewer systems into surrounding lakes.

Apple Valley storm water drainage plans show water from the ponding areas adjacent to the zoo road draining southeast to Long Lake and Farquhar Lake. Both lakes are shallow and wind action will provide thorough mixing of the entire water bodies.

Neither of these lakes should become meromictic as a result of the construction of the Selected Alternate A. Meromictic means that during spring and fall when deep lakes normally mix or turn-over, mixing does not occur.

There are no rivers and streams located in the project area. Surface water presently drains into many scattered wetlands. (Wetlands have been categorized according to the U.S. Department of Interior, Fish and Wildlife Service, Circular 39.) Of the wetlands in the project area, Types 1 and 2 dominate.

Several small Types 1 and 2 wetlands may be displaced by the Selected Alternate A affecting a total of approximately 2.4 acres.

Other Types 1 and 2 wetlands in close proximity to the roadway may be affected by increasing volumes of surface runoff from the road. Higher water levels, as a result of increased runoff, will benefit waterfowl and aquatic habitat in many of the Type 1, 2 and 3 wetland areas. However, if salt tends to accumulate in ponding areas adjacent to the roadway the aquatic flora may become dominated by salt tolerant species. However, this is not expected to occur.

Wetlands Types 2 through 5 are considered the most productive for waterfowl and aquatic fur-bearing mammals. Visible vegetation on Types 2 through 5 wetlands consists of mostly cattails and marsh grasses.

There appear to be no Types 3 through 5 wetlands displaced by the Selected Alternate A. However, the proposed interchange at the location where Dakota County plans to relocate and extend County Road 38 and the frontage road paralleling Cedar Avenue to the north of this interchange may displace two Type 3 wetlands of small size.

7. Erosion and Sedimentation.

The area through which the Selected Alternate A will be constructed has rolling topography and some steep slope areas. As such, the possibility of accelerated erosion and subsequent sedimentation does exist on this project. Uncontrolled

erosion can eliminate plant growth, seal natural soil openings, and thereby increase runoff and reduce the storage capacity of neighboring ponding areas, as they fill up with sediment.

Sedimentation can be minimized by employing a number of erosion control techniques. Significant among these techniques is keeping the construction zone as small as possible and reducing the amount of time the roadway is exposed to wind and water. Other erosion control measures which will be considered in the construction of the Selected Alternate A include:

1) Reestablishment of turf as soon as possible.

2) Sodding of ditch bottoms and incorporation of flumes.

3) Mulching of slopes during the interim between construction and reseeding.

4) Sodding of berm areas where erosion potential is likely.

5) Construction of temporary sediment basins may be built prior to major construction.

Recommendations on the need for any of the above mitigative measures to lessen the impact of soil erosion will be formulated during the detailed design stage of this project. The grade on cut or fill slopes will be constructed at a grade of 3:1 or flatter, wherever possible to minimize erosion potential.

8. Traffic Forecasts.

Traffic forecast volumes for the year 2000 have been prepared by Mn/DOT (see reference pp. 67-68). These forecasts in report form are available upon request from the offices of the Minnesota Zoological Garden.

The traffic forecasts incorporate zoo patronage estimates and the latest Metropolitan Council traffic forecast data for non-zoo related trips.

Projected traffic volumes for the year 2000 are as follows:

Segment	Average Daily Traffic (Two-Way)	Truck %
North-South	55,800	4
East-West	22,900	3

Projected traffic volumes for the year of zoo road opening, 1981, are as follows:

Segment	Average Daily Traffic (Two-Way)	Truck %
North-South	24,000	4
East-West	12,000	*

*Truck volumes on the East-West section of the zoo road will not approach the estimated 3% until Dakota County constructs C.R. 38 on either side of the East-West section of the Zoo Road.

One way of measuring the quality of traffic service relative to present or future traffic is the "level of service" technique. This method evaluates how well traffic is flowing on a given roadway. By analyzing speeds, volumes, geometrics (number and width of lines, grades, curves) and highway type, the "level of service" can be determined. The full length of service spectrum is separated into six parts labeled "A" through "F". Level of service "A" is "free flowing" traffic with little delay and level of service "F" is "severely congested" traffic with considerable delay.

Both the North-South section and East-West section of the zoo road will adequately accommodate all weekend traffic. The East-West section will provide adequate service for all weekday travel. The North-South section will not accommodate peak-hour weekday traffic at a desirable level of service as currently designed.

On the North-South section of the zoo road, south of 35-E "weekday" A.M. and P.M. peak hours of travel (mostly work trips) may experience unstable traffic flow and momentary duration stoppage.

The North-South section of the zoo road will be designed and constructed as a four-lane freeway with a wide median to allow for the addition of one lane in either direction. Construction of this additional lane will occur if and when needed. Dakota County has similar design plans for CSAH 23 from the zoo road to County Road 42.

9. Visual Impact.

Visual impact will be largely dependent upon the final roadway location and design, and it is also dependent upon the future development of land adjacent to the roadway.

The overall theme of the landscape design plan is that of rustic parkway character. It is composed of grasses and legumes, wildflowers, shrubs and half-trees. The North-South section of the zoo road is being basically depressed (Figure 5) and is designed with shrubs as a key element integrating slopes and mounds into a more natural appearance. The East-West section is

composed of both cuts and fills shown in Figures 6 and 7 with no grade separations proposed. Major emphasis is placed on the East-West section for developing the naturalistic feeling of the roadway with grasses, legumes, ground covers, wildflowers, shrubs and half-trees.

The landscape design of the zoo road should reflect the native vegetation of the oak association and blend into the rolling terrain. Specifically, the judicious planting of native or adoptive materials is desirable for:

- Framing desirable views and screening out undesirable ones;
- Adding variety and interest in the approach to the Zoological Garden;
- Guiding traffic;
- Improving appearances from and looking toward the zoo road;
- Integrating any noise abatement barriers or mounds into their natural setting;
- Protecting slopes against erosion, and integrating them into a natural setting;
- In medians, forming natural buffer to collissions and headlight glare.

The choice of plant materials will be further studied as this project goes into detail design. However, the following is a partial list of plant materials that may be used:

Large Shrubs/Understory Tree

Tatarian Honeysuckle
Ginnala Maple
Buffalo Berry
Pin Cherry
Wild Plum

Shrubs

Sumac
Viburnums
Pea Shrub
Dogwoods

Ground Cover

Polygonum

Vines

Bittersweet (on fences)
Englemann Ivy

Wildflowers

Black-eyed Susan
Purple Cone Flower

Legumes

Creeping Alfalfa
Birds Foot Treefoil
Crown Vetch
Perennial Sweet Pea

Further, the use of landscape elements as lighting, grading and billboard control and easements should provide for total environmental enhancement.

Lighting - Light standards should have a simple design and earth tone color such as weathered steel.

Grading - Gentle grades (3:1 or flatter) will be constructed on slopes or mounds to reduce erosion and improve aesthetic appearance. Also, contoured grading should be utilized to blend in cut or fill areas as according to Minnesota Department of Transportation Design Manual. Slope areas of uniform nature through a cut and fill results in formal or stilted appearance. This can be softened by flattening the slopes on the ends where the cut or fill is light and gradually steepening to the maximum slopes in the middle of the cut or fill.

Billboards - Billboards and other advertising signs as off-premise signs should be prohibited along the highway right-of-way. On-premise signs should be controlled. Both types of signing should be controlled by the City of Apple Valley.

Easements - A right-of-way width of 225 to 320 feet is proposed for the North-South section of the zoo road. This right-of-way width is necessary because of the four-lane, wide median freeway design. Noise abatement mounds can be constructed within these limits. Desirable grades on cut and fill slopes can also be constructed within these limits.

A right-of-way width of 150 feet is proposed for the East-West section of the zoo road since the design is a four-lane divided expressway. An easement of 50 to 75 feet on either side of the roadway would be necessary in some areas to properly blend cut or fill slopes into the existing terrain. If trees and shrubs could be preserved in the easement area, they would provide a valuable buffer between the road and proposed development. This width is necessary in carrying out landscape concepts both in preservation of existing trees and shrubs but also for adding of supplementary plant materials. Easements could also provide space for a pedestrian/bike path which is proposed along the East-West section of the zoo road.

A supplemental study for this Final Environmental Impact Statement has been prepared that contains more detail on landscape design concepts. Copies of this supplemental study are available upon request.

The visual impact of the expected development associated with the access road will be controlled by the adoption of the Zoo Area Development Guide by the communities.

10. Impact on Protected Lands (Section 4(f) Lands).

The Selected Alternate "A" has been reviewed to determine the possible involvement of lands and properties falling under the provisions of Section 4(f) of

the Department of Trasnportation Act of 1966. Section 4(f) land may be any of the following: park and recreational lands, wildlife and waterfowl refuges, and historic sites. Use of this land requires a Section 4(f) statement documenting a determination that there are no feasible and prudent alternatives to the use of Section 4(f) lands.

Selected Alternate "A" has no involvement with Section 4(f) lands.

The Minnesota Historical Society has conducted preliminary surveys of the alignment for the identification of any potential historic sites. A more extensive analysis will be conducted during the summer of 1977. There are no sites within the corridor alignment currently or proposed for inclusion on the State or Federal Register of historic sites.

11. Related Access Roads and Interim Access Routes.

The traffic flow conditions expected during certain critical time periods have been analyzed for the zoo opening in 1978. Existing roadway geometrics (lanes, traffic control devices, etc.) were used as well as scheduled improvements anticipated before (or close to) opening. Recent traffic volume counts expanded to 1978 (non-zoo) and zoo generated traffic anticipated at opening were combined. Level of service calculations at critical intersections near the site were then made to assess whether traffic problems are likely and their probable extent. For this analysis three basic time periods were analyzed including:

- Average summer weekday
- Average summer weekend
- Peak days

There are also three major improvement projects scheduled before or close to zoo opening. Johnny Cake Ridge Road from just south of the zoo site to CSAH 42 has been upgraded to a two-lane bituminous roadway with the option of becoming four-lane in the future. Johnny Cake Ridge Road from Cliff Road to just south of the zoo is under construction to be designed as a four-lane, non-divided bituminous roadway. This project will be completed during the summer of 1977.

The four-lane upgrading of Cliff Road is now scheduled for a fall 1977 contract letting. It appears the construction will probably not be completed by the planned zoo opening in May of 1978.

The county also has plans to upgrade Pilot Knob Road during the time period corresponding to zoo opening.

Taking the road improvement schedules and time periods into account, the analysis can be summarized as follows:

Average Summer Weekday - Current traffic problem areas already exist during weekday rush hours (apart from zoo traffic additions). Traffic problem areas include the congested intersections at TH 110, 55 and 13. Also, the narrow Cedar Avenue bridge and two-lane section on each end of it are a capacity bottleneck. I-35E is also at capacity during rush hours in the heavy flow direction. Some intersections along TH 13 (Cliff Road, County Road 30, Cedar Avenue, and Yankee Doodle Road) are quite crowded although not above capacity. Zoo traffic will tend to have a rather minimum worsening effect on these problems. The average summer weekday zoo attendance will be less than one fifth of the peak day attendance. Traffic volumes of about 1,800 vehicles per day can be expected. They will be spread out on the various approach routes with the majority coming from the northeast and northwest areas. Volumes added to Cedar Avenue and TH 13 due to the zoo are not very significant compared to total volumes. Cliff Road volume additions, while more significant in terms of percentages (10% to 30%) are not of a magnitude to cause any major traffic problems provided it can be kept open during construction of the four-lane facility. Johnny Cake Ridge Road will be a four-lane design with much excess capacity when the zoo opens in 1978.

Average Summer Weekend - Average summer weekends are expected to attract about 16,275 zoo visitors per day in addition to any non-zoo weekend traffic. After the four-lane upgrading of Cliff Road is completed, it does not appear there will be major congestion problems, even though traffic will be quite heavy. Until construction is completed on Cliff Road there will likely be a rather high level of congestion on two-lane portions of Cliff Road especially at the Johnny Cake Ridge Road intersection.

Zoo Peak Days - Attendance during certain holidays and nice summer weekends is expected to be much higher than average -- more than double the average summer weekend figures (30,000 to 40,000 visitors per day). These high attendance times are expected to occur about seven or eight times a year. A high degree of congestion along Cliff Road at TH 13, Cedar Avenue and Johnny Cake Ridge Road can be expected especially until Cliff Road upgrading is completed. In addition, without completion of the main zoo road (35E to Johnny Cake Ridge Road), the east zoo entrance will be very congested as well. There will be some congestion at Johnny Cake Ridge Road and CSAH 42, but less severe than at the other intersections noted above. During these peak days, mitigative measures could include use of transit and carpooling, greater use of park-n-ride sites (at I-35W and TH 13). In addition, zoo visitors could be advised not to use roads near the zoo during peak hours (early and late afternoon). Constructing the East-West portion of the zoo road (between Galaxie Avenue and Johnny Cake Ridge Road) would tend to relieve the east zoo entrance and the Cliff Road/Johnny Cake Ridge Road intersections. The timing is questionable due to the uncertainty of negotiations necessary with landowners. Until the major road improvements planned in the area are completed (I-35E, the zoo road, and TH 36 in particular) certain highest attendance days will likely have severe congestion

associated with them. However, the average summer weekends and average summer weekdays should not be appreciably worse than current weekday peak hours (after Cliff Road upgrading is complete).

D. Surrounding Area Evaluation.

1. Background.

The development and use of the Zoo Area Development Guide will not only reinforce the strong prior planning efforts that have led to the Zoological Garden at this location, but will provide an added tool specifically focused on controlling any potential adverse environmental effects in the area surrounding the zoo.

The primary background materials for the Zoo Area Development Guide are the Comprehensive Plans of the Cities of Eagan and Apple Valley with some minor modifications.

Eagan adopted a Land Use Development Guide and Park Development Guide in February 1975. The Land Use Map included in this statement is the same as that adopted by Eagan.

Eagan and Apple Valley Planning Commissions have submitted the Zoo Area Development Guide for review by the Metropolitan Council.

Apple Valley adopted their Comprehensive PLan in January 1974. This plan was prepared in 1972 and 1973 and did not anticipate the boundaries of the Metro Open Space Areas. Therefore, certain minor changes from the Apple Valley Comprehensive Plan are reflected in the Zoo Area Development Guide. The changes have been reviewed by the Apple Valley Planning Commission. The Apple Valley City Council adopted a resolution to accept the Zoo Area Development Guide on November 10, 1976.

2. Proposed Land Uses.

The proposed uses for the surrounding areas are outlined in detail in the Zoo Area Development Guide. Figure 17 following illustrates the proposed land use guide for the area.

FIGURE 17

land use guide

APRIL 5, 1975

LEGEND

sf	SINGLE FAMILY DETACHED
low	LOW DENSITY RESIDENTIAL (3-6)
med	MEDIUM DENSITY RESIDENTIAL (6-12)
h	HIGH DENSITY RESIDENTIAL (12+)
lb	LIMITED BUSINESS
nb	NEIGHBORHOOD BUSINESS
vc	VILLAGE CENTER
gb	GENERAL BUSINESS
rb	ROADSIDE BUSINESS OR VISITORS
csc	COMMUNITY SHOPPING CENTER
rsc	REGIONAL SHOPPING CENTER
i	INSTITUTIONAL
p	MUNICIPAL OPEN SPACE
metro open space	METRO OPEN SPACE

1000' 500' 0 1000' 2000' 3000' 4000'

The following material summarizes contents of that Guide and revises some parts to relate it to this Statement. It is provided to assist in evaluating potential environmental impacts of the zoo project.

a) Agricultural Use - There is no long-range agricultural activity proposed for the zoo peripheral area in the Development Guide. This area, generally, is not suited to cultivation because of the rolling, wooded character of the area. In addition, much of the area is either developed with residential use, acquired for permanent open space, or served by public utility trunk service and bearing a corresponding assessment. As such, very little is either topographically or economically suited to agricultural use and this use is expected to completely diminish during the next few years.

b) Residential Use - The Zoo Area Development Guide proposes residential use over most of the zoo peripheral area. The Guide designates proposed land use intensity for residential area by giving an anticipated gross density range to each parcel. The designation of a density range relates to the physical character of the parcel as well as other factors normally considered such as adjacent uses, thoroughfare capacity, open space, and similar factors.

In most areas, low, medium, or high density designations are expected to result in a mixture of housing types primarily influenced by marketability and suitability of the terrain to accommodate a certain type of dwelling unit.

c) Industrial Use - The only industrial uses anticipated in the zoo peripheral area lie along the 140th Street corridor in Apple Valley. This area is rich in sand and gravel deposits and as such will be mined over the next several years.

d) Commercial Uses - The proposed commercial uses pose the greatest potential for conflict with zoo design, traffic needs, and adjacent residential development. As a result, the Zoo Area Development Guide deals with this use in some detail.

The potential and type of zoo-generated commercial uses has never been clearly defined. It is anticipated that the Zoological Garden could attract carnival-type commercial uses to the peripheral area which would simply feed on the volume of traffic and nature of the trip attracted by the zoo. This also is potentially true for quick stop restaurants, hot dog stands, or similar commercial uses. However, visits to other zoo sites by representatives of Apple Valley indicates little direct stimulation of such uses by a major zoo (see Appendix 16).

The indiscriminate development of these commercial uses is to be avoided. Food service is necessary, however, it is to be provided within the

Zoological Garden at numerous locations and this matter has carefully been considered by the Zoological Board. In addition, food service may also be provided by sit-down type dinner restaurants at certain commercial locations zoned for this use in Eagan and Apple Valley as described below.

The overbearing concern related to commercial development is to avoid the development of strip commercial uses along the routes leading to the Zoological Garden and to avoid development of carnival type uses which also would detract from the character anticipated for the Zoological Garden and peripheral area.

Commercial developments in the zoo peripheral area are expected as follows:

35E, Cliff Road, Cedar Avenue Triangle:

This triangle area, located in Eagan, currently has about 150 acres zoned in various commercial categories. The area is expected to develop with motels, restaurants, service stations, and community and neighborhood scale shopping centers. It is expected to be a primary service area for the zoo visitor because of the proximity to three major zoo traffic corridors.

The Guide does not anticipate additional commercial zoning in the area, at least for the next several years, because of the large amount of vacant, commercially zoned land. At any time, additional commercial zoning should always be proceeded by a revision of the Eagan Land Use Guide directing same. The primary concerns are that additional commercial zoning in the area, at this time, would be speculative or amount to over-zoning, and as such could lead to uncoordinated developments.

Unisource, Inc., which controls most of the zoned commercial property in the area, has an approved "Planned Development" with the City of Eagan. This Planned Development will give definitive direction to the development of the area and is by far the most desirable method of developing any property of a large scale. The two other large tract commercial land owners in the area (M.J. Astleford and Hillcrest Development) should also be encouraged to follow this procedure as well as following the commercial development standards and criteria contained herein.

Eaton Ranch/Cedar Knolls Area:

Two significant commercial zones exist along Cedar Avenue in Apple Valley. The Eaton Ranch area located south of existing County Road 38 was zoned Neighborhood Commercial about 1956. Since that time, the area has been designated as a Village Center under Apple Valley's "New Town" concept and a "Planned Development" has been prepared for the area.

The Eaton Ranch area is expected to develop with commercial uses oriented to the surrounding area rather than to commuter or zoo visitor traffic

along Cedar Avenue. The developer, in fact, has agreed to give up direct access to Cedar Avenue when it is upgraded.

The Cedar Knolls area which includes a large mobile home park, apartments, townhouses, and a vacant commercial area was planned about 1968. Development is substantially completed except for the twenty (20) acre commercial area. The commercial area has rolling wooded terrain; therefore, the shopping center zoning is inconsistent with the character of the land.

The Guide and the Apple Valley Comprehensive Plan designate this commercial zone for residential use except for the development of a small neighborhood convenience center. The developer has resisted this change and the inconsistency between zoning and the Apple Valley Comprehensive Plan is unresolved.

Zoo Gate Commercial Area:

The 80 acre Zoo Gate Development, sometimes referred to as the Winkler property, was zoned "Visitor's Business District" under a Planned Development Agreement by Apple Valley in 1974. Unlike the Greenleaf Village Center which is adjacent to the west, this development, to be located at the main entrance to the Zoological Garden, is expected to develop with zoo-related commercial uses. The zoo-related commercial uses, however, are restricted to motel, restaurant, service station, and car wash, primarily under the Apple Valley Zoning Ordinance and Planned Development Agreement related to this property. This gives assurances that some of the before-mentioned carnival type uses could not develop at this location.

The Zoo Gate Planned Development also provides potential for industrial uses such as an open amphitheater for the performing arts, which might be a joint development with the Minnesota Zoological Garden on this site related to the zoo. It also provides for a buffer area between the zoo access road and adjoining residents to the south. The details under which this development will occur are outlined in the Planned Development Agreement on file at the Apple Valley City Hall.

Internal Zoological Garden Commercial:

Certain commercial services are expected to develop within the Zoological Garden; i.e. food service at several locations, hostel lodging, and people movers. In the future an elaborate sit-down dinner restaurant may also be provided.

The internal commercial development will be controlled by a Planned Development Agreement between the Zoological Board and Apple Valley.

Other Commercial Developments:

Some small neighborhood convenience centers, not previously identified, are expected to develop over the next several years as residential development ensues. These centers would be to provide the daily needs of adjoining residents. The Guide has not attempted to project future locations of the small centers in the zoo peripheral area.

In addition, it is expected that rezoning and other requests for zoo-related commercial or other commercial developments will be raised from time to time. In particular, overtures already have been raised in some areas adjacent to the border of the Zoological Garden.

Such a development is not necessarily precluded by the Guide, because it is not an inflexible document and does provide for revision.

Commercial Summary:

The key to avoiding significant environmental effects from commercial development in the surrounding area will be the control of development provided in the Zoo Area Development Guide and the careful development of planned development agreements. With an effective Zoo Area Development Guide, there will be no substantial environmental effect.

3. Transportation.

The Transportation Plan map, attached hereto as Exhibit 13, and included in the Zoo Area Development Guide is primarily based upon the Eagan Land Use Guide, Apple Valley Comprehensive Plan, and the Dakota County Thoroughfare Plan.

a) Background - For several years, the communities (Eagan and Apple Valley), Minnesota Zoological Board, Minnesota Highway Department, and Dakota County have been preparing Transportation Plans for this area which would provide service for the zoo visitor.

These plans have resulted in two legislative proposals. First, in 1973 the Minnesota State Legislature passed a bill directing the Minnesota State Highway Department to construct a Zoo Access Road south from the future Interstate 35E/Cedar Avenue (State Highway 36) interchange to the zoo entrance. Plans formulated to date provide that the segment of this zoo road between Galaxie Avenue and Johnny Cake Road will be completed by the opening of the Zoological Garden in May, 1978. The remaining segment, from the Interstate 35E interchange to Galaxie, would be completed about 1981.

Secondly, a 1975 bill proposed that Johnny Cake Road would be surfaced (52' wide with curb and gutter) with Minnesota State funds from Cliff Road south to a point one quarter mile south of the Zoological Garden. South of this point, Apple Valley will surface Johnny Cake Ridge Road to County Road 42. This would provide an approximate four-mile paved road-

way along the east perimeter of the Zoological Garden. All of Johnny Cake Ridge Road has been graded. The road has been widened and resurfaced to four lanes from Cliff Road south to Zoo Gate #2. Work is continuing on the remainder of the road with completion scheduled for summer of 1977.

Dakota County plans include upgrading a portion of Cliff Road (County Road 32). The extension of that improvement and the coordination with zoo opening are important.

This interim plan is not ideal, but it can provide paved roadways around the Zoological Garden by the expected opening in May, 1978.

b) Zoo Access Roads - The ultimate Transportation Plan for thoroughfares in the zoo peripheral area and for access to the Zoological Garden is best described by the "Functional Classification of Highways" in the zoo area, as contained in the Zoo Area Development Guide and the corresponding Transportation Plan Map. The Functional Classification outline shows the status, construction schedule, function and type facility each thoroughfare in the area is expected to be, except for local residential collector streets or local access streets. Local community thoroughfare plans provide this detail.

If this plan was followed the traffic impact from the Zoological Garden project upon the surrounding social/residential environment would be substantially reduced. There should be no substantial environmental effect if the roadways that are the basic parts of the plan are improved as provided.

4. Trails

Trails of pedestrian ways planned for the zoo peripheral area and illustrated on the Transportation Plan Map are also illustrated in the Eagan Park Development Guide and the Apple Valley Trail Plan. The latter has not been officially adopted.

Detailed plans are being prepared for trails in the Dakota County parks (Metro Open Space) areas shown on the Transportation Map. They are not yet officially adopted.

No action will be taken until public hearings have been held. Action will require approval of the Dakota County Board of Commissioners. The County Parks Department is adaptable to any type of hook-up between the trail system and the zoo site. The proposed trails (located at the northern perimeter of the zoo site) would be variable depending on terrain and the woodlot. They would consist of no more than wood chip paths for hiking trails.

The trail systems will link surrounding areas to the zoo entrance. The zoo has also agreed in the Planned Development Agreement for rezoning to assist in linking these trail systems outside the zoo.

5. Transit

The Zoo Area Development Guide proposes the preservation of right-of-way along three corridors in the area for future mixed traffic express transit service to serve residents in the area and the Zoological Garden. The corridors are I-35E and Cedar Avenue (State Highway 36) both of which are shown in the Metro Area Development Guide.

In addition, right-of-way preservation is proposed along the Cliff Road corridor because of the added emphasis the corridor has recently attained in the Metro Council's review of arterials in this area and the emphasis in the Dakota County Thoroughfare Plan.

Transit right-of-way preservation is not proposed east of Cedar Avenue along the zoo access road. This is only a distance of about one mile and there is no indicate of clear need for right-of-way over this short distance only to serve the zoo.

Transit planning is continuing with the Metropolitan Transit Commission. Effective transit can reduce the traffic impact of the zoo project.

6. Specific Development Guidelines and Standards

Specific guidelines and standards will be used for development in the area, and will be confirmed in the Zoo Area Development Guide. It will provide a further control to avoid adverse development impacts.

The Zoo Area Development Guide notes that there is a need to adopt general guidelines and standards to insure that the numerous concerns related to the development in the zoo peripheral area will be weighed against written requirements as set down herein. The asthetic attributes of the area -- historical, scenic and cultural -- shall be considered not only in public areas but with private developments as well. Development proposals shall be tested in each instance for their contribution to the agreed-upon goals for the development of the zoo peripheral area. Regional concerns, rather than just local or private concerns, shall be given proper attention during this process.

Both general and specific guidelines in some instances will govern the review and action related to all developments in the zoo peripheral area. The specific involvement by each agency in the review process is detailed in the procedures section of the Zoo Area Development Guide. The areas of concern covered by the Guide are as follows: planned development,

architecture, including approval of plans, miscellaneous site improvements, design styles, materials, colors, mechanical protrusions, and compatibility, driveway surface and color, transmission and receiving antennas, utility installation, service areas, outdoor storage, signs, landscape design, streetscape, height, scenic views, mining and extraction, curb-cuts, public park and trail dedication, unsewered development, vegetation management, and grading and fill.

7. Surrounding Land Use Summary

The effective use of the Zoo Area Development Guide will avoid any significant environmental effect resulting from the Minnesota Zoological Garden project.

SECTION 4

conclusion

It is clear that the proposed action, including the development of the Zoological Garden and the related access roadways, is a major governmental action.

However, the proposed action is based upon extensive research and planning. Site location has been confirmed in a variety of local and metropolitan planning documents, and proposed development has been reviewed for environmental effects prior to this Statement. The potential for significant environmental effects has been substantially reduced by the use of clear objectives and guidelines by the Minnesota Zoological Board, and the careful design and review process followed in initial stages of this project.

The major potential adverse impacts would come from failure to provide adequate access roads or from overdevelopment of the surrounding area. The joint planning efforts by the Minnesota Zoological Garden, the Minnesota Highway Department, Metropolitan Council, Environmental Quality Council, Apple Valley, and Eagan has resulted in a careful review of roadway alternatives and a Zoo Area Development Guide. In addition, Dakota County is acquiring park land around the site. These efforts offer greater control over potential impacts than is generally found in any project. If these procedures are followed there will be no significant adverse environmental effects.

Rather, the net result of the zoo development will be a significant improvement of quality of life for the metropolitan area because of the educational, recreational, and conservation opportunities. The environmental planning approaches followed in the design and construction of the Minnesota Zoological Garden will recreate a large, substantially natural park or garden effect with the focus on animals in natural settings.

The result of the proposed action will be a significant net benefit to the surrounding communities, metropolitan area, and State of Minnesota.

References:

The following listed materials have significant relationships to the Minnesota Zoological Garden project. However, because of the volume of such material and because relevant portions have in most cases been summarized in the environmental assessment, they are not included as part of the assessment. Anyone wishing to review such material may do so by contacting the offices of the Minnesota Zoological Garden.

1. Metropolitan Development Guide - State Zoological Park (Dated November 13, 1969)

2. Site Evaluation Report, Anoka Site (InterDesign, Inc., 1970)

3. Site Evaluation Report, Bailey Site (InterDesign, Inc., 1970)

4. Site Evaluation Report, Jordan Site (InterDesign, Inc., 1970)

5. Site Evaluation Report, Lebanon Hills Site (InterDesign, Inc., 1970)

6. U.S. Department of Agriculture letter regarding Proposed Approved Site (May 18, 1970)

7. Site Recommendation by Professional Staff, Minnesota Zoological Garden (May 22, 1970)

8. Report by Site Selection Committee, Minnesota Zoological Garden (May 22, 1970)

9. Metropolitan Council letter (June 29, 1970) with attached Resolution of Site Approval and committee and staff reports

10. Minnesota Zoological Garden letter (December 22, 1970) with attached report to the Metropolitan Council on a Master Plan

11. Metropolitan Council Resolution of Site Development Approval (February 11, 1971) with attached committee and staff reports

12. Minnesota Zoological Garden, Master Plan (1971)

13. Minnesota Zoological Garden, Implementation Plan (1973)

14. Service and Facilities Program by ZooTeam, Inc. (1973)

15. Financial Feasibility Study by Stanford Research Institute (SRI) (1970)

16. Update Analysis of the Minnesota Zoological Garden by Real Estate Research Corporation (1974)

17. Soils Investigation for the Minnesota Zoological Garden by Hickok and Associates (1970)

18. Preliminary Soil Investigation by Soil Exploration Company (1974)

19. Soil Investigation - Proposed Utilities, Roadways and Walkways by Soil Exploration Company (1974)

20. Phase II Soil Investigation by Soil Exploration Company (1974)

21. Comprehensive Guide Plan for Apple Valley (1972)

22. Zoos in Other Cities by Representatives of the City of Apple Valley (June 17, 1974)

23. Three-Mile Land Use Survey Report by Charles Wilson (August 20, 1974)

24. Energy Report by ZooTeam, Inc. (1974)

25. Proposal for an Environmental Assessment by Donald D. Bridgwater (February 9, 1974)

26. Minnesota Zoological Garden Zoo Road: Landscaping Design Concepts; Noise Analysis; and Air Quality prepared by the Minnesota Department of Transportation - District 9, Oakdale, Office of Environmental Services.

27. 1970 U.S. Bureau of the Census, Housing and Population Characteristics.

28. Economic Projection Update - Final Report by Midwest Research Institute (July 23, 1976).

SECTION 5

comments received on the draft environmental impact statement and public hearing

INTRODUCTION

This section contains reproductions of the comments received on the Draft Environmental Impact Statement. Substantive comments have been assigned letter designations which also appear in the subsequent discussions of their disposition.

The summary and disposition of the substantive socio-economic, environmental and other comments made at the November 10, 1975 public hearing appear at the end of this section.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Federal Building, Fort Snelling
Twin Cities, Minnesota 55111

IN REPLY REFER TO:
ES-EIR

DEC 15 1975

Mr. Gerard D. Hegstrom, Project Director
Minnesota Zoological Garden Project
Room 102, Wentworth Office Center
33 East Wentworth Avenue
West St. Paul, Minnesota 55118

Dear Mr. Hegstrom:

This responds to your October 8 request for this Service's review and comment on the draft environmental impact statement (EIS), authorized under the State Environmental Policy Act of 1973, for the Minnesota Zoological Garden in Apple Valley, Dakota County, Minnesota. We have reviewed the draft EIS in our area of expertise and jurisdiction and have the following comments.

A The draft statement does not adequately describe certain aspects of the proposal, including the highway access and the probable impacts on the environment. However, we were pleased to note that many of the native animals would not be displaced from the area. Those that are to be displaced (see page 49), principally deer, fox, raccoon, weasels, hawks and owls would be trapped and released elsewhere. The EIS should mention that this action will be coordinated with the Minnesota Department of Natural Resources. Since these animals are protected by law we suggest that this trapping and release proposal be fully coordinated with that Department and that it be noted in the EIS.

B The statement also is deficient in its provision for the exhibition and breeding of threatened or endangered species. The statement should indicate that a Federal permit, issued by the U.S. Fish and Wildlife Service, or one issued by a foreign government, is necessary for the exhibition and/or breeding of species listed in Appendices 1, 2 and 3 of the Convention of International Trade in Endangered Species of Wild Fauna and Flora.

C The statement describes three roadway access alternatives to the zoo site. The need for adequate roadway access is obvious when preliminary traffic estimates indicate a peak day use of 8,000 to 9,000 cars. We suggest that Alternate A be given full consideration as the zoo access route for the following reasons:

1. The use of existing Cedar Avenue (to be improved by 1979) will not require building new right-of-ways or extensions

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

as proposed by Alternates B and C and therefore would have the least environmental impact of the three alternatives considered.

2. Alternates B and C would require new roadways applicable only for the zoo and would pass through Section 4(f) lands. Alternates B and C also would have considerable primary and secondary adverse impacts upon a large, nearly mature, oak woods located on the northern edge of the proposed area.

3. A mass transit option is being considered as an addition to the proposed improvements for Trunk Highway 36 (Cedar Avenue) in Dakota and Hennepin Counties. With the exception of Interstate 35E, no other nearby highways would have this capability.

D The statement indicates that there are no rivers or streams in the project area, and that surface water presently drains into many scattered, small lakes and wetlands. The control of soil erosion during the construction phase and life of the project is essential to maintain the existing high quality of these water resources, as well as rivers and streams. Therefore, a description of soil erosion control should be included.

E The most significant adverse environmental impact of Alternate A probably would be the stimulation of commercial development along the zoo access road and the Cedar Avenue-Interstate 35E junction. The statement provides a Zoo Area Development Guide (page 58) to assist local communities in properly guiding development of the area. The large tract of relatively undisturbed oak woodlands would be adversely affected by the secondary development. The Guide recommends that the area be zoned as single family (sf), roadside business (rb). We suggest that this area be zoned as open space to serve as a natural noise and disturbance buffer between the zoo and a large, single family housing development to the south. The communities of Eagan and Apple Valley should be encouraged to modify their comprehensive plans to reflect this land use.

F The statement indicates that the project area contains scattered stands of native grass such as big bluestem. Since the "new zoo" concept lends itself to education and conservation, the management of some of the native grasses should be encouraged and described in the EIS. This group of prairie grasses was once an important part of

Dakota County's natural environment which harbored elk, buffalo, prairie dogs and other prairie species. Advice regarding the management of native prairie environment could be obtained from the Hennepin County Park Reserve District and the Minnesota Department of Natural Resources.

Sincerely yours,

Charles A. Hufnagel

Acting Regional Director

RESPONSE TO UNITED STATES DEPARTMENT OF INTERIOR FISH AND WILDLIFE SERVICE

A — We concur with the statements made by the United States Department of Interior. Similar statements regarding the trapping of native animals are reflected in the Final Environmental Impact Statement on pages 35, 51 and 52.

B — Permit compliance is noted in the Final Environmental Impact Statement on page ix.

C — We concur with the statements made by the United States Department of Interior. Similar statements are reflected in the Final Environmental Impact Statement supporting the selection of Alternate A.

D — Water resource impacts from sedimentation and soil erosion control measures are discussed on revised pages 58, 59 and 60.

E — The concern over proper zoning to insure a natural noise and disturbance buffer is a valid concern and should be directed to the communities of Apple Valley and Eagan for any modification in the Zoo Area Development Guide.

F — Native prairie grasses will be used extensively in interpretive programs and in a prairie grass exhibit planned for the roof of the education building.

ADMIN 1000

STATE OF MINNESOTA

DEPARTMENT HEALTH

Office Memorandum

TO : Warren R. Lawson, M.D.
Commissioner of Health

DATE: December 4, 1975

FROM : Charles F. Settle
EQC Technical Representative

PHONE:

SUBJECT: Minnesota Zoological Garden Draft
Environmental Impact Statement

The proposed Minnesota Zoological Garden will consist of structures, fences, exhibit areas, landscaping, internal roadways and utility systems, and the project will be located one half mile east of the intersection of Cedar Avenue (C.S.A.H. 23) and the Eagan-Apple Valley city limits in Dakota County.

The project will be connected to municipal sewer and plans and specifications for the water supply have been received for review by this Department. Since the projects health aspects have been adequately addressed we have no questions to be addressed in the Final EIS.

cc: Technical Representatives (10)

RESPONSE TO MINNESOTA DEPARTMENT OF HEALTH

No response to comments is necessary.

MINNESOTA HISTORICAL SOCIETY

690 Cedar Street, St. Paul, Minnesota 55101 • 612-296-2747

21 November 1975

Minnesota Zoological Garden Project
c/o Gerard D. Hegstrom, Project Director
Room 102, Wentworth Office Center
33 East Wentworth Avenue
West St. Paul, Minnesota 55118

Dear Mr. Hegstrom:

As Environmental Assessment Officer of the Minnesota Historical Society I am in receipt of the Draft Environmental Impact Statement for the Minnesota Zoological Garden. After review of that statement and after consultation with both the Archaeology and the Survey and Planning sections of the Society several comments are in order.

A | On page 27 of the statement it is stated that the Minnesota Historical Society has examined the zoo area for historical sites or landmarks. "None have been identified," you state, "in the area directly affected by this project." The Society disagrees with this statement. Not only has no survey been done of the project area, but it is also the belief of the Society that the area in question, because of its potential for archaeological sites, should be surveyed before construction continues. The only input by Society staff was made by Mr. Jerry Oothoudt of the Archaeology staff when he stopped at the Garden November 7, 1974. Mr. Oothoudt did not make a survey at that time. Rather he was there long enough to note only that construction was well under way.

B | On page 28 of the Draft Statement it is stated that proposed highway corridors have been examined and found to contain no historic data. We do not believe this to be accurate. Rather the Highway Archaeologist of the Society consulted with the Minnesota Highway Department District 9 office to ascertain proposed alternate corridors for the access roads. Since the proposed alignments for highway corridors were considered tentative, and the terrain was seen to be difficult to survey, the Highway Archaeologist informed the Highway Department that the surveys of the corridors would have to be made and would be made when a field crew became available in 1976.

Therefore, we believe that the Draft Statement does not correctly state the Society's position. The Society does not believe that there are no historic sites or landmarks within the area; instead it believes that the area, because of its potential for historic sites, must be surveyed to establish whether such sites in fact exist.

Sincerely,

Charles W. Skrief
Environmental Assessment Officer

CWS/fr
cc: Richard Luhrsen; District #9; Department of Highways; 3485 North Hadley Ave.; North St. Paul, Minnesota 55109

RESPONSE TO MINNESOTA HISTORICAL SOCIETY

A We anticipate that the Historical Society will complete surveys on the zoo access road by the summer of 1977.

B A preliminary site tour was made by the archaeologist of the Minnesota Historical Society. It was determined that a site survey would be conducted during the summer of 1977 as noted on page 30 of the Final Environmental Impact Statement

STATE OF MINNESOTA

DEPARTMENT ENVIRONMENTAL QUALITY COUNCIL

Office Memorandum

TO : Zoo Board

DATE: 12/30/75

FROM : Yung-Kang Joseau
EQC Staff

PHONE:

SUBJECT: COMMENTS ON THE DRAFT ZOO EIS

In November 1974, the EQC passed a resolution which stated that the environmental assessment on the Zoological Garden will suffice as an EIS if additional information pertaining to the commercial development of the Zoological Garden periphery, and pertaining to the zoo access road, is included in the assessment. Therefore, our review of the draft EIS is concentrated on these two additional information items.

A. Zoo Access Road

A

1. Impact on existing drainage pattern.

The draft EIS, pg. 53, states that "localized drainage patterns in the vicinity of the chosen route alternatives A, B, or C, would be changed somewhat..."

What kinds of localized drainage patterns are to be changed? What will be the impact on the existing drainage patterns? What mitigative measures are being proposed by the Highway Department?

B

2. Impact on the steep slopes.

The draft EIS, pg. 40, stated that "one-third of the study area has slopes of 18% or more, and these slopes can be as great as 40%. The other two-thirds of the area is rolling terrain, generally beginning with a minimum 6% grade."

Because the slope at the Zoo peripheral area is such a dominant factor, erosion and sedimentation could be very serious problems. The EIS should discuss fully the control measures to be taken to minimize erosion and sedimentation impacts. A statement should be made as to the degree of efficiency to be achieved by the various control measures to minimize erosion of slopes and sediment yields.

Another concern regarding steep slopes is about their aesthetic quality. Unfortunately, the draft EIS makes no mention of how this quality of the steep slopes is going to be preserved.

C

3. Impact on the residential neighborhood.

In the draft EIS, there are no traffic volumes, air, noise or pollution projections. Therefore, the description of the impact of the road on the neighborhood is found inadequate.

D

4. Visual Impacts.

As we understand it, the Zoo Access Road is planned to have a parkway atmosphere. But there is little mention of how the parkway atmosphere will be accomplished. A concept landscape plan to indicate the locations, and types of vegetation to be planted should be considered for inclusion in the final EIS.

B. Zoo Area Development Guide

E

1. The western boundary of the Zoo study area is vague. Consequently, the unclear boundary definition will cause difficulty in enforcing the regulations which are specifically applied to this study area. The Zoo study area boundary should be clearly defined in the final EIS.

F

2. The Guide Plan, pg. 13, states that "any land developed with 18% slope or more would be so difficult to develop that it would be much better to maintain these areas as permanent open space and establish them for erosion and sedimentation control." It appears that the intention of this paragraph is to protect the land with 18% slopes or more. But in the Protection Open Space section, the steep slope category was not included. We, therefore, suggest that land with 18% slopes or more be added to the Section H -- Protection Open Space.

G

3. The local units of government should develop regulations and acquisition programs to protect the Protection Open Space.

H

4. The local unit of government should develop regulations for land reclamation and reforestation of the mining site.

I

5. The zoning map does not coincide with the land use map. For example, one parcel of land, west of the Zoo, is zoned institutional; whereas, it is designated as low and medium density and park on the Land Use Map.

We suggest that the Zoning Map and Land Use Map should be the same.

/pj

RESPONSE TO MINNESOTA STATE PLANNING AGENCY

A

Alteration of localized drainage patterns will result from the roadway construction.

Discussion of water resource impacts and mitigative measures to lessen effect are included on revised pages 59 and 60.

B

The impacts to steep slopes from construction of Selected Alternate A are discussed on revised pages 59 and 60. In general, in suburban and rural areas 33-1/3 slopes or less are constructed to reduce erosion and improve aesthetic appearance.

The Minnesota Zoological Garden concurs with the Environmental Quality Council's recommendations regarding the protection of slopes. Protection measures are outlined on pages 50 and 51 of the Final Environmental Impact Statement.

C

Projected traffic volumes are discussed on revised pages 60 and 61. Descriptions of air and noise effects can be found on revised pages 56, 57 and 58.

Roadway construction may induce social impacts to neighboring communities. Relocation, access and effects to community services are discussed on revised pages 54 and 55.

D

Visual impacts and landscaping design concepts are discussed on revised pages 61, 62 and 63.

E-I

Since the Zoo Area Development Guide is a separate document developed and adopted by the communities of Apple Valley and Eagan, the comments concerning the Guide directed by the Environmental Quality Council will not be addressed in this Final Environmental Impact Statement.

METROPOLITAN COUNCIL
Suite 300, Metro Square Building, Saint Paul, Minnesota 55101

MEMORANDUM

November 25, 1975
Revised: December 30, 1975

TO: Environmental and Transportation Committee

FROM: C. Kozlak and T. Bell

SUBJECT: Referral #3102, Draft EIS for Minnesota Zoological Garden

I. Introduction and Project Description

On October 8, 1975, the Minnesota Zoological Garden submitted to the Metropolitan Council for review and comment a draft environmental impact statement for the zoo, including the zoo access roads. The proposed action is the development, operation and use of a major public zoological garden facility for the purpose of providing recreation, education and conservation, and the development and use of related access roads.

The site for the Minnesota Zoological Garden is in Apple Valley, Dakota County. The north boundary of the zoo is also the north boundary of the community. The west and east boundaries are generally along the Apple Valley municipal roads referred to as Galaxie and Johnny Cake Ridge Road. The major external access road is an extension of Minnesota Trunk Highway 36 from the intersection with Interstate 35E south and east around the site to the southwest corner entry to the zoo.

This EIS is divided into four sections. The first section describes the proposed action, including the zoo project, alternatives to it, the zoo access roads, and alternative routes. The second section describes the environmental setting. Section three analyzes the probable environmental impacts and mitigation of adverse effects, and section four is the conclusion.

II. Authority to Review

This Statement has been prepared and is being circulated in compliance with the State Environmental Policy Act of 1973, Minnesota Statutes, Section 116D.01 et. seq. The Minnesota Zoological Board will accept written questions and comments for inclusion and reply in the final Environmental Impact Statement until January 8, 1976. The Council's comments on an EIS relate only to the adequacy of the statement. As such, Council review at this time does not constitute approval or endorsement of either the zoo site plan or the zoo development guide, which are being reviewed separataly.

III. Background

The Metropolitan Council has been involved in the development of a major zoological garden since the late 1960's. Early action on the Council's part included a zoo advisory committee and recommendations to the Legislature that a state zoo should be developed. The 1969 legislature approved the concept of a zoo and created the eleven member, Governor-appointed Minnesota Zoological Board. The Board, after considering several alternative sites, chose the Apple Valley site, and, pursuant to state legislation, submitted this site to the Council for approval. On February 11, 1971, the Council approved the concept plan, but reserved final action on site development. After initial staff review pointed this out, a letter was received from the Zoo Board's Director (December 11, 1975) petitioning the Council to use the Draft Environmental Impact Statement as the site development plan for Council review purposes. The Council will review the site development plan as a separate referral under the sixty-day review period provided by statute, assuming this letter represents an official request by the Zoo Board.

During 1973 the Governmental and Technical Coordinating Committee for the Minnesota Zoological Garden, which included Metropolitan Council staff members, discussed road access, transit and surrounding land use. Nothing concrete was resolved until 1974 when state enabling legislation to provide a zoo access road was passed. In addition, in November, 1974, the Minnesota Environmental Quality Council found the zoo environmental assessment inadequate and called for completion of an Environmental Impact Statement on the surrounding area as well as the zoo itself.

Following these two actions an interagency committee was formed, supported by resolutions of Apple Valley, Eagan and the EQC. Representatives from these three bodies and the Zoo Board, MHD, Dakota County and the Metropolitan Council met frequently during 1975 to deal with issues of adequate and timely road access and peripheral zoo area development. Through these cooperative efforts agreement was reached to incorporate roads and surrounding land use into the EIS. A Zoo Area Development Guide was prepared by this committee, and a public hearing was held on this Guide in September, 1975 by Apple Valley and Eagan.

It was adopted by the planning commissions of Eagan and Apple Valley in December . This Guide is referenced in the EIS, and Eagan and Apple Valley have submitted it for Council review. The Council received these referrals in mid-December and will follow the ninety-day plan review procedure provided for comprehensive plan amendments in the Council law.

This EIS was prepared by the Minnesota Zoological Board and the Minnesota Highway Department with input from the interagency committee.

IV. Discussion of Issues

A. Development Framework

In general, the zoo poses no conflict with Development Framework policies given its location within the 1975 Urban Service Area. However, there are several specific issues in the EIS which should be clarified.

A The statement is made on page xi that the zoo site development plan has been approved by the Metropolitan Council. This is incorrect. The State Zoological Board is required by law (MSA 85A.02, Subd. 2) to submit its zoo site master plan to the Council for a finding on its consistency or inconsistency with the MDG. On February 11, 1971, the Council approved the concept portion of the comprehensive plan for the zoo site development. As is discussed under "Background" and as the attached resolution (Resolution 71-4) indicates, this did not constitute approval of the site plan. The EIS should indicate the correct status of the site development plan, and that the site plan is currently being reviewed by the Council as required by law.

B The status of the Zoo Area Development Guide is also not clearly defined. While it is true that Council staff has provided advice on the preparation of this peripheral area plan, this plan itself must be incorporated as part of the affected municipalities' comprehensive plan before it can be officially reviewed by the Council. As the Council reviews the local comprehensive plan amendments for Eagan and Apple Valley, it will also raise the question of the current status of their overall comprehensive development plans. Before endorsing a sub-area plan such as the Zoo Development Guide, the Council will want assurance that planning for the entire area of both cities is up to date, adequate, and consistent with current Council plans and policy and that past referral recommendations have been followed. These comments relating to the status of the comprehensive plans may be appropriately noted on page xi and page 57 of the EIS. The EIS should indicate that Eagan and Apple Valley planning commissions have submitted the Zoo Area Development Guide and that they are being reviewed by the Council as comprehensive plan amendments.

C In addition, the Zoo Area Development Guide outlines a rather complex set of permit procedures which involve the Metropolitan Council in reviewing variances from the Guide. The Council has not yet reviewed or agreed to these procedures.

Initial staff review of the Guide indicates that there are some inadequacies, especially in the following areas:

1. The regulatory devices, procedure and agreements by which the Guide will be implemented have not been clearly discussed;

2. While the guide addresses some types of development which are to be avoided in the zoo area, it should be clarified and expanded to include a clear set of standards and guidelines against which development proposals can be evaluated;

3. The procedure for reviewing development in the zoo area, and the roles of the Metropolitan Council, Environmental Quality Council and local governments in reviewing proposals should be given additional study.

As indicated previously, the Guide will be more thoroughly reviewed by the Council within 90 days.

The EIS is also inadequate in that it deals with the surrounding land use only by reference to this unadopted Guide. Before completion of the final EIS the Zoo Area Development Guide should be approved by all appropriate bodies as a binding document. If this is not possible, an additional analysis of the impact of the zoo on the surrounding area should be included in the final EIS.

B. Transportation

The major transportation concerns for the Zoo are the present lack of a permanent access road and the need for interim access. The alternatives for the Zoo access road are discussed in this EIS as are

D suggestions for interim solutions. However, more specific data on traffic projections, noise and air quality, transit proposals, and overflow parking arrangements are needed before a decision is made on which alignment is preferable. However, the alternative which runs through the Dakota County park does not appear viable.

MHD indicates that a detailed traffic study is being prepared for presentation at the Design Public Hearing which will be held within six months. As more information, such as traffic volumes, becomes available it should be incorporated into the final EIS. Since congestion and resulting pollution and nuisance problems will have an adverse effect, these legitimate concerns should be more thoroughly covered in the EIS.

E The east-west portion of the Zoo road is proposed as an at-grade, expressway with access at 5 locations (two of them zoo entrances). This number of accesses on a 1.5 mile road could cause safety problems and should be carefully considered in the design stage. Alternate "A" appears to be the best location, although a final decision should await more detailed data on noise and air quality. The "do-nothing" alternate is unacceptable given its social and environmental impacts, and the legislative mandate to construct a zoo access road. The proposed interim access appears to be temporarily adequate if it can be funded and accomplished by the opening of the zoo.

F On page 52 and elsewhere it is suggested that heavy truck traffic volumes are not expected. However, the zoo access road will be a section of C.R. 38, which is part of the total Dakota County System, and truck traffic is likely. This issue should be considered in forecasting traffic volumes for this road.

G As a viable transportation alternative in reducing the automobile traffic, transit should be discussed more definitively. The Final Report of the Northern Dakota County/Southern Washington County Route Ridership Improvement Project states: "The ten-year transit service improvement plan and implementation program includes. . . : Initiation of service to the Minnesota Zoological Gardens. Regular daily service will be provided from the Minneapolis and St. Paul Central Business Districts, proceeding limited stops throughout the Study Area to the Minnesota Zoological Gardens in Apple Valley." Since less than 1500 passengers a day could be carried on these two CBD-to-Zoo routes with hourly headways, this level of service will not appreciably reduce traffic or alleviate parking problems.

The Route Ridership Study also suggests several additional park/ride lots, which appear to be work-trip oriented. The one proposed to be near the Zoo would provide space for only 40 vehicles, which does not appear to be sufficient for Zoo overflow parking. Design considerations in Appendix 13 and public testimony suggest the possibility of park/ride shuttle service to the Zoo. However, this concept has not been thoroughly explored in the EIS, and it should be pursued further.

H Several other questions occur regarding parking facilities. The EIS states that the parking lot is designed to hold 2500 cars. With peak day attendance projected at 30,000, is this adequate? Some turn-over is expected and possibilities of overflow arrangements are suggested but seem to be tentative and inadequate. Parking on local residential streets could have severe impacts on the neighborhood.

C. Environmental

There do not appear to be any major environmental problems, but several points need to be clarified in the final EIS.

1. Surface Water Impacts. The problems of erosion and sedimentation during construction are pointed out. However, the only measure mentioned to minimize this impact is the sodding, planting, and seeding of soils on slopes. Although construction is underway, additional management measures should be taken to protect the small lakes or ponds on the Zoo site from sedimentation. For example, the portion of the site area exposed at any one time should be minimized, as well as the length of time during which the soil is exposed. Temporary seeding or mulching of disturbed areas should be applied. Temporary sediment basins, diversions, and similar structures should also be installed to minimize sedimentation problems. The land area under development should be of a size which can be completed in one construction season to minimize erosion impacts. Finally, all installed erosion and sediment control measures should be maintained after construction is completed until these measures are permanently stabilized.

I

J Natural runoff from non-exhibit areas is to be retained in ponding areas on the site. It is not clear whether this includes the nine small lakes or ponds on the site and if they are included, what the impacts on the water quality and zoo environment will be. Runoff from parking lots and other public areas could have a substantial impact on the water quality in these ponds, expecially after a number of years. The report does indicate that the lake levels may have to be maintained artificially for aesthetic purposes.

K The other potential surface water impacts of the Zoo and proposed access roads have been identified and measures to prevent or minimize these impacts are to be included in the project plans and development.

2. Groundwater Impacts

L

There appears to be some inconsistency within the EIS and between the EIS and other sources concerning the soil characteristics of the zoo site and the potential impact of runoff from animal exhibit areas on groundwater resources. The text of the draft EIS indicates that the soil characteristics of the site do not permit significant percolation of surface water runoff. In contrast to this information, the Dakota County Soil Survey and the zoo EIS data for lake bottom infiltration rates indicate that these soils do permit rapid percolation. Based on this data there should be some consideration for the protection of groundwater from potential pollution from animal exhibit areas.

Conversations with the Zoo Board staff indicate the reasons for the apparent conflicts in the EIS data and between the EIS and county soil survey. Additional soil tests and current zoo construction activities indicate the presence of a series of clay seals on the site which would retard or prevent the infiltration of surface runoff into the groundwater. This additional information should be presented in the final EIS to resolve the differences in soil data.

In response to the more recent and detailed soils data and the Zoo Board's concern for protection of the groundwater and other surface waters on the site, the EIS indicates that runoff from animal exhibits will be stored temporarily in separate ponding areas to protect the lakes on the site and later discharged into the public sanitary sewer system after the peak periods of storm water runoff have passed. The Zoo Board staff has also indicated that animal population density will be less than expected and this should reduce the potential for groundwater pollution. This additional data should be included in the final EIS. Some analysis also should be provided that the location, construction, and operation of the separate drainage system for the animal exhibit areas will be adequate to protect the groundwater from pollution.

M

3. Air Quality and Noise Impacts. The analysis of air quality and noise impacts is inadequate as discussed in the draft EIS. The draft EIS includes only a general discussion of the possible noise and air quality impacts of alternative Zoo access road alignments and potential measures to reduce these impacts. The long-range traffic forecasts for the Zoo area which are the basis of such an impact analysis were still being developed at the time the draft was being written and, therefore, could not be used. The traffic forecasts, a detailed impact analysis, and a discussion of measures to reduce any impacts, should be included in the final EIS. It is the intent of the State Highway Department to provide this detailed analysis as part of its plan. However, it should also be included in the final EIS.

N

4. Sanitary Sewer Service. Questions raised by staff concerning the provision of sanitary sewer service to the zoo have been clarified through submission of additional information. The zoo will be served through a local trunk line in the City of Eagan. Eagan's consulting engineers, Bonestroo, Rasene, Anderlik and Associates, Inc., have reported that capacity is sufficient for both the zoo and future development to be served by this facility. The consultants also note that the status of this facility as a local trunk line is not expected to change unless there is a change in the status of similar facilities in Service Area No. 5. It should be noted that under Procedure #4 of the Council's Waste Management Policy Plan dealing with Municipal Sewer Facility Acquisition, no local facility can be acquired that has not been included in the Council's Policy Plan and the Commission's Development Program and Capital Budget.

V. Summary of Findings and Conclusions

1. The status of the zoo site development plan is not correctly stated in this EIS. This site plan has not been given final approval by the Metropolitan Council as is stated in the EIS. It is currently under review according to statute as a separate referral.

2. The EIS addresses impacts on surrounding land use only by reference to the Zoo Area Development Guide, which has not yet been adopted by the affected bodies. This Guide is being reviewed by the Council as a separate referral from Eagan and Apple Valley under statutory procedures for review of local comprehensive plan amendments. Initial staff review has identified the following issues:

   A. The regulatory devices, procedure and agreements by which the Guide will be implemented have not been clearly discussed.

B. While the Guide addresses some types of development which are to be avoided in the zoo area, it should be clarified and expanded to include a clear set of standards and guidelines against which development proposals can be evaluated.

C. The procedure for reviewing development in the zoo area, and the roles of the Metropolitan Council, Environmental Quality Council and local governments in reviewing proposals should be given additional study.

3. The information on traffic volumes (including trucks), air and noise pollution, and access limitations to the Zoo road is inadequate.

4. The parking provisions do not appear to be adequate for the projected attendance.

5. The Zoo Board has cooperated with MTC and express routes are proposed hourly from each CBD to the Zoo. However, additional service may be required to alleviate parking problems (possibly special service such as shuttles from a remote parking site) and these options should be further explored.

Recommendations

1. That these comments and findings be transmitted to the Minnesota Zoological Board as the official comments of the Metropolitan Council for inclusion and response in the final Environmental Impact Statement.

2. That the Final Environmental Impact Statement be submitted to the Council so that it may determine whether the Council's concerns have been adequately addressed.

3. That the Council inform the Zoo Board that the draft EIS, site development plan and Zoo Area Development Guide will be reviewed as individual items according to applicable statutes but that every effort will be made to review these items concurrently, within the time constraints specified by law for each type of review.

4. That the Zoo Board be requested to grant the Council a time extension on the site development plan review period so that it may be reviewed concurrently with the peripheral area plan.

/sl

Rev. 12.30.75

METROPOLITAN COUNCIL

Suite 101 Capitol Square Building, Saint Paul, Minnesota 55101

Attachment A

RESOLUTION NO. 71-4

RESOLUTION APPROVING THE CONCEPT PORTION OF THE COMPREHENSIVE PLAN FOR SITE DEVELOPMENT OF THE MINNESOTA ZOOLOGICAL GARDEN

BE IT RESOLVED BY THE METROPOLITAN COUNCIL as follows:

1. The Minnesota State Zoological Board has prepared the concept portion of its comprehensive plan for site development (concept plan) of the Minnesota Zoological Garden at the Lebanon Hills site in Apple Valley, and has submitted it to the Metropolitan Council for consideration in accordance with Minnesota Statutes, Section 473B.06, Subdivision 6, all as required by Minnesota Statutes, Section 85A.02. The Metropolitan Council has referred such plan to its Referral Committee for consideration and recommendation to the Council of the action to be taken by the Council, and the Referral Committee has recommended that the concept plan be approved.

2. The Council has also reviewed and considered the concept plan and the recommendation of its Referral Committee, and hereby determines that the concept plan is consistent with that portion of the Council's comprehensive guide for the development of the Metropolitan Area now in effect, and with the orderly and economic development of the Metropolitan Area.

3. Upon receipt from the Board of that portion of its comprehensive plan for site development of the Minnesota Zoological Garden showing the (2) detailed development of the site, the (2) surrounding area and the (3) public facilities which would serve it: the Referral Committee shall study the matter and report its recommendation to the Council for final action.

4. The Executive Director is hereby authorized and directed to submit a certified copy of this resolution to the State Zoological Board.

Approved this 11th day of February, 1971.

METROPOLITAN COUNCIL

By _____
James L. Hetland, Jr., Chairman

By _____
Robert T. Jonvig, Executive Director

amn

RESPONSE TO METROPOLITAN COUNCIL

A The zoo site development plan was subsequently submitted and given final approval by the Metropolitan Council.

B The Zoo Area Development Guide has been separately submitted to the Metropolitan Council as revisions in the community comprehensive plans, and have been approved by Eagan and Apple Valley

C Since the Environmental Impact Statement and the Zoo Area Development Guide were submitted for separate review and approval according to applicable statutes, no comment regarding the Guide will be made in this section.

D Data on traffic projections and noise and air quality are included in the revised Final Environmental Impact Statement on pages 56, 57 and 58.

The Selected Alternate A, when constructed, will be able to adequately serve projected zoo oriented and weekend traffic. Measures to minimize congestion and associated pollution around the zoo site, i.e. traffic signalization and turn land provisions, will be considered during the design stage of this project.

The Minnesota Zoological Garden is currently studying alternative measures for transit and overflow parking. Park and ride programs, park and shuttle service for zoo employees, and rapid transit bus service from downtown Minneapolis and St. Paul are among the alternatives under consideration. Some overflow parking may be handled by use of internal zoo roads and parking in the Internal Services parking lot.

E Careful consideration will be given to access requirements during the design stage. However, the number of proposed access points on the east-west section of the zoo road are in keeping with local plans for the development of the areas south and west of the zoo site. Access requirements are further discussed on revised pages 64, 65 and 66.

Interim access routes are discussed on revised pages 64, 65 and 66. Local decisions concerning the timing and development of local roadway improvements will determine the adequacy of interim access.

F Truck volumes have been incorporated into the traffic forecasts. Truck volumes of 3-5 percent of the average daily traffic are expected to use County Road 38 until its relocation and construction. These numbers of trucks are not expected to produce significant effects.

G The response in D above applies here also. More information on transit is not available at this time.

H Studies show that turn-over rate, coupled with possible use of internal road parking, should be adequate for peak day attendance.

I See pages 50 and 51 for measures to protect against erosion and sedimentation.

J Some natural runoff from non-exhibit areas is retained by the nine small lakes or ponds on the site. There are no foreseeable adverse impacts on water quality and the zoo environment.

K Surface water impacts of the Selected Alternate A are discussed on revised pages 58 and 59.

L An explanation of the clay seals present in the soil as they relate to percolation of runoff water is contained in the Final Environmental Impact Statement on pages 30 through 33.

M See response to comment D of Metropolitan Council concerns.

N No comment is necessary.

TWIN CITIES AREA METROPOLITAN TRANSIT COMMISSION
330 Metro Square Building, Saint Paul, Minnesota 55101 Phone 612/227-7343

January 5, 1976

Minnesota Zoological Garden Project
c/o Gerard D. Hegstrom, Project Director
Room 102, Wentworth Office Center
33 East Wentworth Avenue
West St. Paul, Minnesota 55118

Re: Draft Environmental Impact Statement for MZG

Dear Mr. Hegstrom:

The MTC staff reviewed the MZG Draft Environmental Impact Statement and met with you in December to discuss the questions and concerns arising from that review. The primary concern was the amount of attention given to transit, especially in view of the identified adverse environmental impacts associated with traffic in the vicinity of the MZG, and the potential for reducing these impacts through use of transit.

As agreed in the MTC staff discussion with you, there is a need to place additional emphasis on various types of transit service to the zoo. However, the anticipated opening date allows adequate time for the MZG and MTC to cooperate in the development of transit solutions to zoo access problems, without the need to identify the specific nature of this service at this time. Work should commence on the planning of transit service to the zoo in 1976 so that proposals can be firmed up in 1977, prior to its opening.

You indicated to the MTC staff that while the draft EIS would not be altered, changes and additions required as a result of the public hearing and review by public agencies would be incorporated in an addendum which would, along with the draft report, become the final EIS. Your letter of December 30, 1975, to John Jamieson, a copy of which is attached, contains six paragraphs in quotes which we assume is the proposed part of the addendum dealing with transit. The only problem we have with this statement is the implication in the last paragraph that the MTC's route-ridership study covering northern Dakota County calls for a "demonstration service" from the West St. Paul area to the zoo site. The final report does not include such a demonstration. Rather, the report recommends limited stop service from downtown St. Paul to the MZG, with several major stops provided in South St. Paul and West St. Paul.

In summary, there is a clear need for the MTC and MZG to work together during the next two years on planning for transit service

to the new zoo. At this point in time, inclusion in the addendum of your proposed statement on transit, with the exception noted above, appears to provide adequate response to the concerns raised by the MTC staff in its review of the draft EIS.

Sincerely,

Doug Kelm
Chairman

DK/khf
enclosure

cc: John Boland, Metropolitan Council
Cam Andre

RESPONSE TO METROPOLITAN TRANSIT COMMISSION

The initial draft of the route ridership study indicates limited service for downtown St. Paul to the Minnesota Zoological Garden, with several major stops provided in South St. Paul and West St. Paul.

The Zoo Board is exploring park/ride/shuttle service to the zoo.

CHUCK LOWERY
PARK DIRECTOR
TELEPHONE
612 - 437 - 3191

DAKOTA COUNTY

★COURT HOUSE · HASTINGS, MINNESOTA 55033

December 10, 1975

Minnesota Zoological Garden Project
% Gerald D. Hegstrom, Project Director
Room 102, Wentworth Office Center
33 East Wentworth Avenue
West St. Paul, Mn. 55118

Dear Mr. Hegstrom:

I have reviewed the Minnesota Zoological Garden Environmental Impact Statement. As you know, Dakota County has supported the efforts of the Minnesota Zoological Garden in the past and have contributed as much as possible to aid in the success of the project.

The Dakota County Parks Department has acquired park land to the north and east of the zoo which is a vital part of our park system and also serves as a guarantee that undesirable development will not occur in those park areas adjacent to the zoo.

A | The EIS on page 57 relates to the use of the Zoo Area Development Guide as "an added tool specifically focused on controlling any adverse environmental effects in the area surrounding the zoo." The Eagan Land Use Development Guide and Apple Valley Comprehensive Plan are related to specifically which presents a problem for the Dakota County Parks Department.

Page 19, Section H of the Zoo Area Development Guide states that "The respective cities of Eagan and Apple Valley have designated certain existing ponds and lakes as either present or future storm water holding ponds." The official plans of these two communities show storm waters

COMMISSIONERS
1ST DISTRICT PATRICK SCULLY HASTINGS
2ND DISTRICT GERALD E. HOLLENKAMP SOUTH ST. PAUL
3RD DISTRICT LEO MURPHY EAGAN
4TH DISTRICT THOMAS P. STASSEN WEST ST. PAUL
5TH DISTRICT ERNEST W. AHLBERG FARMINGTON

being piped into at least 99% of the lakes and ponds of the County Park. This is not acceptable to the Dakota County Park Department. We cannot abide by any assumption that acceptance of the EIS by us would denote acceptance of the storm water plans of these two communities concerning county park property.

Sincerely,

Charles Lowery

Charles Lowery, Director
Dakota County Parks Dept.
1560 W. Hwy. 55
Hastings, Mn. 55033

CL/jh

cc: Mr. John Boland, Metropolitan Council
Mr. Donald Bridgewater, Minnesota Zoological Gardens
Mr. Laurence Mills, Dakota County Executive Secretary
Dakota County Board of Commissioners

RESPONSE TO DAKOTA COUNTY PARKS DEPARTMENT

A Overflow of designated ponding areas adjacent to the Selected Alternate A will enter Apple Valley's stormwater sewer system. From the area south of the zoo site, including the road, water is conveyed to the south-east into Farguhar and Long Lakes. This will prevent discharge into County Park ponds.

Acceptance of the adequacy of the Environmental Impact Statement does not commit Dakota County to concurrence with the Zoo Area Development Guide.

Village of apple valley 14200 Cedar Avenue S.
Apple Valley, Minnesota 55068

Telephone 612, 432-7105

November 6, 1975

Mr. K. K. McRae, District Engineer
Minnesota Department of Highways
3485 Hadley Avenue North
North St. Paul, Minnesota 55109

Re: 319,S.P.1929-01 T.H. 36, Project Development Report for Zoo Road

Dear Mr. McRae:

The Apple Valley City Council is in receipt of your letter of September 15th, 1975, and the report that accompanied the letter. The City Council reviewed the report on October 22nd, 1975, and requested that I transmit to you its concern over the timing of the project.

A According to the development schedule, the road is not scheduled to be open for traffic until the fourth quarter of 1979. You are, of course, aware that the Minnesota Zoological Gardens will be opening in mid-1977 and, while we are resigned to the fact that the road will not be complete by that date, it is urged that the Minnesota Highway Department amend the development schedule in whatever manner possible so the road can open earlier than the fourth quarter of 1979. It would certainly seem possible, for a road serving such a large state facility, that the Minnesota Highway Department could take some type of action to speed up the schedule.

Concerning the alternate corridor location proposed, the City Council requested that I convey to you its continued support of the Alternate A corridor. I might further add that the City of Apple Valley has received tentative right-of-way commitments for that portion of the Alternate A corridor, lying in an east-west direction. We would be pleased to provide you with further information on this subject.

Very truly yours,

CITY OF APPLE VALLEY

Richard G. Asleson
City Administrator

RGA:mm

cc: Mr. Robert Rosas
Mr. Donald Bridgewater

RESPONSE TO CITY OF APPLE VALLEY

A The Minnesota Department of Transportation shares Apple Valley's concern for the early completion of the zoo access road. Reasons underlying the project schedule can be found in the responses to comments expressed at the public hearing. Every effort will be made to expedite the process.

CITY OF EAGAN

3795 PILOT KNOB ROAD
EAGAN, MINNESOTA
55122

November 7, 1975

Minnesota Zoological Garden Project
% Gerard Hegstrom, Project Director
Room 102 Wentworth Office Center
33 E. Wentworth Avenue
West St. Paul, Mn. 55118

Re: Draft Environmental Impact Statement
Minnesota Zoological Garden
Eagan, Minnesota
File No. 49

Dear Sir:

The "Draft Environmental Impact Statement" covering the development of the Minnesota Zoological Garden in Apple Valley and the construction of the Zoo Access Road to serve this area has been reviewed as it relates to the City of Eagan.

The City of Eagan agrees with the proposed action in carrying out this project and finds that the environmental controls proposed for this development are adequate.

The City of Eagan favors the construction of the Zoo Access Road on alignment "A" and urges that all possible action be taken to expedite the completion of this highway. Failure to complete this access road prior to having large crowds in attendence at the Zoo will seriously overload the local road system regardless of what improvements are made to the City and/or County roads.

Yours very truly,

Herbert H Polzin

Herbert Polzin, Mayor

RESPONSE TO CITY OF EAGAN

No response to comments is necessary.

PUBLIC HEARING COMMENTS AND QUESTIONS

1. Q: Request to include Dakota County on list of responsible agencies for incinerator approval.

   A: Dakota County has been included. See revised page xi.

2. Q: If the Zoo Road was not constructed along Cedar Avenue would county plans to upgrade Cedar Avenue south of 35-E have similar impacts?

   A: The county at one time proposed to upgrade Cedar Avenue south of 35-E to a four-lane highway. Right-of-way requirements and access to adjacent areas would have remained much the same as with the existing two-lane highway. The construction of the Zoo Road will involve right-of-way acquisition and controlled access in keeping with freeway design and is not really comparable to county plans.

3. Q: Expressed concern over the timing of the zoo opening, access roads construction and the timing of county road improvement projects.

   A: County road improvement plans and interim access requirements are discussed on revised pages 64, 65, and 66.

4. Q: What is holding up construction of the Zoo Road?

   A: The zoo access road is proposed to be part of the federal-aid highway system. As such, there are procedures which must be adhered to in order to utilize federal-aid money. These procedures include following project development rules and regulations established by the Federal Highway Administration and compliance with state and national environmental laws. Once the Final Environmental Impact Statement is approved we can begin the design process which includes location, layout and detail design plans and approvals. Acquisition under both state and federal regulations takes 30 to 36 months. This phase includes title searches, negotiations with property owners, relocation and sometimes condemnation proceedings. All these things contribute to lengthening the time frame of the project.

5. Q: At what time in the Zoo Road process will property owners be contacted?

   A: Following approval of the Final Environmental Impact Statement, Selected Alternate and design work, Right of Way Agents will contact affected property owners. For further discussion of the project schedule, see revised page 21.

6. Q: What accesses are being planned for the areas west of Cedar Avenue?

   A: The Selected Alternate A would be designed as a freeway from 35-E south to proposed County Road 38. This design means limiting access along Cedar Avenue. To provide access to the areas west of Cedar, we are proposing construction of a frontage road from the Palimino Hills area south to proposed County Road 38 interchange. Also under consideration to provide for local access is construction of a half-diamond interchange at 127 Street crossing over Cedar Avenue. This half-diamond interchange, if approved and constructed, will provide access to and from the north onto Cedar Avenue.

7. Q: What impacts will the zoo access road have to the Fifth Edition of Greenleaf?

   A: The Selected Alternate A will be located approximately 300 feet from the property line of Greenleaf Fifth Edition. The actual location will be determined during the design stage of the project following negotiation with the cities and affected property owners.

   The impacts from air and noise are discussed on revised pages 56, 57 and 58. Aesthetics and visual techniques which will be used to lessen the perceived impact of the Zoo Road are discussed on revised pages 61, 62 and 63.

   It is not anticipated that the Zoo Road itself will have a significant impact on bordering residential areas. Potential commercial development in areas south of the zoo and associated effects are the responsibility of the respective municipality. The Zoo Area Development Guide identifies development goals for the area and discusses residential and zoo development conflicts.

8. Q: Have mass transit options been considered in the planning process?

   A: Mass transit has and continues to be explored with the Metropolitan Transit Commission.

9. Q: Who will provide police/security and fire protection of the zoo site?

   A: The zoo will maintain an internal 24 hour security force. The Minnesota Zoological Garden has entered into a cooperative agreement with the City of Apple Valley for police and fire protection of the zoo site. Radio communication will be maintained between the zoo and the Apple Valley Police and Fire Departments. The Zoo Security Director and the Apple Valley Police and Fire Department officials will work together to develop mutually acceptable training programs needed to accomplish their respective safety and security functions on the zoo site. First aid and medical emergencies will be handled initially by the zoo with backup to be provided by the Apple Valley Police and Fire Departments.

10. Q: How will problems of parking on local streets be resolved?

    A: Problems of parking on local streets will be worked out with the City of Apple Valley. The use of restricted parking areas is anticipated.

11. Q: What portion of the zoo site will be available for future expansion?

    A: Approximately 50% of the zoo site is available for future expansion.

12. Q: What are the open space plans for lands surrounding the zoo site?

    A: The open space plans for lands surrounding the zoo site are designated in the Zoo Area Development Guide. Plans have been developed by Eagan, Apple Valley, and the Dakota County Park Commission.

13. Q: Where will taxes from the concession stands go?

    A: Taxes from the concessions will be distributed according to local real estate tax legislation as noted on page 19 of the Environmental Impact Statement.

14. Q: What are the current plans for providing a trail system along the access road?

    A: The zoo will provide trail access along Johnny Cake Ridge Road for a link with the Apple Valley trail system. The Dakota County Park plans for a trail system are discussed on page 72 of the Environmental Impact Statement.

APPENDICES

APPENDIX 1

Site Recommendations for the Minnesota Zoological Garden

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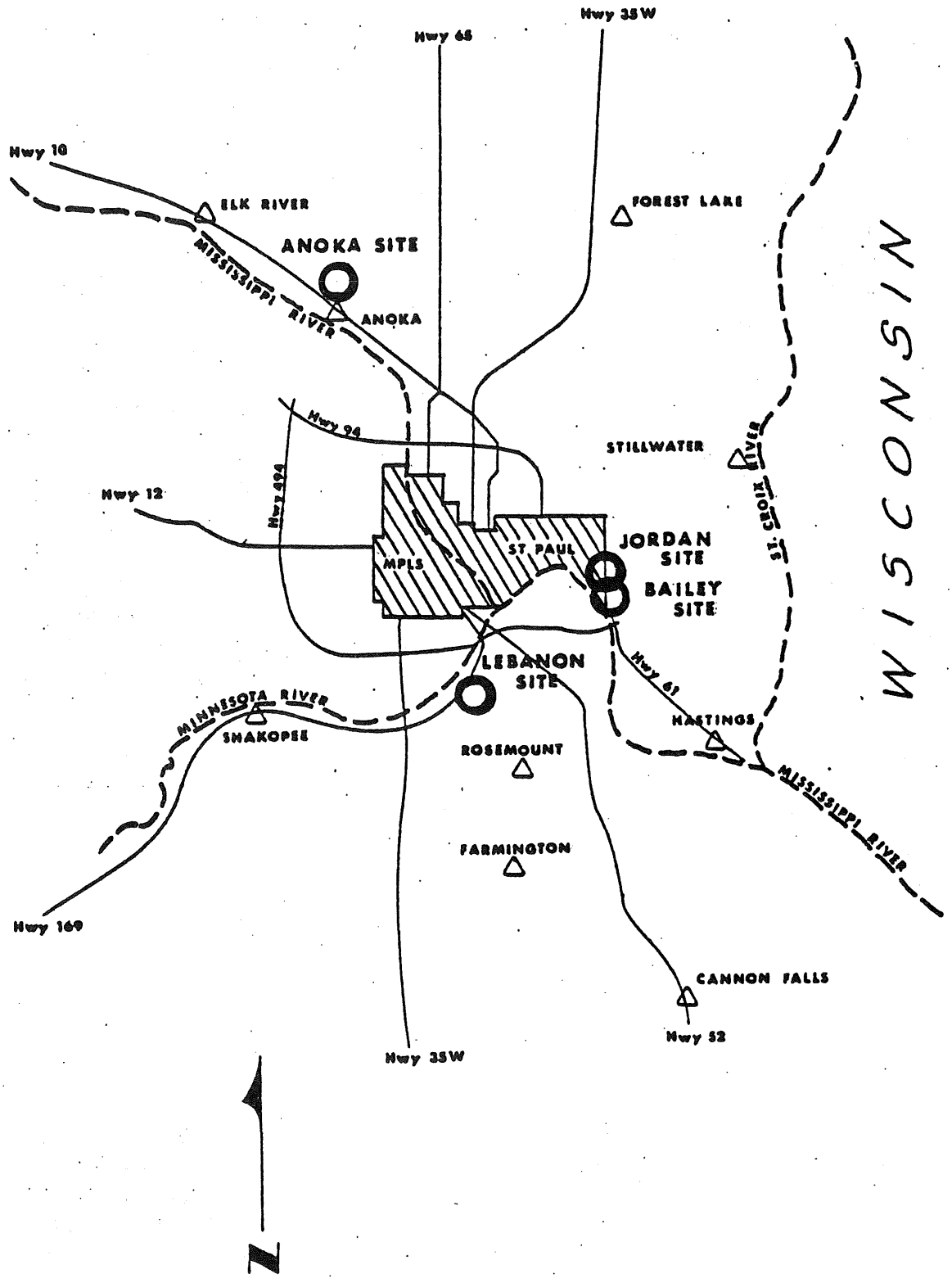


SITE EVALUATION	III-A
PROPOSED ZOO SITES	2

C. DESCRIPTION OF EVALUATION PROCEDURES

1.0 SELECTION OF CRITERIA

Criteria have been selected which are important planning and design determinants and which should be taken into account in evaluating each site.

Twenty-nine criteria were established and were reviewed with the Board on March 13, 1970. At the time the criteria were established no determination was made of their relative importance.

2.0 MEASURES

To ensure objectivity in rating each site, measures were established for each criterion. The measure is a quantitive description of the factors to be considered for each criterion. Five degrees of satisfaction for each criterion were established as follows:

++ Superlative satisfaction of criterion

\+ Satisfactory compliance with criterion.

0 Modest compliance with criterion

\- Unsatisfactory compliance with criterion

-- Undesirable with respect to the criterion

3.0 ANALYSIS AND EVALUATION

The sites were rated on the criteria by teams of professionals during a two week period. The analysis and evaluation was based upon visual observations, interviews with appropriate officials, analysis of existing charts, maps, aerial photographs, and other data. Interdisciplinary reviews were held in which individual raters compared notes , discussed various aspects of their ratings, and agreed on a single rating for each criterion for each site. These ratings were then used in the computerized site ranking procedure developed for this project.

3.0 ANALYSIS AND EVALUATION, Cont.

The final recommendations have been based upon the computerized site selection rankings and the professional judgement of the InterDesign team.

4.0 RANKING TECHNIQUES

The computerized site ranking method requires assignment of values or ranges of values to each symbol (++, +, 0, -, --). Clearly the order of superiority must be maintained in these weightings. Furthermore, it is essential that the superior rating and undesirable ratings receive a heavy weighting.

The following weight or range of weights are employed:

++	10
+	6-8
0	4-6
-	2-4
--	0

Thus the ++ counts heavily in favor and -- heavily against the site which earns those ratings. The 6-8, 4-6, 2-4 reflect uncertainties (e.g. a 0 is about half as good as ++, a + is about 75% as good, etc.)

The criteria which are adjudged to be equal in importance and at the same time, most important, are identified and given a weight of ten. Each other category is then assigned a value or range of values between zero and ten according to their importance relative to those rated ten. If it is believed that criterion "J" is between 40% and 60% as important as "Q" (where we assume "Q" is weighted ten) we assign a weighting range for "J" of four to six. This ability to maintain a range of weighting indicates an uncertainty in one's willingness to assign a particular value to the "J" weight.

4.0 RANKING TECHNIQUES, Cont.

This corresponds to a statement that Criterion "J" is approximately 1/2 as important as Criterion "Q". At this stage we assign weights or ranges of weights to all categories.

Thus we have a rating (++, +, 0, -, --) for each criterion for each site and a relative weighting or range of weights for each criterion.

Note carefully that a "range of weights" approach has been used to characterize the uncertainty in precise relative knowledge of the values of these parameters. This is retained throughout and is indeed at the heart of this technique. It eliminates the need to make unjustified assumptions about these values.

A uniformly distributed random number is now selected in each range of weights and ratings. The resulting weights are multiplied by the appropriate resulting rating and the products added to give a site index. These are compared for each site, the sites ranked numerically and the ranking recorded (not the site indices). This is repeated for many (thousands) of random number selections and the resulting site rankings are tabulated. At the conclusion of this procedure it is observed in what percentage of the total runs each site ranked first, second, -----. One may then say that irregardless of exactly what weight or quantitative rating was used, as long as it fell in the indicated ranges, in a certain percentage of the cases, the given ranking was achieved. In this way, one cannot say that "if only you had used .4 instead of .45 your answer would have been different". Indeed, in maybe 90% of the time the answers would have been the same! Thus the above technique permits confidence in the rankings without demanding unrealistically precise evaluations of ratings and weights.

InterDesign has based its recommendations in part on five runs of this method. These runs are described on the next page.

4.0 RANKING TECHNIQUES, Cont.

Run 1: The criteria rated "most important" by the Zoo Board, as established at their meeting on April 24, 1970, are weighted ten; all others weighted zero.

Criteria rated 10: 1,3,4,6,10,13,16,18,19,22,27

All others weighted 0.

Run II: The criteria rated "most important" by InterDesign are weighted ten to all others weighted zero.

Criteria weighted 10: 1,3,4,6,7,10,11,21,22,29

All others weighted 0.

Run III: The criteria rated "most important" by both the Zoo Board and InterDesign are weighted ten. Those rated "most important" by either the Zoo Board or InterDesign, but not both, are weighted seven to ten. All others are weighted two to five.

Criteria weighted 10: 1,3,4,6,10,22

Criteria weighted 7-10: 7,11,13,16,18,19,21,27,29

Criteria weighted 2-5: 2,5,8,9,12,14,15,17,20,23,24,25,26

Run IV: On April 24, 1970 the Zoo Board voted for those criteria which were to be rated "most important." The weightings in this run were determined from this voting. A criterion receiving nine votes is weighted 9-10, one receiving eight votes is weighted 8-9, etc. The resulting weightings are shown.

Criterion	Weighting
1	6-7
2	2-3
3	9-10
4	6-7
5	2-3
6	7-8
7	5-6

4.0 RANKING TECHNIQUES, Cont.

Criterion	Weighting
8	4-5
9	1-2
10	7-8
11	3-4
12	2-3
13	6-7
14	2-3
15	2-3
16	8-9
17	5-6
18	7-8
19	7-8
20	0-1
21	2-3
22	7-8
23	1-2
24	5-6
25	0-1
26	4-5
27	6-7
29	3-4

Criterion 28 is omitted in this run and in all other runs since the U.S.D.A. evaluation is considered to be overriding.

Run V: Criteria selected by InterDesign as "most important" are weighted ten, and all other criteria are weighted 3-8. The most important criteria are identical to those identified in Run #2.

Criteria weighted 10: 1,3,4,6,7,10,12, 21, 22, 29

All others weighted 3-8.

1.0 SITE EVALUATION CRITERIA

Accessibility of site

1. Time-distance relationship of site to the greatest number of people.

2. Convenience and accessibility of site to out-of-state visitors.

3. Accessibility of site via major highways from all major areas.

4. Existing access roads or potential of developing suitable access roads from highway interchange to site.

5. Accessibility of site via public transportation.

Relative cost and availability

6. Cost to the Zoo Board of acquisition and cost of off-site development prior to Stage I construction.

7. Cost of adapting the site itself to zoo requirements.

8. Revenues and cost of operations for each site.

9. Cost of future acquisition and/or development.

10. Availability of site and necessary access routes and utilities within the desired time span.

Surrounding environment

11. Compatibility of the existing surrounding neighborhood to zoo and zoo-related development.

12. Impact of zoo and zoo-related development upon the future surrounding neighborhood.

13. Degree of pollution and its effect upon site.

SITE EVALUATION CRITERIA, Cont.

14.0 Physical constraints of surrounding land inhibiting development.

15.0 Legal constraints and zoning control methods.

Essential services

16.0 Availability of an adequate source of water.

17.0 Availability of power and fuel.

18.0 Availability of sanitary sewer.

19.0 Availability of storm sewer or facilities for runoff water.

20.0 Availability of goods, services, housing for employees.

Site characteristics and adaptability

21.0 Quality of views and visual character.

22.0 Suitability of topography for zoo functions.

23.0 Suitability of unique characteristics (water areas, rock outcroppings, variety of environmental features).

24.0 Adequate surface and sub-surface drainage

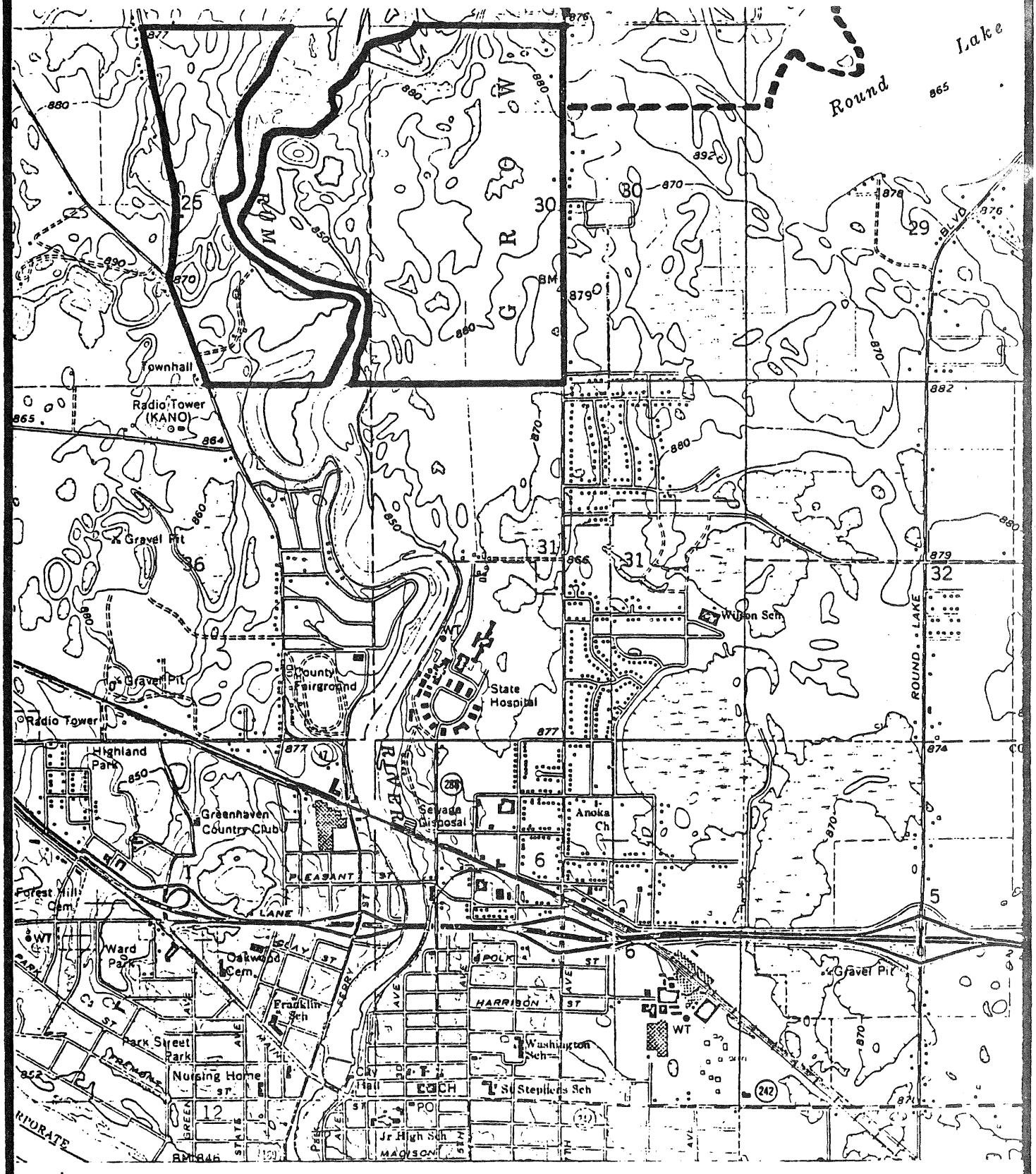
25.0 Campatibility of vegetation with program requirements

26.0 Suitability of soils and subsurface geology.

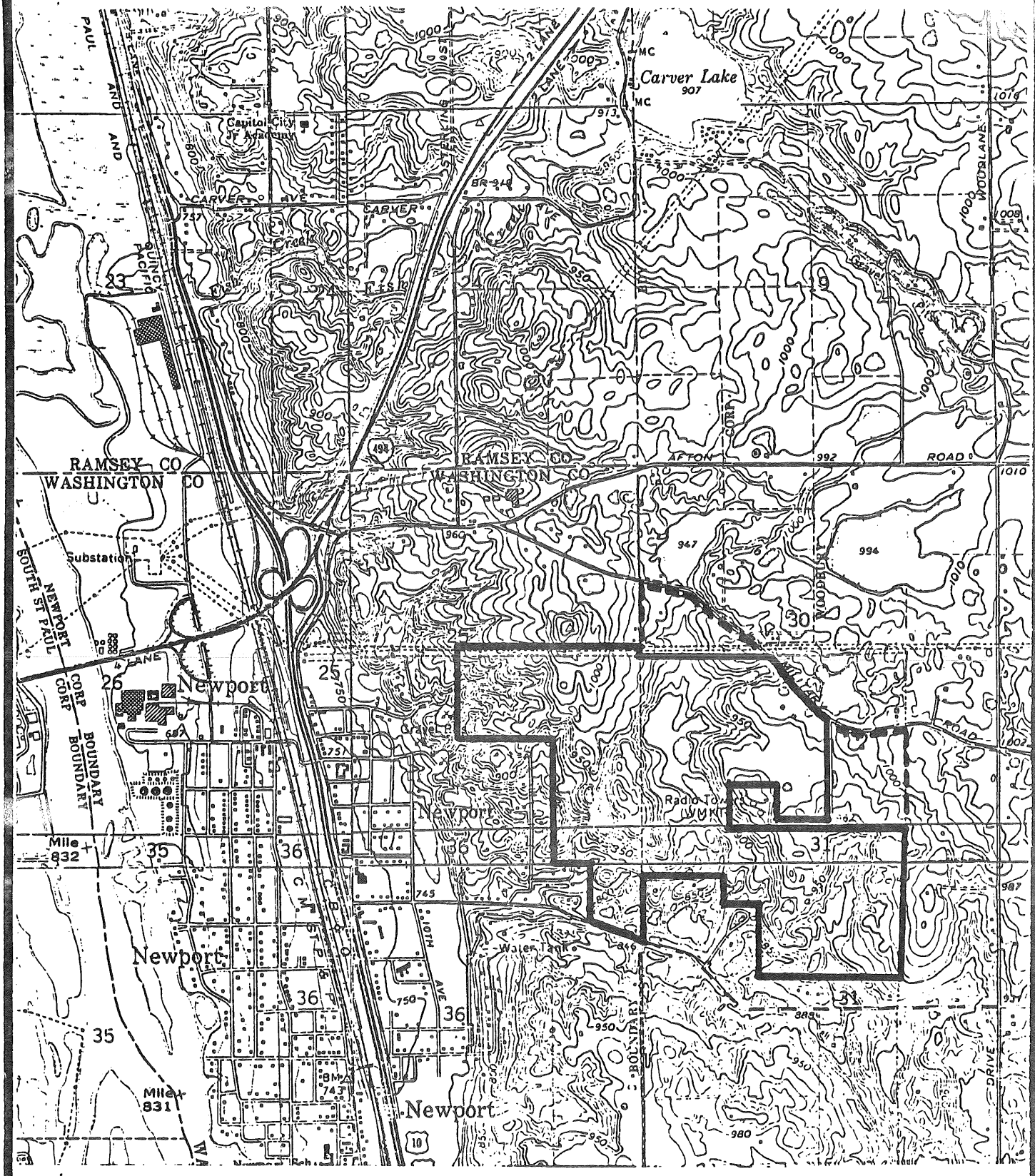
27.0 Suitability of land for expansion and buffer.

28.0 Ability of site to meet U.S.DA. requirements.

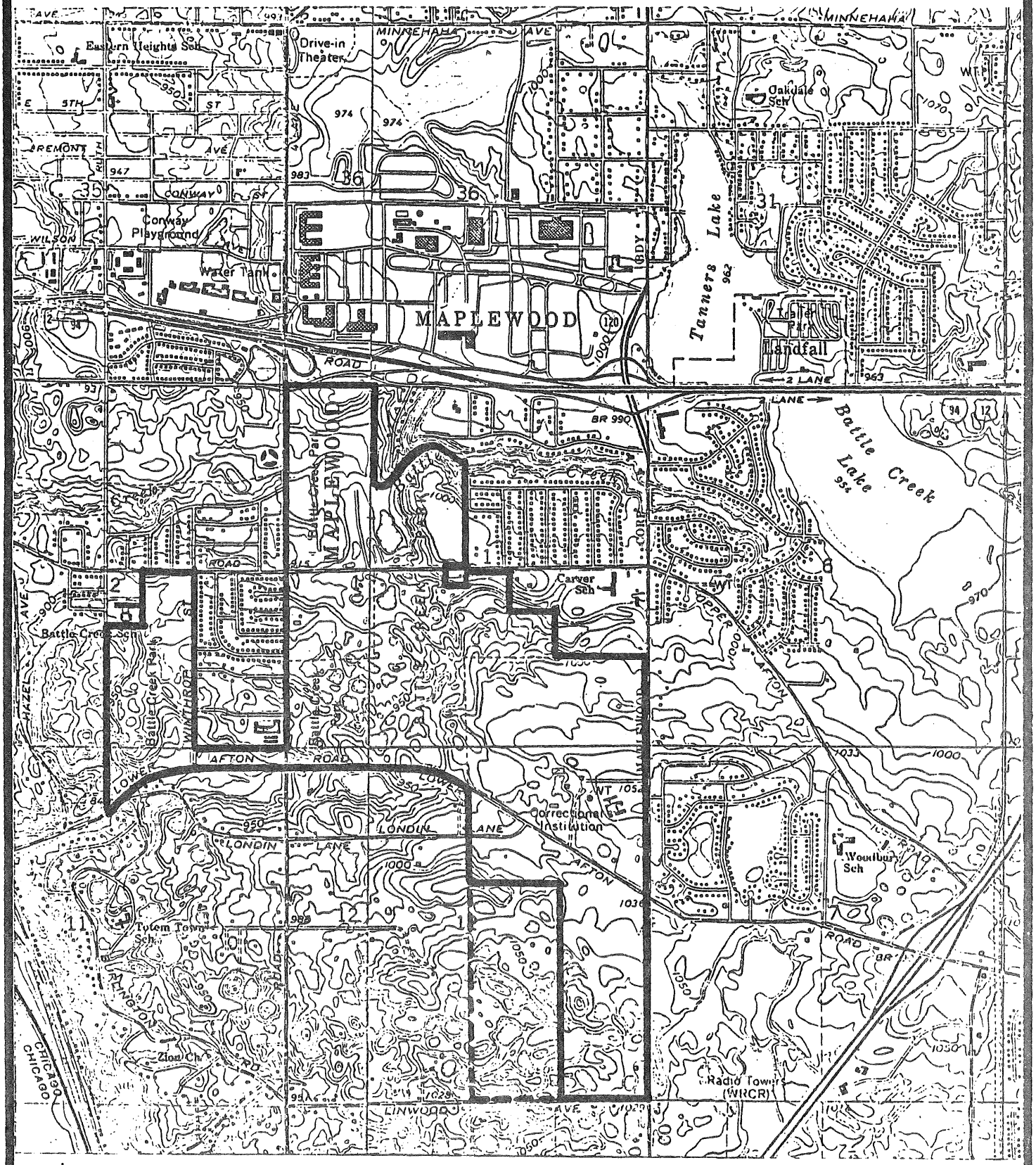
29.0 Degree of environmental quality after site developed.



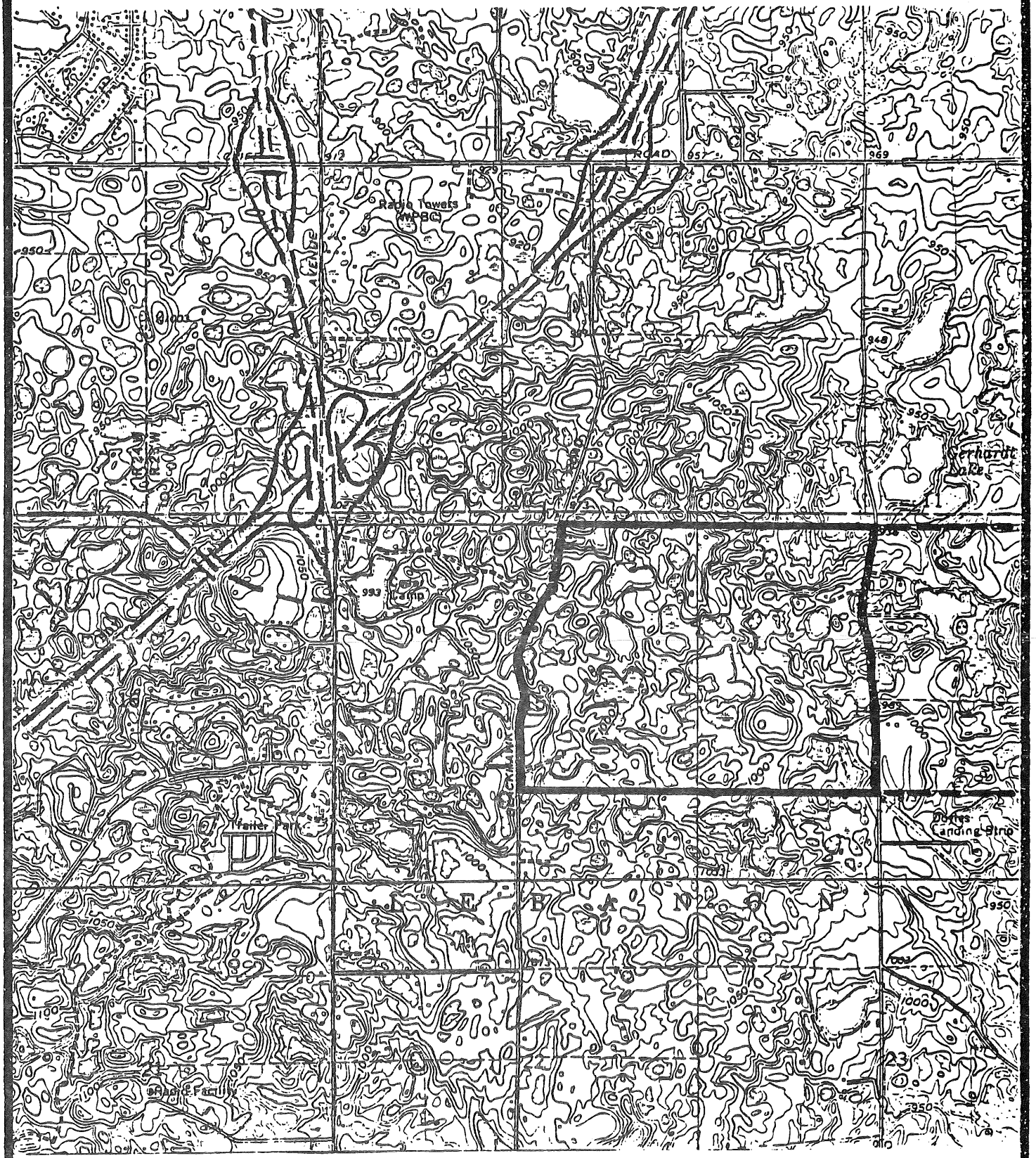
SITE EVALUATION	III-E
ANOKA SITE	10



SITE EVALUATION	III-E
BAILEY SITE	11



SITE EVALUATION	III-E
JORDAN SITE	12



SITE EVALUATION	III-E
LEBANON HILLS SITE	13

SUMMARY OF SITE RATINGS

ACCESSIBILITY:

Careful analysis was made of the traffic requirements and highway access to each of the sites. In general it was found that each of the sites serves both the metropolitan and the state population very well - all sites except Anoka are within two hours driving time of seventy percent of the state's 1985 projected population. All of the sites except Anoka are accessible within 45 minutes driving time to 50% of the state's population. All of the sites have fairly good accessibility from major highways - however, all of the major highways serving the sites need to have new interchanges or the present interchanges upgraded to accommodate the anticipated number of vehicles. Each of the sites similarly need new access roads (four lanes) to accommodate the anticipated number of vehicles.

COST AND AVAILABILITY:

Each of the sites were analyzed to determine the cost of land acquisition and off-site development, and the cost of adapting the site to the programmed facilities. Most of the sites fell within a fairly close range of costs when related to the projected overall long range costs for developing the zoo. Ratings for these criteria were based upon the relative importance of development costs to the overall cost of the zoo rather than direct dollar comparisons between sites.

One of the most important criteria which affected the overall ranking of the sites was the question of availability of land, access highways, and utilities. Because of the careful work done by the Board in selecting sites of comparable magnitude and characteristics, the problem of land acquisition did not affect ratings between the sites. On the issue of access to highways, however, all of the sites were affected by the fact that typically it takes three years to plan and construct proper access highways, which means that interim access roads would have to be used during 1972 at each of the sites, and only with the utmost cooperation of the highway department would it be possible to have newly constructed access highways open and available by the time the zoo opens in 1973. The planning and construction of utilities apparently presents some problems at several of the sites, and thus affected the ratings.

SURROUNDING ENVIRONMENT:

The surrounding environment was viewed as generally compatible on all four sites evaluated. None of the communities have completed and approved future land use plans for the neighborhood surrounding the zoo, however an attempt was made to talk with planners and various people at each of the communities to determine what type of development was probable surrounding the sites. It was also felt that the impact of the zoo would be favorable in all of the communities. One of the sites did have physical constraints which would inhibit planning and development of the zoo. Pollution was felt to be an important criteria, and for this criteria the impact of the future airport was considered at both the Lebanon Hills and Anoka sites.

ESSENTIAL SERVICES:

Adequate water supply and quality is available at all of the sites, and at all but one site city water would be available. Power and fuel is equally available at all of the sites. Sanitary and storm sewers however, were not equally feasible at all of the sites, and this affected the rating somewhat. Housing, availability of supplies, fire and police protection services were viewed comparable and equally available at all of the sites.

All of the sites would present an excellent opportunity for developing a zoo. The location of vegetation on the sites and its diversification of species wasn't viewed as important, but after careful analysis of the site, it was felt that a good zoo could be developed on even the roughest of the sites which was Lebanon Hills. Approximately 50 acres of the site needed to be graded relatively flat for parking, approximately 50 to 100 acres would have to be relatively flat (or workable), for the zoogeographic areas, and approximately 40 acres would be needed for farmland. The remaining acreage in the site could be rolling and present an interesting topography, and it was viewed that some variation on topography which would permit a sequential transition as one moved through the site would be highly desirable. On all of the sites some expansion was viewed as desirable and approximately 100 to 200 acres was available on all of the sites for that purpose.

1ST RUN

SITE	O	RANKS	1	18.00	PERCENT OF RUNS
SITE	O	RANKS	2	81.40	PERCENT OF RUNS
SITE	O	RANKS	3	.60	PERCENT OF RUNS
SITE	O	RANKS	4	.00	PERCENT OF RUNS
SITE	I	RANKS	1	.00	PERCENT OF RUNS
SITE	I	RANKS	2	.00	PERCENT OF RUNS
SITE	I	RANKS	3	1.00	PERCENT OF RUNS
SITE	I	RANKS	4	99.00	PERCENT OF RUNS
SITE	R	RANKS	1	.00	PERCENT OF RUNS
SITE	R	RANKS	2	.70	PERCENT OF RUNS
SITE	R	RANKS	3	98.30	PERCENT OF RUNS
SITE	R	RANKS	4	1.00	PERCENT OF RUNS
SITE	B	RANKS	1	82.00	PERCENT OF RUNS
SITE	B	RANKS	2	17.90	PERCENT OF RUNS
SITE	B	RANKS	3	.10	PERCENT OF RUNS
SITE	B	RANKS	4	.00	PERCENT OF RUNS

2ND RUN

SITE	O	RANKS	1	.00	PERCENT OF RUNS
SITE	O	RANKS	2	.00	PERCENT OF RUNS
SITE	O	RANKS	3	100.00	PERCENT OF RUNS
SITE	O	RANKS	4	.00	PERCENT OF RUNS
SITE	I	RANKS	1	.00	PERCENT OF RUNS
SITE	I	RANKS	2	.00	PERCENT OF RUNS
SITE	I	RANKS	3	.00	PERCENT OF RUNS
SITE	I	RANKS	4	100.00	PERCENT OF RUNS
SITE	R	RANKS	1	.00	PERCENT OF RUNS
SITE	R	RANKS	2	100.00	PERCENT OF RUNS
SITE	R	RANKS	3	.00	PERCENT OF RUNS
SITE	R	RANKS	4	.00	PERCENT OF RUNS
SITE	B	RANKS	1	100.00	PERCENT OF RUNS
SITE	B	RANKS	2	.00	PERCENT OF RUNS
SITE	B	RANKS	3	.00	PERCENT OF RUNS
SITE	B	RANKS	4	.00	PERCENT OF RUNS

3RD RUN

SITE	O	RANKS	1	.00	PERCENT OF RUNS
SITE	C	RANKS	2	93.40	PERCENT OF RUNS
SITE	O	RANKS	3	6.60	PERCENT OF RUNS
SITE	C	RANKS	4	.00	PERCENT OF RUNS
SITE	I	RANKS	1	.00	PERCENT OF RUNS
SITE	I	RANKS	2	.00	PERCENT OF RUNS
SITE	I	RANKS	3	.40	PERCENT OF RUNS
SITE	I	RANKS	4	99.60	PERCENT OF RUNS
SITE	R	RANKS	1	.00	PERCENT OF RUNS
SITE	R	RANKS	2	6.60	PERCENT OF RUNS
SITE	R	RANKS	3	93.00	PERCENT OF RUNS
SITE	R	RANKS	4	.40	PERCENT OF RUNS
SITE	B	RANKS	1	100.00	PERCENT OF RUNS
SITE	B	RANKS	2	.00	PERCENT OF RUNS
SITE	B	RANKS	3	.00	PERCENT OF RUNS
SITE	B	RANKS	4	.00	PERCENT OF RUNS

4TH RUN

SITE	O	RANKS	1	.00	PERCENT OF RUNS
SITE	C	RANKS	2	12.20	PERCENT OF RUNS
SITE	O	RANKS	3	87.80	PERCENT OF RUNS
SITE	O	RANKS	4	.00	PERCENT OF RUNS
SITE	I	RANKS	1	.00	PERCENT OF RUNS
SITE	I	RANKS	2	.00	PERCENT OF RUNS
SITE	I	RANKS	3	.00	PERCENT OF RUNS
SITE	I	RANKS	4	100.00	PERCENT OF RUNS
SITE	R	RANKS	1	1.00	PERCENT OF RUNS
SITE	R	RANKS	2	86.80	PERCENT OF RUNS
SITE	R	RANKS	3	12.20	PERCENT OF RUNS
SITE	R	RANKS	4	.00	PERCENT OF RUNS
SITE	B	RANKS	1	99.00	PERCENT OF RUNS
SITE	B	RANKS	2	1.00	PERCENT OF RUNS
SITE	B	RANKS	3	.00	PERCENT OF RUNS
SITE	B	RANKS	4	.00	PERCENT OF RUNS

5TH RUN

SITE	O	RANKS	1	.10	PERCENT OF RUNS
SITE	C	RANKS	2	96.70	PERCENT OF RUNS
SITE	O	RANKS	3	3.20	PERCENT OF RUNS
SITE	O	RANKS	4	.00	PERCENT OF RUNS
SITE	I	RANKS	1	.00	PERCENT OF RUNS
SITE	I	RANKS	2	.10	PERCENT OF RUNS
SITE	I	RANKS	3	17.80	PERCENT OF RUNS
SITE	I	RANKS	4	82.10	PERCENT OF RUNS
SITE	R	RANKS	1	.00	PERCENT OF RUNS
SITE	R	RANKS	2	3.10	PERCENT OF RUNS
SITE	R	RANKS	3	79.00	PERCENT OF RUNS
SITE	R	RANKS	4	17.90	PERCENT OF RUNS
SITE	B	RANKS	1	99.90	PERCENT OF RUNS
SITE	B	RANKS	2	.10	PERCENT OF RUNS
SITE	B	RANKS	3	.00	PERCENT OF RUNS
SITE	B	RANKS	4	.00	PERCENT OF RUNS

MINNESOTA ZOOLOGICAL GARDEN
CONSTRUCTION BUDGET/EXPENDITURE REPORT
August 21, 1975

Appropriation 22150 - 12 - 51 AID 590695X

Classification	(1) Approved Construction Budget	(2) Current Contractual Obligations	(3) Committed Reserves	(4) Vendor Payment
Facilities	$ 22,345,000	$10,770,301	$11,574,699	$1,863,094
Animals and Equipment	1,036,000	395,624	640,376	366,364
Design and Management	2,485,000	2,420,359	64,641	1,739,400
Audio-Visual Materials	170,000		170,000	
	$ 26,036,000	$13,586,284	$12,449,716	$3,968,858
	100%	52.2%	47.8%	15.2%

Legend

(1) Total approved and required construction budget
(2) Total monetary value of contracts and requisitions issued to date
(3) Difference between columns 1 and 2
(4) Actual payments made during the period June 1973 to August 21, 1975

SCHEDULE A
FACILITIES - BUILDING ACCOUNT
August 21, 1975

Facilities	Encumbrance Number	Approved Construction Budget	Current Contractual Obligations	Committed Reserves	Expenditures as of 8/15/75
01 Perimeter Fence Amco Hurricane Fence	00043/00302	$ 387,000	$ 343,175	$ 43,825	$ 137,736
02 Rough Grading					
a) Construction Fischer Sand & Aggregate	00044/00275	699,085	695,000	4,085	552,417
b) Williams Pipe Line	00242/00292	120,000	108,100	11,900	
c) Survey/Staking - Wm. Pipe Line Easement ZooTeam (SA #7)		1,500	1,500		
d) Soil Testing - ZooTeam		17,430	17,430		4,794
03 Well Bergerson-Caswell	00045/00321	66,000	65,222	778	61,961
04 Water Treatment/Storage Gunnar I. Johnson	00046/00283	402,785	400,137	2,648	341,799
05 a) Underground Distribution Fischer Sand & Aggregate	00047/00303	649,800	600,172	49,628	348,215
b) Survey/Staking as-built ZooTeam (SA #8 & 9)		15,200	15,200		9,100
06 Electrical/Comminications					
a) Electrical Dakota Electric		7,000		7,000	
b) Telephone Central Telephone		8,000		8,000	

Facilities	Encumbrance Number	Approved Construction Budget	Current Contractual Obligations	Committed Reserves	Expenditures as of 8/15/75
c) Wireless System		$ 5,000	$	$ 5,000	
d) Cable Purchase		25,000		25,000	
e) System Installation		121,500		121,500	
f) System Testing		5,000		5,000	
07 Internal Services					
General Construction M.A. Mortenson Co.	00128/00322	1,599,600	1,531,400	68,200	
a) Mechanical Horwitz Mechanical	00213/00324	515,000	497,081	17,919	
b) Electrical Claude M. Anderson	00214/00323	160,000	151,167	8,833	
08 Northern Trek					
General Construction	00152	2,572,300	2,572,300 *		
a) Survey/Staking ZooTeam		44,900	44,900		
b) Testing ZooTeam		3,000	3,000		
09 Main Building Complex					
a) Steel Roof Commercial Steel Fab.	00215/00325	490,000	448,500	41,500	
b) Early Contract Exc and Structural Concrete Bor-Son Construction	00216/00276	2,145,562	2,051,000	94,562	328,410
c) H.V.A.C.	00217	1,060,980		1,060,980	
d) Electrical	00218	803,400		803,400	

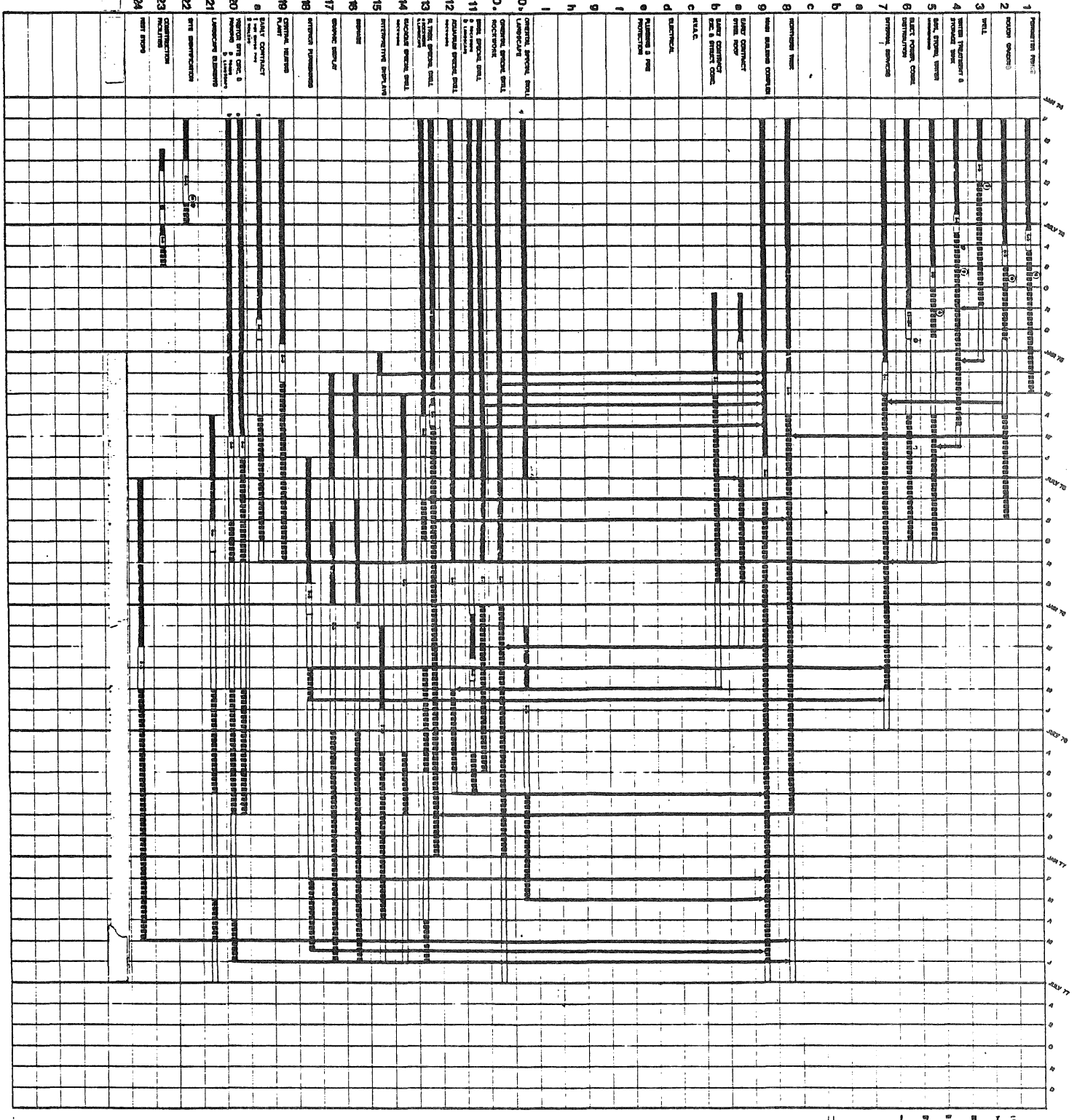
Facilities	Encumbrance Number	Approved Construction Budget	Current Contractual Obligations	Committed Reserves	Expenditures as of 8/15/75
e) Plbg/Fire Protection	00219	$ 659,200	$	$ 659,200	
f) General	00220	3,707,033		3,707,033	
g) Wood Roof Decking Structural Wood, Inc.	00221/00274	148,000	134,540	13,460	36,769
h) Sky Lights Super Sky Products	00222/00268	360,000	336,850	23,150	
i) Testing for 9a (SA #11) ZooTeam	00016	5,000	5,000		
j) Testing for 9b (SA #11) ZooTeam	00016	18,500	18,500		
k) Survey/Staking 9b ZooTeam (SA #10)	00016	14,300	14,300		
l) Survey/Staking 9f ZooTeam (SA #10)	00016	29,300	29,300		
m) Mechanical Testing 9c					
10 Oriental Plantings		382,000		382,000	
11 a) Interior Exhibit Const.		898,500		898,500	
b) Nocturnal Skills					
c) Minnesota Skills					
d) Aquarium Skills					
12 Exterior Plantings		912,000		912,000	
13 a) Northern Trek Rockwork	00055	889,900		889,900	
b) Northern Trek Plantings	00129	465,000		465,000	

Facilities	Encumbrance Number	Approved Construction Budget	Current Contractual Obligations	Committed Reserves	Expenditures as of 8/15/75
14 a) Exterior Exhibit Const.		$ 276,000	$	$ 276,000	
b) Skills Allowance					
16 Signage		185,000		185,000	
17 Graphic Display		400,000		400,000	
18 Interior Furnishings		100,000		100,000	
19 General Construction Willman Construction	00061/00284	65,000	62,676	2,324	8,424
a) Hot Water Piping Horwitz Mechanical	00226/00285	163,640	150,919	12,721	27,072
b) Boiler Heinen Co., Inc.	00227	180,300	173,750	6,550	
c) Mechanical Axel Neumann Htg/Plbg.	00228/00271	285,000	290,500	(5,500)	
21 Landscape Elements		65,000		65,000	
22 Site Identification	00064	4,000	3,682	318	3,162
23 Construction Facilities	00065	5,000	5,000		3,235
24 Rest Stop		200,000		200,000	
25 Dewatering		2,285		2,285	
		$22,345,000	$10,770,301	$11,574,699	$1,863,094
		100%	48.2%	51.2%	8.3%

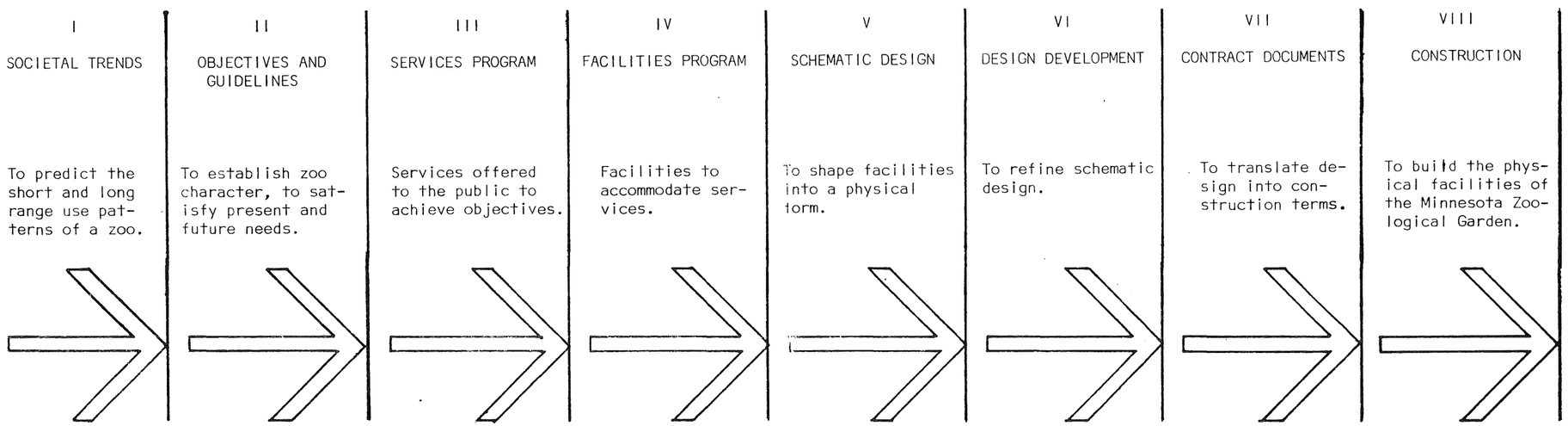
*Requisition only.

APPENDIX 4

CONTRACT PACKAGES MASTER SCHEDULE



APPENDIX 5


I
SOCIETAL TRENDS
To predict the short and long range use patterns of a zoo.
II
OBJECTIVES AND GUIDELINES
To establish zoo character, to satisfy present and future needs.
III
SERVICES PROGRAM
Services offered to the public to achieve objectives.
IV
FACILITIES PROGRAM
Facilities to accommodate services.
V
SCHEMATIC DESIGN
To shape facilities into a physical form.
VI
DESIGN DEVELOPMENT
To refine schematic design.
VII
CONTRACT DOCUMENTS
To translate design into construction terms.
VIII
CONSTRUCTION
To build the physical facilities of the Minnesota Zoological Garden.

APPENDIX 6

B. SOCIETAL TRENDS

To push structural and use obsolescence into the future as far as possible and bring into closer alignment the usual disparity between the planning horizon and the life of a physical facility, an attempt was made to predict the short and long range future use patterns and needs of society that must be satisfied by the Minnesota Zoological Garden.

A list of societal trends was developed. Those trends that had some impact on the future Zoo were listed and their design implications noted. The present program and design represents a facility that can best flexibly respond to these changes to make it suitable and adaptable to future needs.

TREND TOWARD	DESIGN IMPLICATIONS
1 Shift in value systems toward the subjective, individualistic and participative.	1. The animal is subject rather than object. Exhibits designed to demonstrate activity, herd reactions, individual animal capabilities and adaptive characteristics. Interaction of the animal with its own environment, visitor-exhibit interaction, animals trained to react to visitor or staff initiated stimuli.
2 Overall perspective as a requirement of good education, and an increased knowledge of science and technology among the general population.	2 The zoo becomes a place of multiple experience rather than just a place to view animals. Programs and exhibits must have a multi-level appeal from the most elementary to the use of telemetry and graphics to explain on-going research in the zoo.

TREND TOWARD	DESIGN IMPLICATIONS
3 An increase in social and biological research and awareness of their interrelationships.	3 Exhibits to demonstrate interrelationships of man, animals and the physical world. More knowledge of animal requirements cause an increased use of specialized equipment for environmental control and animal manipulation. The zoo is viewed as an educational and research resource. More specialized diets have been developed for the animals. These cost more but fewer zoo staff is required to prepare it and larger food storage areas are needed. The zoo will be viewed as an educational research resource. There will be an increasing demand for research programs using the zoo animal collection. Research facilities must be incorporated into the zoo with potential for expansion.
4 Increase in total population: counter trend toward "0" population growth.	4 As population grows, zoo attendance will increase; if the counter trend is effective, attendance will eventually level off. However, the most optimistic projections predict that "0" growth will not be achieved for 50-60 years.

TREND TOWARD	DESIGN IMPLICATIONS
5 Maximum use of facilities.	5 More days of zoo operations per year. Sections of the zoo facilities available after hours. Facilities must be designed for flexibility where it will not inhibit primary purpose. This trend will cause year around school; office and industrial space used more hours per day, work schedules staggered so there will be varied hours of the day and days of the week that are leisure time. This will tend to spread the usual peak days and peak hours out to a more uniform daily and weekly attendance.
6 Shorter work week – More leisure time.	6 Zoo attendance will increase. There will be more visits per year per person. The number of peak days per week will increase. The design must recognize that with more leisure time, there will be an increased dependance on the out of doors for recreation.
7 Smaller families	7 The ratio of number of adults to children will increase. Individual income is better.
8 Emphasis on life long learing.	8 Increase number of adult programs at the zoo.

TREND TOWARD	DESIGN IMPLICATIONS
9 Increase in out of classroom education.	9 Zoo exhibits used in study programs. Increasing demand for zoo supervised field trips and for supervised classwork and projects at the zoo. Internship programs at the zoo (teaching and medical.)
10 Both parents working.	10 The increase in number of children in nursery schools and at day care centers has caused a greater demand for zoo tours for preschoolers.
11 Internationalism	11 Worldwide regulations governing animal acquisition and transportation. More zoos will have joint programs of conservation, research, and animal acquisition.
12 Social concern - feeling of social responsibility for the young, handicapped, elderly and economically deprived.	12 Facilities must be designed to accommodate these groups. Special programs designed for these groups. Potential for a riding tour of the zoo for the elderly and the handicapped. Elimination of physical barriers on pedestrian ways.
13 Advances in multi-media technology.	13 Increase in the use of multi-media in exhibits. Exhibits must be designed to eliminate viewing and other sensory conflict. Potential for exchange of multi-media exhibits between zoos.

TREND TOWARD	DESIGN IMPLICATIONS
14 Development of long range rapid communication.	14 There must be the potential for an expanding and sophisticated communications network so that exhibits can utilize audio visual material, programs can originate at the zoo for out state population and so that health and research data can be exchanged between zoos.
15 Increase in percentage of population that are elderly and that are retired and their increased mobility.	15 An increasing number of people will be unable to walk as far as the usual zoo visit demands. An intra zoo transit system will eventually be required. The mass transit stop must be related to the internal carrier system.
16 Total area planning.	16 The project must be considered in terms of the larger area plan--transportation, metropolitan area expansion, etc.
17 Lack of respect for public property.	17 Increase in vandalism. An increased tendency toward supervised tour groups with an increase in supervision visitor ratio. Graphics, planting, etc. must be indestructable or inaccessible to zoo visitors.

TREND TOWARD	DESIGN IMPLICATIONS
18 Ecological awareness caused by urban crisis and world wide environmental degradation. This has given rise to more national and international conservation programs and regulations.	18 Preservation of the natural attributes of the site to the maximum degree possible. Conservation of energy and natural resources. Recycling of waste products if possible. Breeding programs for endangered species, both plants and animals. Fear of exotic introduction and decimation of natural populations has increased restrictions regarding intercontinental transfer of animals and makes animal acquisition more difficult. Zoos will specialize more on local fauna.
19 Variety and sophistication in transportation methods.	19 The auto will decrease in importance as a way to go to the zoo and new systems will be developed to carry visitors to the zoo and for touring the zoo.
20 Larger metropolitan areas - greater urban population and smaller rural population - counter trend to reverse this. Also, within the metropolitan area because of increased energy costs and commuting costs, there will be a decrease in incentives to live in the suburbs and increase in incentive to live in the inner city near jobs.	20 The area surrounding the zoo will become more urbanized reducing the potential for zoo expansion beyond its present borders so expansion must be at another site. As the inner city population grows, people will become less dependent on the automobile. Public transit will become an acceptable means of travel to outlying facilities.

TREND TOWARD	DESIGN IMPLICATIONS
21 A public awareness of energy conservation brought about by its increased cost will cause a decrease in the use of gas consuming recreational vehicles and an increase in foot and bicycle paths, an increase in attention to energy conservation through proper building design.	21 Smaller automobiles will become prevalent. Parking lots will be able to accommodate more cars per area in the future. More people will spend time at one place rather than a driving vacation which will cause an increase in use and average length of stay at the zoo by visitors with a decrease in long distance tourist. attendance. The zoo entry should be connected to any area bicycle or foot paths. Zoo buildings to be orientated and insulated to conserve energy. Natural ventilation, wherever possible.

FIGURE 7

Following are the objectives and guidelines for the Minnesota Zoological Garden as approved by the Board, August 10, 1973.

A. Animals will be presented in ecological perspective.

Guidelines:

1. The overall zoo organization shall be zoogeographic in nature and shall be implemented in ecological units.

2. The planting in any specific area shall be ecologically appropriate.

3. Where possible, visitors will seem to move through the animal environment rather than the animal displayed in the human environment.

4. Exhibits will be designed to illustrate specific biological characteristics and principles.

   a. There will be a special interpretation center.

5. Exhibits will demonstrate man's relationship to his world by showing the universality of interdependence in nature.

6. Where possible, animals will be presented in mixed exhibits.

B. The zoo shall be a year-round facility designed to take advantage of the Minnesota climate.

Guideline:

1. The animal collection shall emphasize northern climate and Minnesota species wherever practical.

C. The educational program shall have a state wide outreach and appeal to all ages and groups.

Guidelines:

1. There shall be a children's zoo in the interpretive center.

2. All presentations shall have a multi-level appeal.

3. A zoomobile operation shall be included in the zoo.

4. So far as possible, exhibits shall be tailored to support the biology curricula of Minnesota schools, including accommodation of students.

D. Major zoo programs of education, conservation and research shall be designed to enrich the recreational function of the zoo.

Guidelines:

1. Research activities and facilities shall be incorporated into the entire zoo.

2. Animal-visitor interaction shall be encouraged by exhibit design.

3. Exhibit design and presentation shall utilize the most advanced display techniques available.

4. There will be no rides of the carnival type on the zoo site.

E. The zoo shall emphasize the propagation of exhibited species.

Guidelines:

1. The zoo shall specialize in breeding of one or more endangered species appropriate to the Minnesota climate.

2. The zoo shall display appropriate numbers of specimens of representative species.

F. The zoo design shall preserve to the maximum degree possible the natural attributes of the site, including land forms, desirable vegetation, ponds and existing wildlife habitat.

G. The design of zoo facilities and exhibits shall incorporate the special requirements of the elderly and handicapped.

H. Wherever possible, facilities shall be designed with flexibility sufficient to allow for future expansion.

1. During design, the Board shall be notified of instances where this objective is not possible or practical.

I. Visitor traffic and service traffic shall be separated to the maximum degree possible.

J. Design and construction of support facilities shall receive first priority.

Guidelines:

1. Facilities must allow acquisition and holding of zoo animals before zoo opening.

2. There must be facilities to establish and maintain planting before zoo opening.

3. There must be on-site facilities to house zoological garden basic offices and staff concurrent with support facilities.

K. There shall be sufficient facilities and personnel for the normal maintenance, security and operations of the zoo.

L. Cooperation with major public agencies shall be encouraged in the development of zoo facilities and programs and development of land adjacent to the site.

M. The zoo shall be designed as a USDA approved zoo.

N. The State Zoological Board will assist the activities and development of qualified zoos throughtout the state.

O. The zoo shall be planned and programmed so that zoo operations will be self-financed and future zoo critical expansion may also be substantially self-financed.

P. All zoo facilities shall be designed to protect the health of visitors, employees and animals.

Guidelines:

1. Facilities shall conform to all Federal, State and local codes and regulations in regard to safety.

2. Barriers and exhibit access shall be designed for maximum protection of visitors and animals.

3. All work areas shall be designed to maximize the safety of employees.

4. There shall be a 24-hour day internal security force.

5. The zoo will be enclosed with a continuous perimeter fence.

6. There shall be a first aid station.

7. There will be a system of direct communication with local fire, police and medical services.

Q. Adequate facilities for the on-going animal care and health programs shall be provided.

R. Best available technology and methods in the management of large numbers of visitors shall be incorporated into the zoo design.

S. There shall be at least one exterior exhibit sequence featuring northern climate animals, providing both a vehicular and pedestrian viewing experience.

T. Zoo design and energy use shall emphasize energy conservation.

Guidelines:

1. Design of structures shall provide for efficient use of energy. In so doing, consideration shall be given to building locations, insulation qualities and mechanical and electrical conservation techniques and devices.

2. Commercially available sources of energy shall be evaluated for environmental impact, efficiency, cost and predictions regarding long-term availability.

3. To the extent feasible, heating systems shall be designed to permit use of a variety of energy vehicles.

4. In the location and design of facilities, consideration shall be given to future on-site energy production.

Table 4

SUMMARY OF PROJECTED ATTENDANCE ESTIMATES FOR MZG

Attendance Component		1973 to 1977			1977 to 1985		1985 to 2000	
		1973 Total	Growth Rate	1977 Total	Growth Rate	1985 Total	Growth Rate	2000 Total
0-20 miles	High	--	2.0%	687.9	2.0%	806.0	1.7%	1,037.9
	Middle	635.5	1.7	680.0	1.7	778.0	1.5	972.6
	Low	--	1.5	674.5	1.5	759.8	1.3	922.2
20-75 miles	High	--	--	--	1.0%	218.4	0.8%	246.1
	Middle	192.3	1.2%	201.7	0.8	215.0	0.1	218.2
	Low	--	0.8	186.3	0.0	186.3	0.0	186.3
75-200 miles	High	--	1.0%	176.2	1.0%	190.8	0.8%	215.0
	Middle	169.3	0.8	174.8	0.8	186.3	0.2	187.2
	Low	--	0.6	173.4	0.6	181.7	0.0	182.8
Tourist	High	--	8.0%	276.6	6.5%	458.1	5.0%	953.3
	Middle	203.4	7.0	266.6	5.0	379.4	5.0	789.5
	Low	--	6.0	256.7	4.0	351.7	3.0	548.3
Total	High	--	2.8%	1,342.4	2.8%	1,673.3	2.6%	2,452.3
	Middle	1,200.5	2.3%	1,311.8	2.2%	1,558.7	2.3%	2,167.5
	Low	--	1.9%	1,291.9	1.7%	1,479.5	1.5%	1,839.6
	Projection	1,200.5	2.3%	1,311.8	2.2%	1,557.5	2.3%	2,195.4

Table 1

SUMMARY OF POPULATION DATA AND PROJECTIONS
(Millions of Persons and Annual Compound Percentage Growth Rate)

Area	Population (U.S. Census) 1960	1967	1970	Projections 1985 Estimated Population[a]	1970-1985 Growth Rate	2000 Estimated Population[b]	1985-2000 Growth Rate
Minnesota, state total	3.414	3.625	3.805	4.52	1.2%	5.41 (H) 5.25 (M) 5.09 (L)	1.2% 1.0 0.8
7-County Metropolitan area	1.525	1.807	1.874	2.399	1.7	3.09 (H) 3.00 (M) 2.91 (L)	1.7% 1.5 1.3
Balance of state	1.889	1.818	1.931	2.13	0.6	2.40 (H) 2.16 (M) 2.13 (L)	0.8% 0.1 0.0
Wisconsin	3.95	4.19	4.43	5.15	1.0	5.98 (H) 5.80 (L)	1.0% 0.8
Iowa	2.76	2.77	2.82	2.96	0.3	3.19 (H) 3.09 (M) 2.96 (L)	0.5% 0.3 0.0
South Dakota	0.68	0.67	0.66	0.71	0.5	.77 (H) .71 (L)	0.5% 0.0

H = High estimate.
M = Middle estimate.
L = Low estimate.

a. Revised estimates -- upper Midwest Council 1973.
b. Extrapolations by Real Estate Research Corporation.

APPENDIX 10

MZG Update Analysis

	Average Number of Visits			
	Without ZooRide		With ZooRide	
	Daily	Annual	Daily	Annual
7 Peak days	30,000	210,000	30,000	210,000
27 Summer weekend days	14,000	378,000	14,500	391,500
86 Summer weekdays	6,000	516,000	6,500	559,000
70-Fall-Winter weekend days	1,500	105,000	2,500	175,000
174 Fall-Winter weekdays	600	104,400	700	121,800
364 Days total (rounded)		1,300,000		1,500,000

9. The peak number of visitors in the park at any time will range from about 40 percent (on winter weekdays) to 60 percent (on weekends and peak days). Within the park, the Northern Trek is expected to accommodate the greatest number of people, up to 40 to 50 percent of those present (which will occur usually during peak hours between noon and 2 o'clock in the afternoon). Cold fall and winter days, however, will find generally less than 25 or 30 percent of the MZG visitors in the Northern Trek. An attractive ZooRide will decrease the numbers and percentages of pedestrians in the Northern Trek but will increase the total attendance on fall-winter days.

10. Among various concessions, food service attracts the most patronage and dollar revenues, typically accounting for 50 to 75 percent of all concession sales. Tour services and exhibit rides are the next most important sources of concession revenue (and affect the percentage accounted for by food sales). Concession sales volume per square foot appears to depend more on merchandising performance than on the amount of space devoted to such facilities.

APPENDIX 11

Table 7 FIRST-YEAR DESIGN LEVEL OF ATTENDANCE

Source	1977 Population (1,000's)		Visit Generation Factor (Visits/1,000)		Attendance Component
Metro area (0-20 miles)	1,813.4	X	375	=	680,000
Other suburban (20-75 miles)	1,119.3	X	180	=	201,700
Balance of state (75-200 miles)	3,468.3	X	50	=	173,400
Tourists	2,852.0	X	90	=	256,700
Total annual attendance (1977)					1,311,800

SEASONAL DISTRIBUTION

		1977
7 Peak days @ 30,000	=	210,000
27 Summer weekends @ 14,000	=	378,000
86 Summer weekdays @ 6,000	=	516,000
70 Fall-Winter weekends @ 1,500	=	105,000
174 Fall-Winter weekdays @ 600	=	104,400
364		1,313,400

Source: Real Estate Research Corporation.

Table 8
WITHOUT ZOORIDE

MINNESOTA ZOOLOGICAL GARDEN
TYPICAL SEASONAL DAY VISITOR DISTRIBUTION- 1977

	Fall-Winter Weekend	Fall-Winter Weekday*	Summer Weekend	Summer Weekday	Peak Day
A. Northern Trek	25% (300)	20-25% (50)	50-55% (4,300)	50-55% (1,600)	40-45% (7,500)
B. Lake/ Main Entry Complex	10-15% (100)	20-25% (50)	10-15% (900)	10-15% (300)	10-15% (2,200)
C. Oriental/Minnesota/Whale	40-45% (400)	20-25% (50)	20-25% (1,800)	25-30% (750)	20-25% (4,000)
D. Education/Nursery/Interpretive	10-15% (150)	20-25% (50)	5-10% (600)	5-10% (200)	15-20% (3,000)
E. Parking	4% (35-40)	3-4% (5-10)	6-7% (550)	5% (150)	8% (1,500)
Peak In-Park Attendance (as percentage of total daily attendance)	930-1,020 (55-60%)	250 (40%)	7,700-8,400 (55-60%)	3,000 (50%)	17,500-18,500 (60%)

* Primarily various school groups (50-60% of attendance) whose distribution is characterized by waves of groups patronizing various exhibits.

IV. - DESIGN CONSIDERATIONS

Final design of the MZG must make allowances for providing adequate capacities for various functional elements of the zoo. Principal concerns are the sources and distribution of external traffic flows, the entry/exit rates and peak number of visitors in the zoo at various times, the spatial distributions of visitors within the zoo, and the levels of patronage to be anticipated at various types of concessions.

A. Traffic Flows

Since visitors to the MZG will be drawn from all over the state of Minnesota and also from northwestern Wisconsin, northern Iowa and eastern South Dakota, the proportions of traffic generated from different directions and the amount of traffic generated on access routes is of interest.

1. Metropolitan Area Traffic

Roughly 60 percent of MZG attendance will originate within the Twin Cities Metropolitan Area (TCMA) seven-county area, or about 800,000 visits at the projected 1977 attendance level. As noted, the TCMA population is heavily concentrated in the Minneapolis and St. Paul urbanized areas. Future population growth will tend to follow the established distribution and concentration, although spurs of outward growth are anticipated in Anoka County to the north, and to the northwest and northeast. There is also an evident pattern of suburbanization extending south, to Bloomington and toward the MZG site. The forecasted population growth rates for the TCMA and growing attention toward confining urban sprawl, however, suggest that it may be many years before the MZG site area is densely populated.

Within the metropolitan area (20-mile distance band, roughly) most traffic associated with the MZG will tend to be collected in the Twin Cities and approach (or depart) the site via either Route 35W in 1976, then 1978, and now probably will be further delayed, so that interim approaches along county roads will have to be employed when the MZG first opens. When estimated from 1970 population maps, all of the population north of the Minnesota River will tend to travel via Route 494 or other collectors to reach Route 35W, and thence to the site along a proposed Zoo Road running east and west, south of the site. Probably, less than one third of the population of Dakota and Washington Counties, equivalent to about

four percent of the TCMA population, resides in locations that would be more convenient to the MZG site along other secondary roads. This is less than three percent of the estimated MZG attendance, roughly equal to 28,000 visitors annually in 1977, or about 250 cars on a peak day.

2. Other Traffic

A similar result is apparent from the population distributions in other distance bands, although the bulk of the attendance drawn from Wisconsin and eastern Iowa will be approaching from the southeast. Nevertheless, the faster average speeds attainable on interstate freeways will tend to attract most of this traffic to such major routes as I-94, and thence to I-35W or, when completed, I-35E. We estimate that no more than 5 to 7 percent of the total estimated attendance will approach from the southeast along U.S. 52. This is equivalent to a traffic volume of from 425 to 600 cars on a peak day.

The balance of the attendance and traffic will tend to approach the site from I-35W and I-35E. The great bulk of this will be collected west of the site and approach it along existing county and municipal roads or along the proposed Zoo Road.

3. Summary

The total distribution of annual attendance and peak day traffic may be summarized as follows.

Approach and Origin		Annual Attendance (Total Visits)	Peak-Day Traffic (No. of Cars)	Distribution (Percent)
Along I-35W	From North	1.0 to 1.1 Million	6,400-7,600	80-85%
	From South	110,000-150,000	800-1,000	9-12
Along U.S. 52 or county roads	From North	25,000- 40,000	200- 300	2- 3
	From South	65,000- 90,000	400- 600	5- 7
	Totals	1,300,000	8,000-9,000	100%

These figures are referred to the projected 1977 annual attendance and a peak-day attendance of 30,000, with an average of 3.5 persons per car. The peak-day auto traffic would be reduced, however, by the proportion of attendance to be carried by buses. It is also assumed that the distribution of tourist visitors will follow the same pattern as residential visitors, although it is likely that a smaller proportion of tourists will use the secondary approaches.

B. Transportation Mode

Because of the distance of the MZG from downtown areas and the strong likelihood of a continuing gasoline shortage, zoo plans must take into account the numbers of visitors that may arrive by bus rather than private automobile. In fact, cooperative programs may be developed with the rapid transit district to provide special bus service to the MZG. Since the MZG site is 15 to 18 miles from either downtown Minneapolis or St. Paul, where the bulk of the TCMA population is concentrated, a convenient bus service from the downtown areas could increase the accessibility of the MZG to a large proportion of local residents. Weekend use of state and municipal parking areas as collection points for a shuttle bus service to the MZG is a possibility.

While somewhere between one third and one half of the metropolitan visitors could perhaps be served more economically by some such system, an all-out effort would be necessary to attract this large a fraction of visitors to come by bus. By comparison, the recent professional football Superbowl VIII in Rice Stadium (Houston) was planned to accommodate roughly 25 to 30 percent of the attendance arriving in buses,* and this represents another kind of upper limit, since that type of event includes a high proportion of out-of-town interest, with many visitors staying in hotels and motels, so that charter bus transportation is optimal. A comparable level of bus service at the MZG on a peak day would produce a requirement for about 150 to 175 bus-loads of people.

We estimate that even a maximum bus program to serve MZG probably would fall short of this, perhaps reaching a level of from 15 to 20 percent of attendance on a peak day, or from 90 to 125 bus-loads. Only a moderately attractive bus program would result in reduced attendance carried by this mode, say on the order of 10 to 15 percent of attendance (60 to 85 bus-loads). A poor, costly bus program probably would be unable to attract more than 5 percent (25 to 30 bus-loads on a peak day).

* 400 buses for 72,800-seat stadium capacity, excluding press buses (Houston Post, December 19, 1973, p.5/D).

MEMORANDUM

TO Members of the Northern Dakota County/Southern Washington County Route-Ridership Improvement Project Project Management Board and Community Advisory Committee.

FROM Robert Pearson, Project Coordinator

DATE September 4, 1974

SUBJECT Progress Report

Since the initiation of this project several months ago, important progress has been made, including:

The organization of the Community Advisory Committee. This Committee has 20 members and has already met five times. Attendance has been relatively good, especially considering that many of the meetings conflicted with normal summertime activities.

The Project Management Board selected Barton-Aschman Associates as the project consultant.

The study design, budget and selected consultant have been submitted to the Urban Mass Transportation Administration for their review and approval.

The MTC's Transit Operating Division has completed an inventory of the bus routes and services for the study area.

The Community Advisory Committee has completed and adopted the Goals and Objectives for the project.

Formal approval by the Urban Mass Transportation Administration is expected within 3 or 4 weeks. Very shortly thereafter, a physical survey (by bus) of the existing bus routes and services will be made. This, together with the activities already completed, will permit the initiation of the Market Analysis Task.

In summary, the project has been and is expected to continue to be actively and timely conducted.

Attached hereto are the Goals and Objectives developed and adopted by the Community Advisory Committee.

km
enc

Goals & Objectives
for the
Northern Dakota County/Southern Washington County
Route-Ridership Improvement Project

GOAL

Increase and improve transit services to, from, and within the study area which will be compatible with and improve the local quality of life, such as:

- Preserve the environment.
- Reduce air pollution.
- Reduce traffic congestion.
- Conserve fuel resources.

OBJECTIVES

1. Provide mobility for transit dependents, including:

   - The elderly.
   - The handicapped.
   - The young.
   - Those without automobiles.
   - The economically disadvantaged.

2. Provide transit to serve the existing and future activity centers within the study, such as:

   - Employment centers.
   - Residential centers.
   - Retail centers.
   - Educational facilities.
   - Medical facilities.
   - Public and institutional facilities.
   - Recreational areas.
   - Minnesota Zoological Gardens.
   - Homart Center.

3. Provide transit service to and from major activity centers outside of the study area, such as:

   - Twin Cities International Airport.
   - Minneapolis Central Business District.
   - St. Paul Central Business District.
   - Southdale Shopping Center.
   - 3M Center Complex.
   - Metropolitan Sports Center Complex.

4. Provide bus-related road improvements which increase transit's acceptance and convenience, such as:

   - Local bus shelters.
   - Community bus stations.
   - Park & ride facilities.
   - Kiss & ride facilities.
   - Bus turnouts.
   - Pavement improvements.
   - Operational & safety improvements.
   - Bicycle park & lock facilities.

5. Determine the need for and, if needed, provide the following types of transit services:

   Dial-A-Ride service.
   Subscription bus service.
   Van pools.
   Express bus service.
   Limited-stop bus service.
   Local bus service.
   Charter & special bus service.

6. Identify the transit services and related improvements needed to serve the Minnesota Zoological Gardens, some of which may be outside the scope of the project.

7. Identify river crossing problems which would restrict transit movements to and from the study area.

8. Provide transit and related improvements which improve east-west mobility within the study area.

9. Provide transit and related improvements which complement local land, highway and transit development plans.

10. Provide a new bus route and schedule information system centered on Northern Dakota County and Southern Washington County, rather than the center cities and recommend an improved route identification system.

APPENDIX 15

MINNESOTA STATE
ZOOLOGICAL BOARD

August 20,1974

I am an intern from St. Cloud State College with the Minnesota State Zoological Board. I have compiled a report on the animal and agricultural activities within 3 miles of the Apple Valley State Zoo site. The preparation and field survey has been conducted from June 10 to August 20. I had three major aims: (1) To get an animal census of the three mile area, (2) Get an indication of agricultural activity and (3) Get a general feeling for public sentiment.

This report is the preliminary base for a "required" report for the Department of Agriculture, for which my "survey" may be updated at a later time. I have covered to the best of my ability, this area, using whatever means available to me to locate animals and agriculture. I have relied a great deal on the people I interviewed for their help in pinpointing animals and agricultural because otherwise a great deal more time would have been spent in the field.

Charles Wilson

Charles Wilson

SURVEY REPORT

The area being dealt with includes four metropolitan communities: Apple Valley, Eagan, Burnsville and Rosemount. Most of Apple Valley is included within this 3 mile area as is a considerable portion of Eagan. This study also extends into Burnsville and Rosemount in the outer rings of the study(1 1/2 to 3 mile area). The most intensive research was in the 1 mile ring which includes only Apple Valley and Eagan.

Zoning in these communities is varied by virtue of the different stages of development in the area. Burnsville is completely zoned and is probaly one of the most developed communities of the four. Most of the area involved in the 3 mile zone is primarily residential zones(mixture of a number of different type zones). Most areas are zoned for a low to medium density residential development with some business districts zoned along the major traffic carriers (Highways 13, 11, 7 and 32). Most of this zoning is adjacant to Highway 13. Eagan is a quickly developing community which is developed mainly in it's northwestern corner along Highway 13 and Cedar Avenue. Growth is moving south but there is still a great deal of open and undeveloped land in most areas of Eagan. Eagan is gearing for residential development which goes along with related business and Industrial districts presently located near Highway 13. Rosemount is probably the least developed of these four areas. Most of the area coming into the 3 mile study area is zoned agricultural and is being actively farmed or is inhabited by homes on large land areas. There is very little development here except in the city of Rosemount itself which is zoned. Other than this area it is open, undeveloped land used extensively in farming. The city of Apple Valley is quickly growing, as is indicated by the amount of construction going on in that area. They are keeping in mind the same major type of development as are the other communities. They are looking for mainly residential development with some supporting business and industry. The major area of commercial zoning is at Cedar and County Road 42 with an industrial area between County Roads 42 and 40 in south central Apple Valley. Most of the industry in

(cont.) this area consists of gravel and concrete operations. The rest of the community is mainly residential or residential-agriculture zones.

The zoo is at this time surrounded by residential or interim zones. Three sides of the zoo are bordered by Apple Valley and the northern extreme runs into Eagan. The area in Eagan is now zoned agricultural with the other three sides being zoned in various forms of residential zones. The land use adjacant to the zoo is mostly of an open or low density type. Most people living close to the zoo are on large areas of land that support some livestock and affords some agriculture. An exception to this type of use is the trailer park across Galaxie from the zoo, on the west.

Each of the four communities has some type of animal restrictions. They all prohibit livestock from zoned or platted areas. They also regulate the animals in other areas by virtue of the amount of land needed in order that animals may be kept on the premises. Rosemount and Eagan specify 5 acres as the amount of land needed for animals(Rosemount- 20 acres for cattle). Apple Valley and Burnsville say that a certain amount of land surrounding the land must be free of development(houses, schools, churches, etc.).

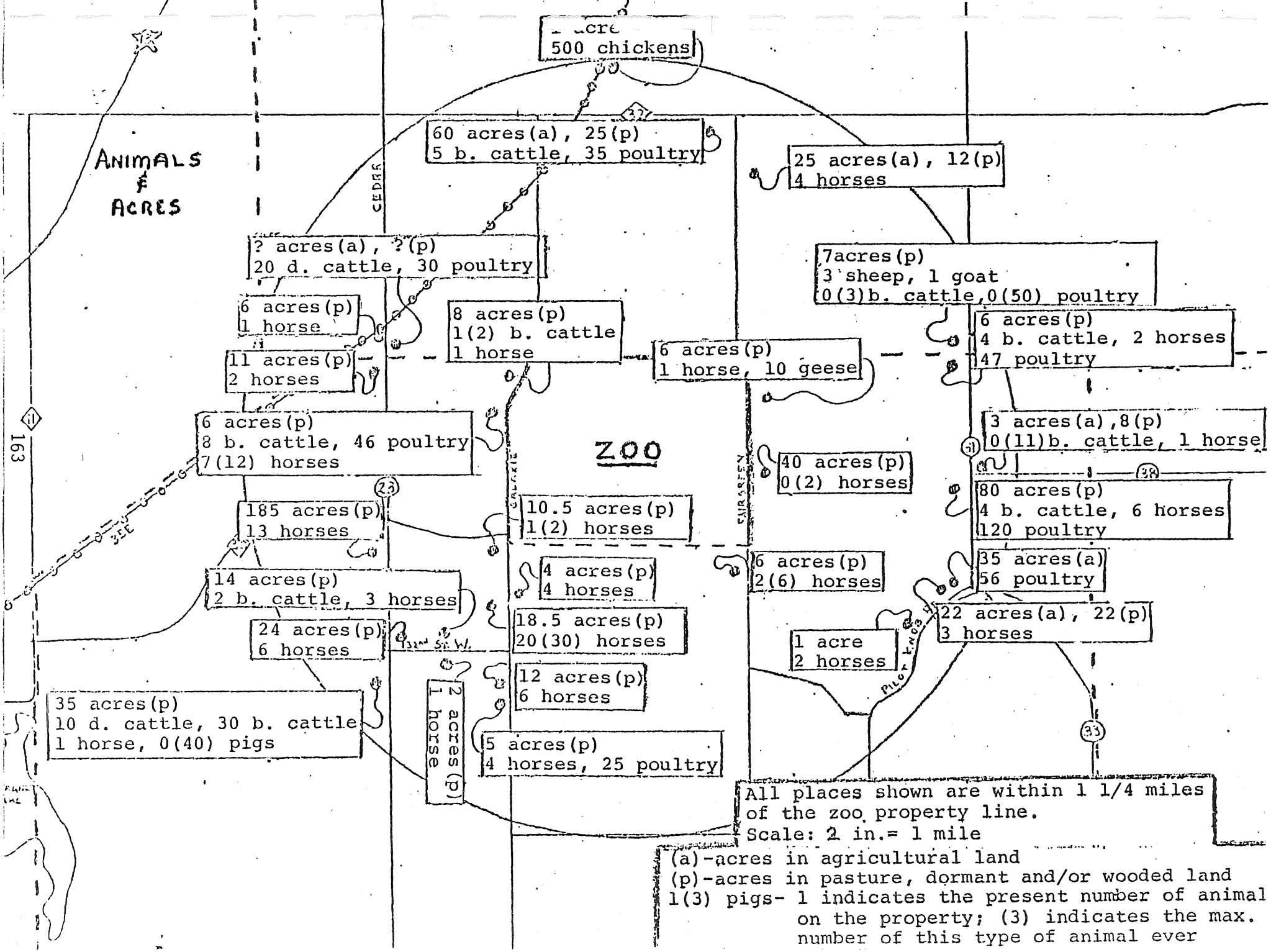
There is a large number of animals present inside the three mile area around the zoo. They exist on farms or on residential home sites. Many people moved out there so that they could keep animals and this is seen in the great number of homes that have horses, poultry, cattle, etc. On the other hand agriculture is slowly dying in this area because of it's development. There are not a great number of farms or the coinciding number of farm animals present in these communities. Most animals are concentrated on the "hobby farms" of the area. To find high concentrations of farm animals, one must look outside a 2 mile radius from the zoo, where most large farms are located. These larger commercial farms are present outside a 2 mile radius in all directions except west to Burnsville. The owners of small numbers of animals are scattered in all the areas and in many cases are hard to detect.

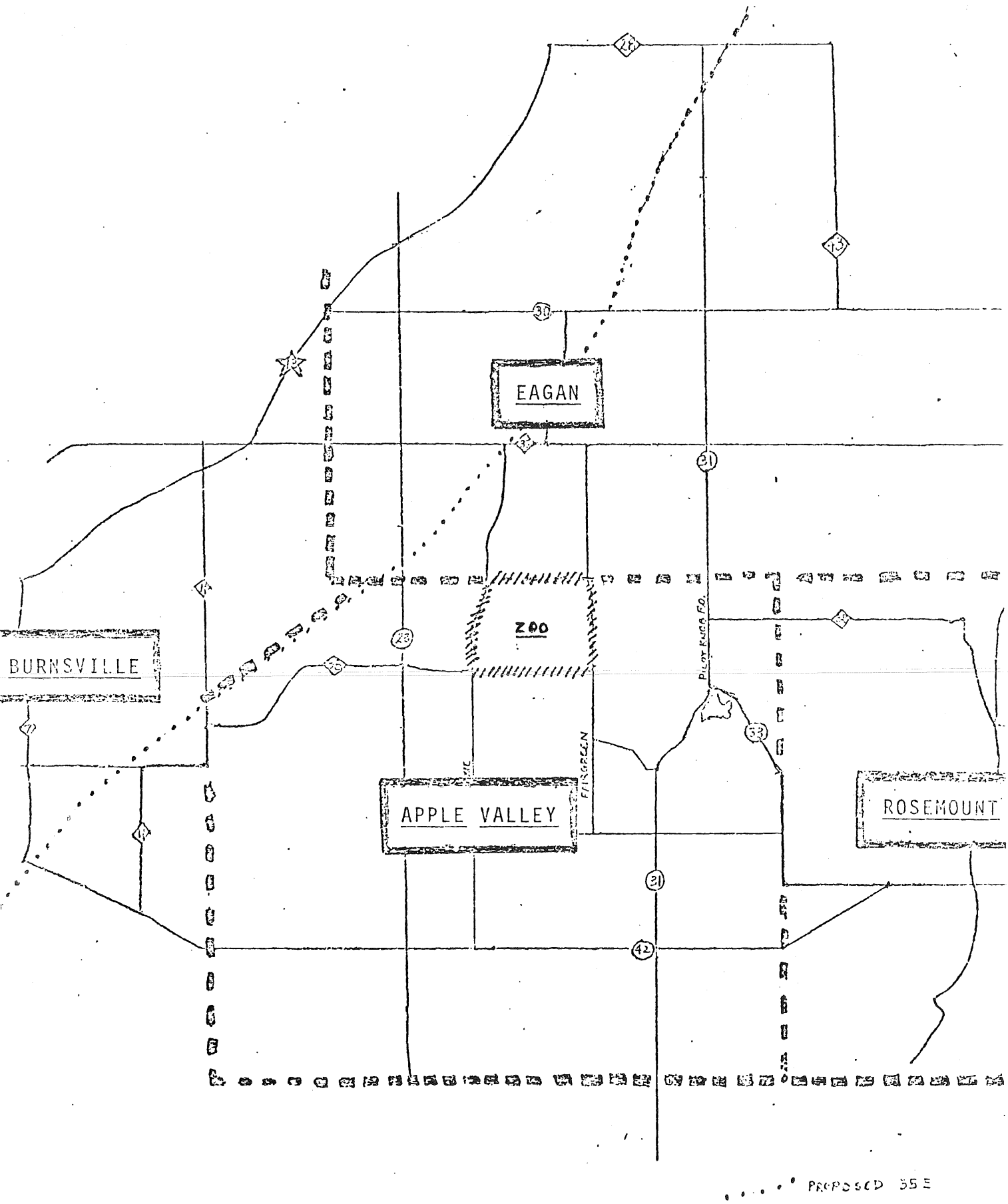
The trend in farms of this area is toward leasing or renting land from the land companies or other land holders because farmers cannot afford the taxes on the land. The high cost of farming and maintaining large tracts of land are forcing many of these farmers to sell out. High taxes and assessments are also making it harder for "hobby" farmers to contunue because of the rising cost of living in this area. Another factor which has just begun to make itself felt is the high cost of feed. Many people indicated they would cut the number of animals they kept if feed continued to rise in price. It is hardly profitable to raise animals or keep pets with the escalating cost of feed.

Future changes in the zoning of these areas is very much open. A great deal of land is zoned agricultural or agricultural-residential in these communities, although Burnsville is completely zoned and variances must be obtained for zone changes. The other three communities have alot of undeveloped land. As of this time none of these areas except Apple Valley see any short range chances of zoning changes and these are indicated on one of the maps. At this time Eagan is considering a new land use plan but it is still being considered.

The plans for the future of this area preclude any farming in the area. Although this development may be 20 or 30 years distant the signs of this trend are present today. This is evident in the land use plans now being followed by each community. No provision is made for any farming.

On the following pages are a number of maps illustrating and displaying the results of my study. There is also a large map and index from which all pertinent data may be gathered.


ANIMALS & ACRES
ZOO
- acre
500 chickens
60 acres(a), 25(p)
5 b. cattle, 35 poultry
25 acres(a), 12(p)
4 horses
? acres(a), ?(p)
20 d. cattle, 30 poultry
7acres(p)
3 sheep, 1 goat
0(3)b. cattle,0(50) poultry
6 acres(p)
1 horse
8 acres(p)
1(2) b. cattle
1 horse
6 acres(p)
1 horse, 10 geese
6 acres(p)
4 b. cattle, 2 horses
47 poultry
11 acres(p)
2 horses
6 acres(p)
8 b. cattle, 46 poultry
7(12) horses
3 acres(a),8(p)
0(11)b. cattle, 1 horse
40 acres(p)
0(2) horses
80 acres(p)
4 b. cattle, 6 horses
120 poultry
185 acres(p)
13 horses
10.5 acres(p)
1(2) horses
6 acres(p)
2(6) horses
35 acres(a)
56 poultry
4 acres(p)
4 horses
14 acres(p)
2 b. cattle, 3 horses
18.5 acres(p)
20(30) horses
22 acres(a), 22(p)
3 horses
24 acres(p)
6 horses
1 acre
2 horses
12 acres(p)
6 horses
35 acres(p)
10 d. cattle, 30 b. cattle
1 horse, 0(40) pigs
2 acres(p)
1 horse
5 acres(p)
4 horses, 25 poultry
163
CEDAR
GALAXIE
SUNSET
PILOT KNOB
32nd St W.
All places shown are within 1 1/4 miles of the zoo property line.
Scale: 2 in.= 1 mile
(a)-acres in agricultural land
(p)-acres in pasture, dormant and/or wooded land
1(3) pigs- 1 indicates the present number of animal on the property; (3) indicates the max. number of this type of animal ever


EAGAN
BURNSVILLE
APPLE VALLEY
ROSEMOUNT
ZOO
PILOT KNOB RD.
FIRSTREAN
PROPOSED 35E

ZONING CODES

Apple Valley

R1- One Family Residential

R2- Two Family Residential

R3- Multiple Family Residential

RCL- Residential Cluster

M1- Townhouses

M2- Multiple Family Residential- For areas with direct exposure to single family homes or the preservation of irregular terrain, an unusual number of trees or other natural features that will restrict the location of buildings and parking lots and consequently permit only a low density development.

M3- Multiple Family Residential- Areas where exposure to single family homes or irregular terrain or preservation of natural features will somewhat restrict development, however not to the extent described in the M2 district.

M4- Multiple Family Residential- For areas where level terrain, proper separation from single family homes, direct access to major arterials and similar features will allow a dense multiple residential development and high-rise buildings.

B1- Limited Business District

B2- Neighborhood Business District

B3- General Business District

B4- Village Center District

B5- Regional Shopping District

B6- Visitors Service Area

B7- Airport District

I1- Limited Industrial

I2- General Industrial

Burnsville

R1- One Family Residential

R2- Two Family Residential

R3- Multiple Family Residential

B1- Limited Business

B2- Neighborhood Business

B3- General Business

B4- Shopping Business

I1- Linited Industrial

I2- General Industrial

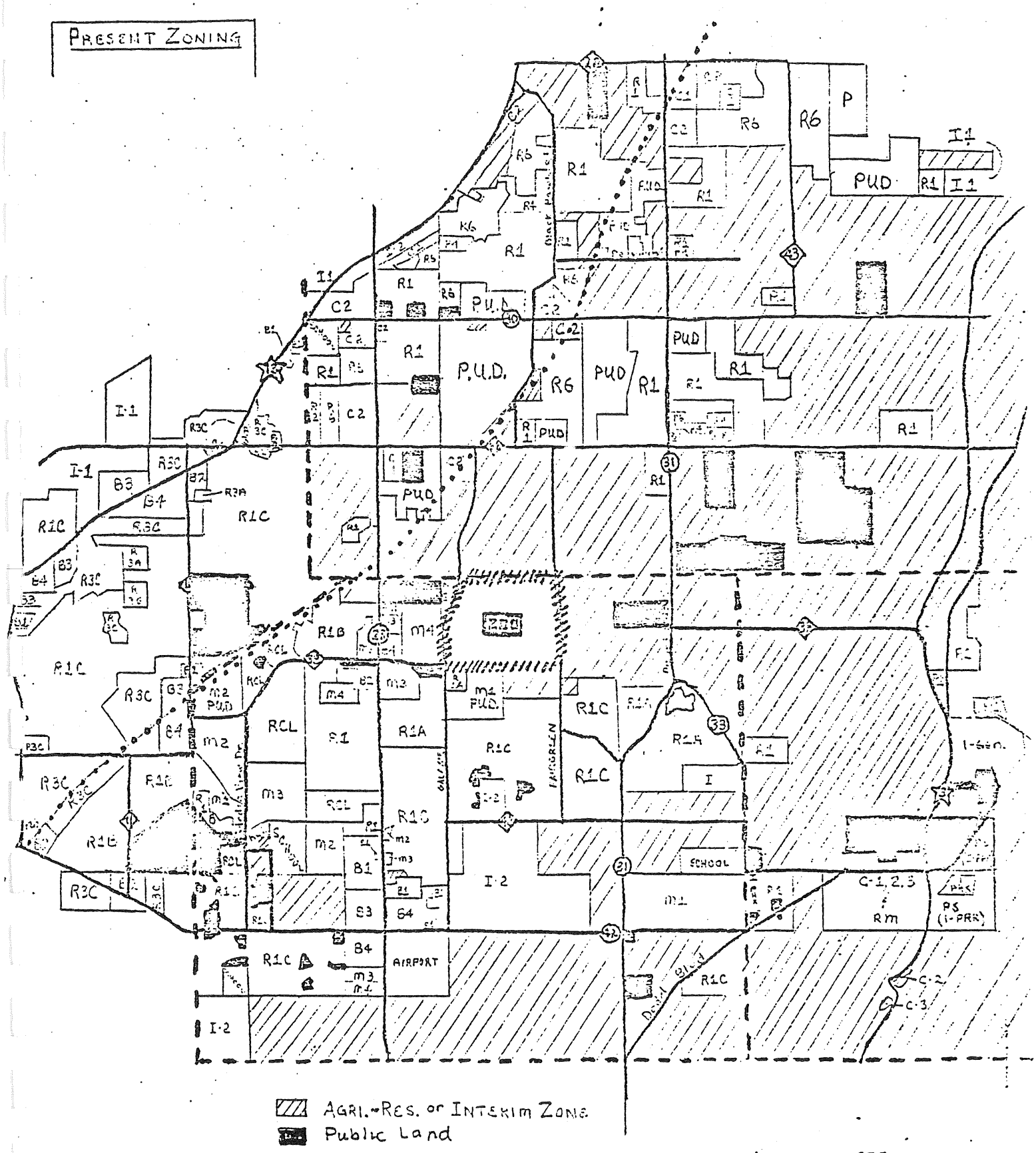
I3- Industrial Park

Eagan

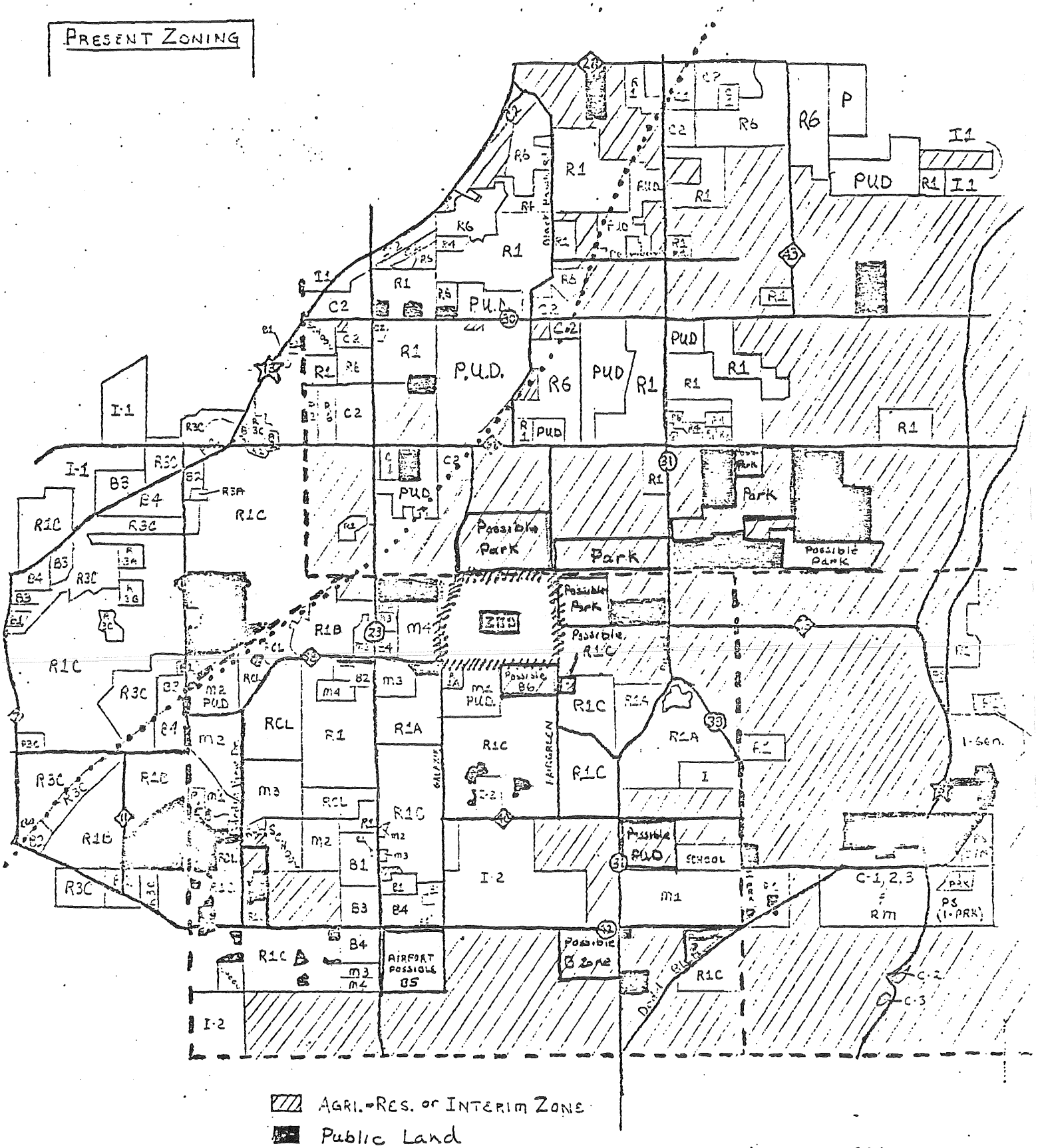
R1- Residential Urban (SFR)
R2- Residential Double
R3- Residential Fourplex
R4- Residential Townhouse
R5- Residential Medium Multiple
R6- Residential Multiple
C1- Light Commercial
C2- Heavy Commercial
I1- Light Industrial
I2- Heavy Industrial
R&D- Research and Development
P- Public Facilities
A- Agriculture
PUD- Planned Unit Development

Rosemount

R1- Single Family Residential
RM- Multiple Residential
C1- Neighborhood Commercial
C2- Community Commercial
C3- Highway Commercial(Service)
I-Gen- General Industrial
I-Prk- Industrial Park
Pub- Public or Quasi-Public
Ag- Agriculture
PS- Plan Study


PRESENT ZONING
AGRI.-RES. or INTERIM ZONE
Public Land
PROPOSED 35E
8/19/74

PRESENT ZONING



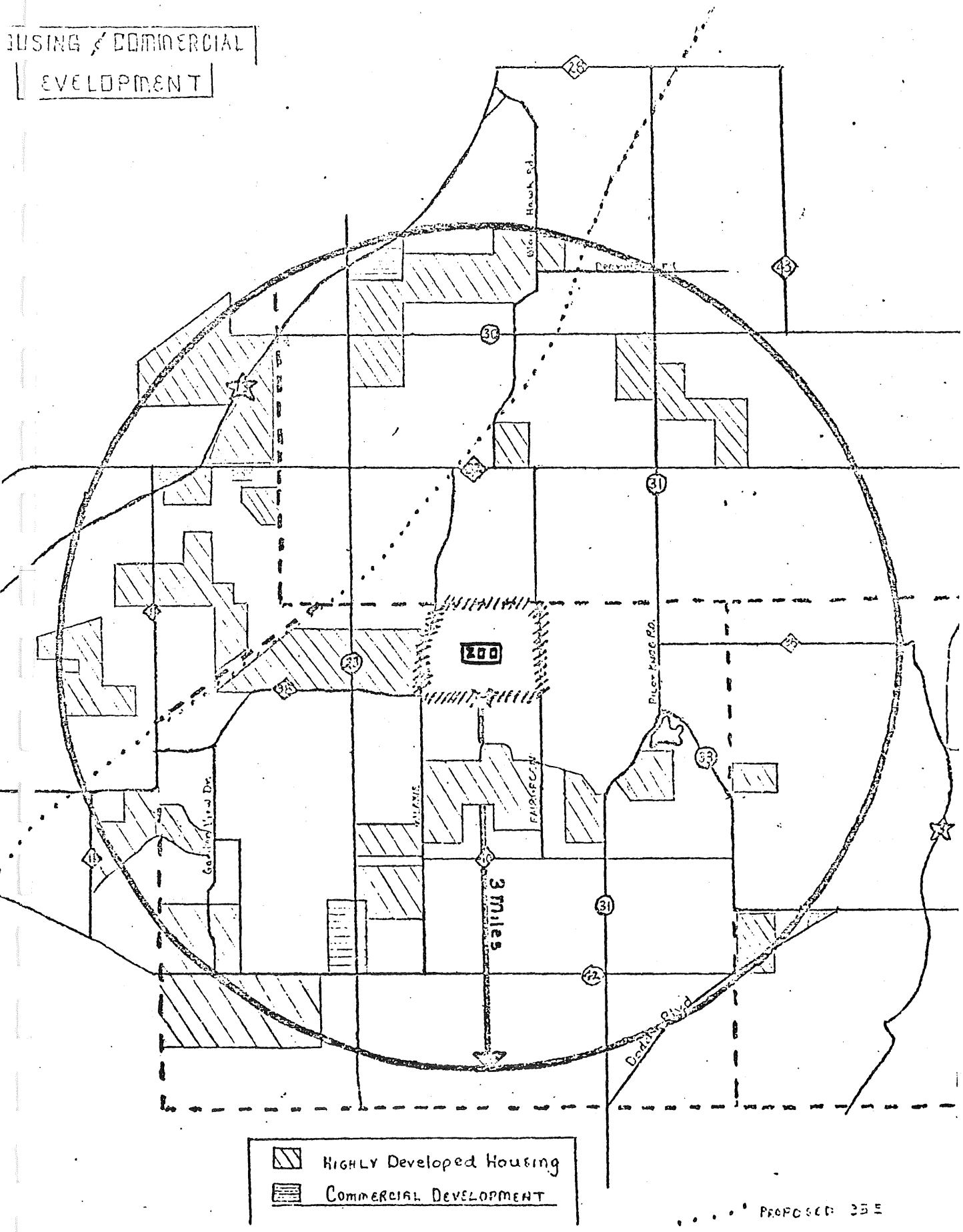
AGRI.-RES. OR INTERIM ZONE

PUBLIC LAND

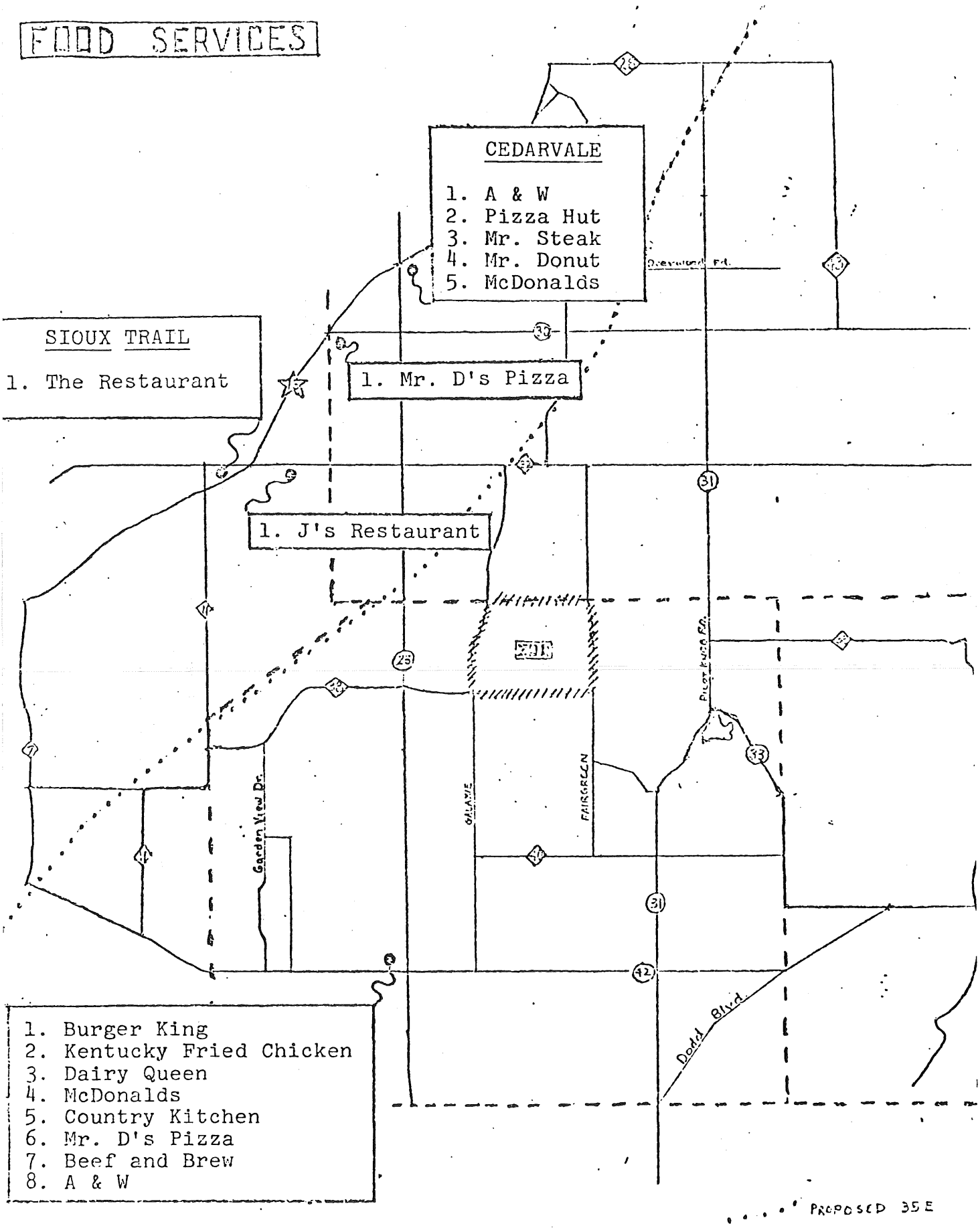
PROPOSED SSE

These are general areas of possible short range zoning changes. Some of the park land has been acquired (Park) while other segments have funds but have not been purchased (possible park). In any case, these areas have not been zoned as parks yet.

8/19/74


USING & COMMERCIAL
EVELOPMENT
ZOO
3 Miles
Highly Developed Housing
Commercial Development
PROPOSED 35

FOOD SERVICES



This survey is a general study of the captive animal population of a 3 mile area around the zoo. It is possible there are deletions because of the difficulty of locating land with animals. I do believe though, that any animal concentrations of any consequence have been mapped and noted.

It is also hard to locate all of the farmers because of the wide spread leasing of land. There are some fields I could not come up with owners for, but this is the exception rather than the rule(most of these have been noted also).

I do beleive this report to be an accurate description of the community animal population.

DAKOTA COUNTY TRIBUNE, FARMINGTON

WK OF AUG 2 6 1974

ACCESS ROAD, STACKING SPACE IMPORTANT--

Report Concludes Zoo Will Have Little Effect On AV

By CAROL BRAUN
Staff Writer

APPLE VALLEY - - Problems to the city of Apple Valley resulting from the location of the new Minnesota Zoological Gardens within its boundaries should not be as significant as once imagined. That is the final conclusion drawn by city officials and staff after visiting a selection of major zoo facilities across the United States.

The conclusions outlined in the final report presented to the city council recently for the most part back up tentative conclusions presented earlier this summer after only two zoo sites had been visited.

The sites described in the earlier report were the Metro-Toronto Zoo, Toronto Canada, visited by John Gretz, city public works director, and Richard Asleson, city administrator, and the Warner Brothers Jungle Habitat in West Millford, N. J., visited by Gretz, Asleson and Willis Branning, Apple Valley councilman.

Since then, the final visits were made by Asleson to the Phoenix, Arizona zoo June 25 and by Asleson and Mayor Fred Largen to the San Diego Zoological Garden and the San Diego Wild Animal Park June 26 and to Lion Country Safari in Laguna Hills near Los Angeles June 27.

One of the major conclusions of both the preliminary and final report was, with the up-grading of the main access road to the zoo (County Road 38) to four lanes and eventual improvements to the northern segments of Galaxie and Fairgreen Avenues, the roads should be able to handle the traffic to the zoo. From the information in the report, similar road situation at the other zoos were able to accommodate atten-

(Continued On Page 12A)

dance levels much like those predicted for the Apple Valley facility.

Another conclusion set out in the report was it will be very important to allow enough stacking space between the ticket booths and the entrance to the zoo and County Road 38, so traffic does not back up on the access road.

A very important observation made at each of the zoos was that the facilities have very little effect on the city police and fire departments. According to Asleson, Apple Valley originally expected to have to increase police and fire protection as a result of the zoo.

However, that has not been the case in the cities where the other zoos are located. Officials in these cities attribute the lack of significant problems to the family nature of the attractions. The Phoenix Zoo has had only one fire call in eleven years. The San Diego Zoological Gardens averages 30 medical emergencies per year.

According to the report, the question of how internal security will be handled should be coordinated with the State Zoological Board. The Apple Valley Police Department will need to consider the zoo a responsibility along with other expanding needs of the city, but there will probably be no need to greatly increase the size of the police force when the zoo opens. "We'll need to be aware that it's there," Asleson said, "but we don't have to jump off the deep end."

In terms of geographic relationship to a metropolitan area, the West Millford Zoo and the Metro-Toronto Zoo are the most similar to the Minnesota Zoological Gardens, the report said. It is difficult to draw some comparisons between the Apple Valley Zoo and the west coast zoos because in San Diego, one zoo is in the heart of the city and Wild Animal Park is in the middle of a large open area, and Lion Country Safari in Los Angeles has almost direct competition from Disneyland.

All the zoos visited have fast food, snack and restaurant facilities within the zoo itself. Some of the facilities run their own food services and others have brought in franchise food operations. Internal food facilities at the Minnesota Zoological Gardens will be up to the zoo board, the report said; however, indications are that on-site eating facilities have been planned for the Minnesota Zoo.

According to the report, the demand for external zoo-related commercial development will probably not be as great as Apple Valley once thought. None of the zoos visited appeared to have resulted in significant commercial growth, which apparently results from the one-day-stop, family nature of the zoos, officials said.

However, Apple Valley officials believe the zoo will need and be able to support a limited amount of service commercial development such as service stations and motels. The city is also examining the possibility of a campground near the site. The Warner Brothers Jungle Habitat in West Millford is located near a KOA Kampground and the business at that facility did expand notably after the zoo opened.

The city staff had been authorized by the city council to visit a number of zoo sites using city funds. Officials explained the visits were planned in conjunction with other trips already scheduled. For example, the San Diego zoos were visited while Mayor Largen was in that city attending the national mayor's conference.

Copies of the report as well as slides taken on the trips are available at the city hall to be viewed by any interested party.

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APPENDIX 17

Projected Attendance for the Days of the Year for the Minnesota Zoological Garden's First Year of Operation

Month	Day	Daily Attendance	Monthly Attendance
January	weekday	400	
	weekend	1,000	18,200
February	weekday	400	
	weekend	1,100	
	Presidents' Day	33,000	50,700
March	weekday	1,300	
	weekend	3,200	
	week of school spring vacation	16,000	128,400
April	weekday	2,400	
	weekend	6,000	109,100
May	weekday	5,600	
	weekend	13,000	
	Memorial Day	48,400	275,400
June	weekday	6,300	
	weekend	14,700	
	June peak day	31,500	272,900
July	weekday	7,500	
	weekend	17,500	
	July peak day and Independence Day	37,400	382,000
August	weekday	8,500	
	weekend	19,900	
	August peak days	42,600	400,200
September	weekday	3,600	
	weekend	8,300	
	Labor Day	44,900	190,800
October	weekday	2,000	
	weekend	5,100	
	Teachers Convention	21,400	129,700
November	weekday	900	
	weekend	2,200	
	Friday after Thanksgiving	38,900	74,500
December	weekday	400	
	weekend	1,000	
	week after Christmas	12,500	90,100