

Erie Zoo Master Plan

2010 - 2020

Erie, Pennsylvania

Penn State Architecture
Third Year Design Studio

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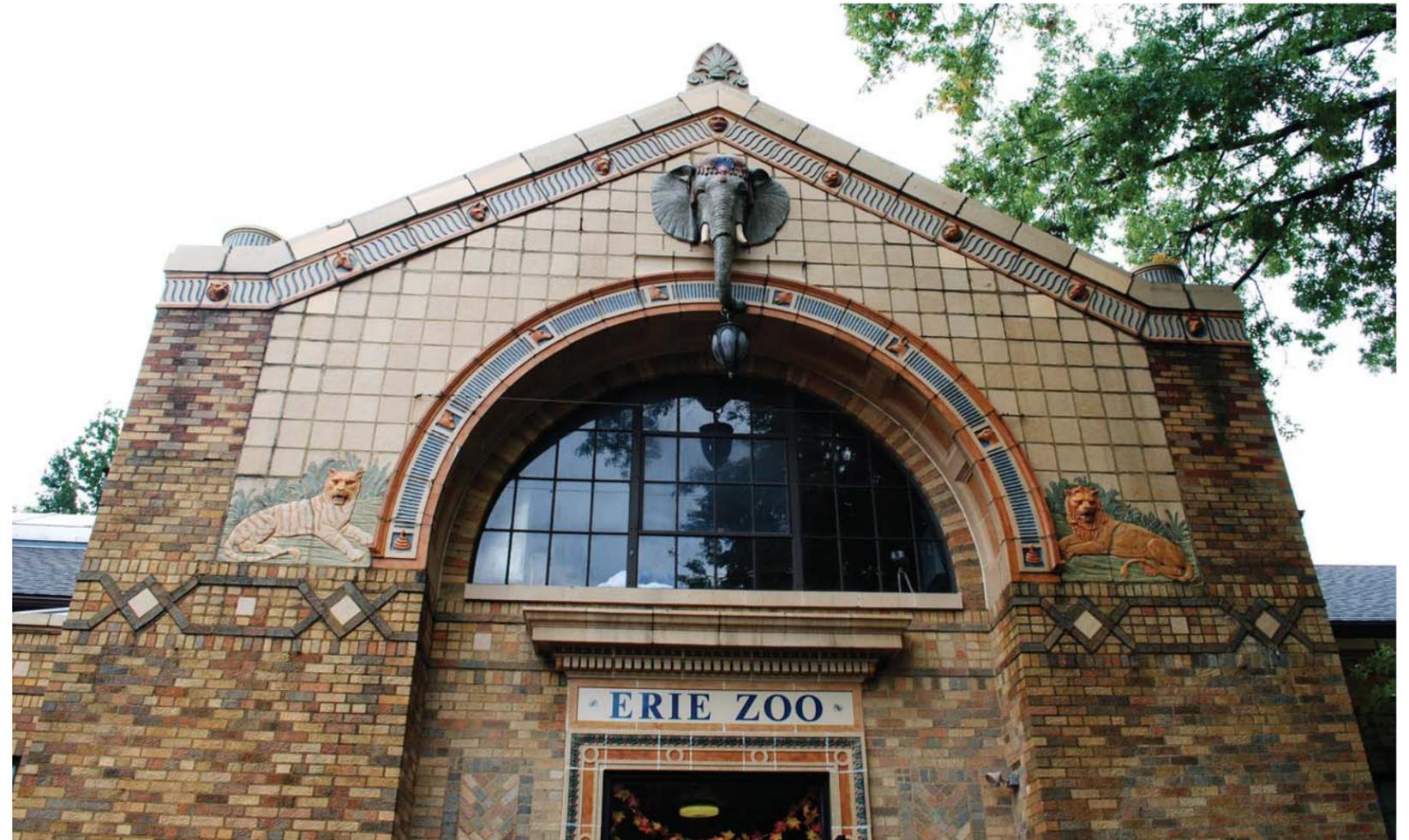
Executive Summary

Created by the Pennsylvania State University third year architecture student studio, the Erie Zoo Master Plan provides a blueprint for the next ten years of the Erie Zoological Society based upon their mission statement. The mission of the Erie Zoological Society is to foster an appreciation of the natural world, establish educational and recreational opportunities, and nurture the thrill of discovery for all ages. It also aims to promote scientific study for people of all ages, provide the highest level of care for all aspects of the zoo, and encourage the conservation of all species through captive breeding, natural exhibits, and wildlife exploration.

An inventory of the existing Erie Zoo was created to identify the current conditions at the Zoo, to establish the goals of the Zoo and its staff, and to analyze areas of potential. Areas of potential reside in exhibit design, possibilities of expansion, and revenue generation.

This plan is meant to address the changing needs of the Erie Zoo over the next ten years. Although each item is recognized as a specific need or proposal, the importance and sequence of each section may change based on the availability of species, funding, or any specific needs of the Erie Zoo.

The Erie Zoo Master Plan is separated into two parts. The first section is a combination of research and analysis of data from the existing Erie Zoo Plan. The second section consists of the proposal, which includes a possible plan for expansion and smaller improvements throughout the Zoo.



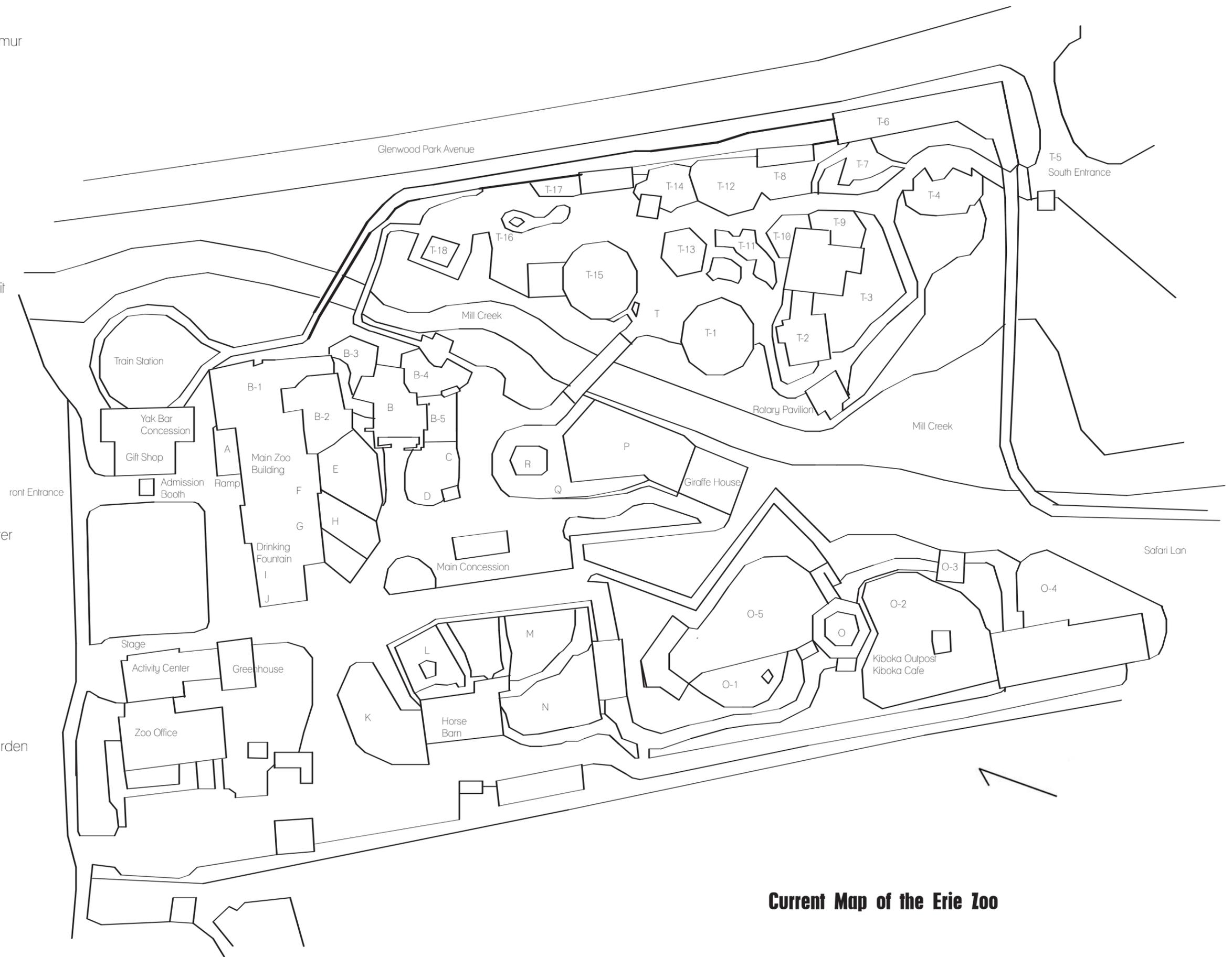
Zoo Evaluation



Master Plan Goals

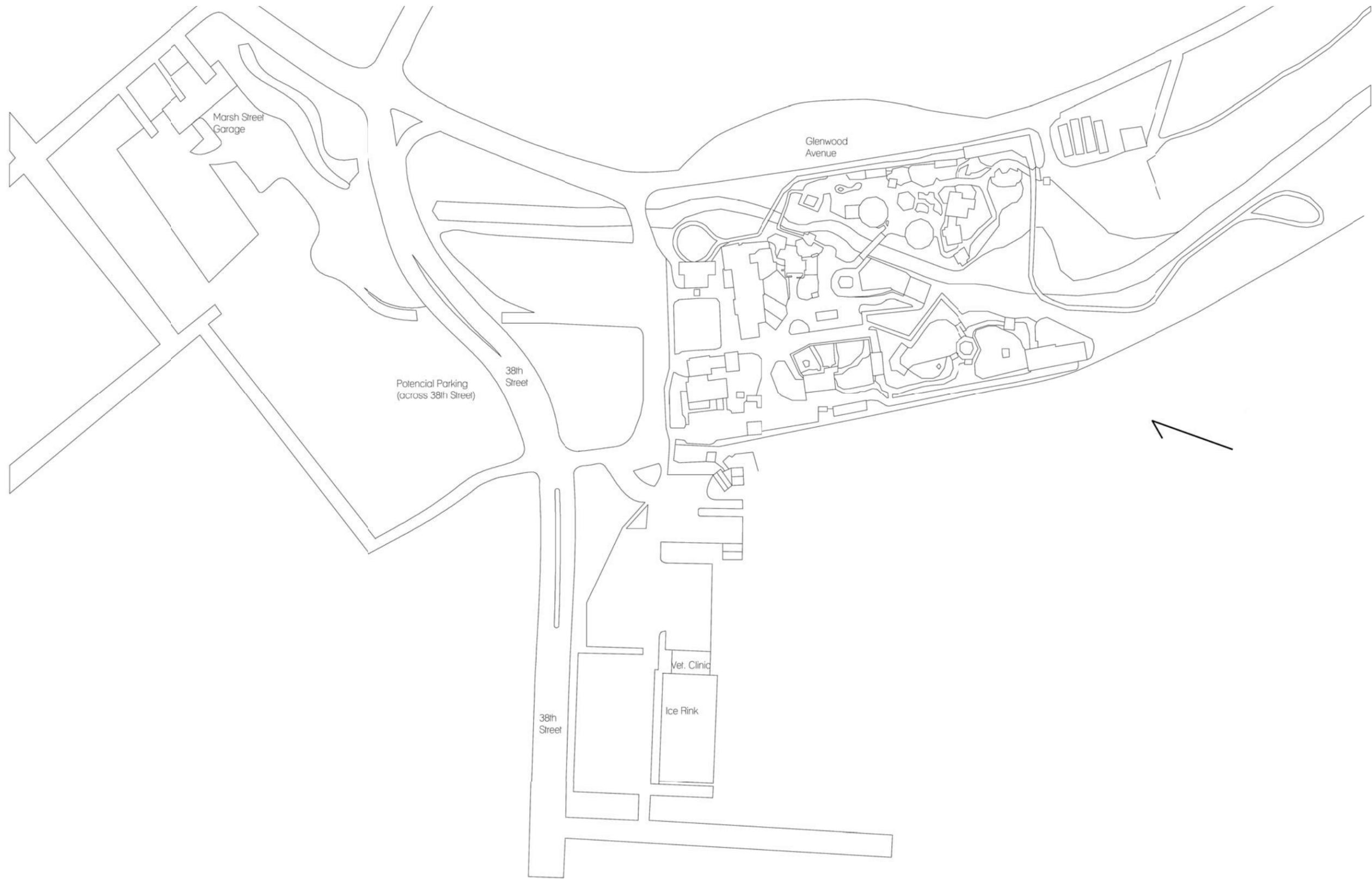
- + Sustain the zoo
 - + Acquire space to improve current situation without expanding
 - + Maintain standing within community and relationship with members
- + Stress the importance of animal well being
- + Facilitate new opportunities for income year round
- + Update technology
 - + Implement new strategies to manage animal care and zoo maintenance
- + Increase Efficiency
 - + Improve entrance and circulation throughout zoo
 - + Rework concession area and provide more seating
 - + Organize and consolidate maintenance
- + Create adaptable exhibits that are appropriate for a variety of species

- A Red Ruffed Lemur
Black & White Ruffed Lemur
- B Wild Asia
 - B-1 Orangutan
 - B-2 Siamang
 - B-3 Muntjac
 - B-4 Asian Reptiles
 - B-5 Red Panda
- C Tamarin
- D Pallas Cat
- E Lowland Gorilla
- F Grivet Monkey
- G Naked Mole Rat
- H Leopards/Jaguars
- I Meerkat, Rock Hyrax
- J African Waterbirds Exhibit
- K Horse
- L Polar Bear
- M African Lion/Cats
- N Amur Tiger
- O Kiboka Outpost
 - O-1 Warthog
 - O-2 White Rhino
 - O-3 The "Hide"
 - O-4 Zebra
 - O-5 African Dogs
- P Reticulated Giraffe
- Q Australian Black Swan
- R Spider Monkey
- S North American River Otter
- T Children's Adventure
 - T-1 Wildlife Carousel
 - T-2 Wings of Wonder Aviary
 - T-3 Australian Walkabout
 - T-4 Mystery Mountain
 - T-5 South Entrance
 - T-6 Train Tunnel
 - T-7 Wild Things Theater
 - T-8 Llamas
 - T-9 Donkey
 - T-10 Zebu
 - T-11 Children's Adventure Garden
 - T-12 Critter Encounter
 - T-13 Concession Building
 - T-14 Gator Bayou
 - T-15 Adventure Center
 - T-16 Play Area
 - T-17 Penguin Coast
 - T-18 Play Area



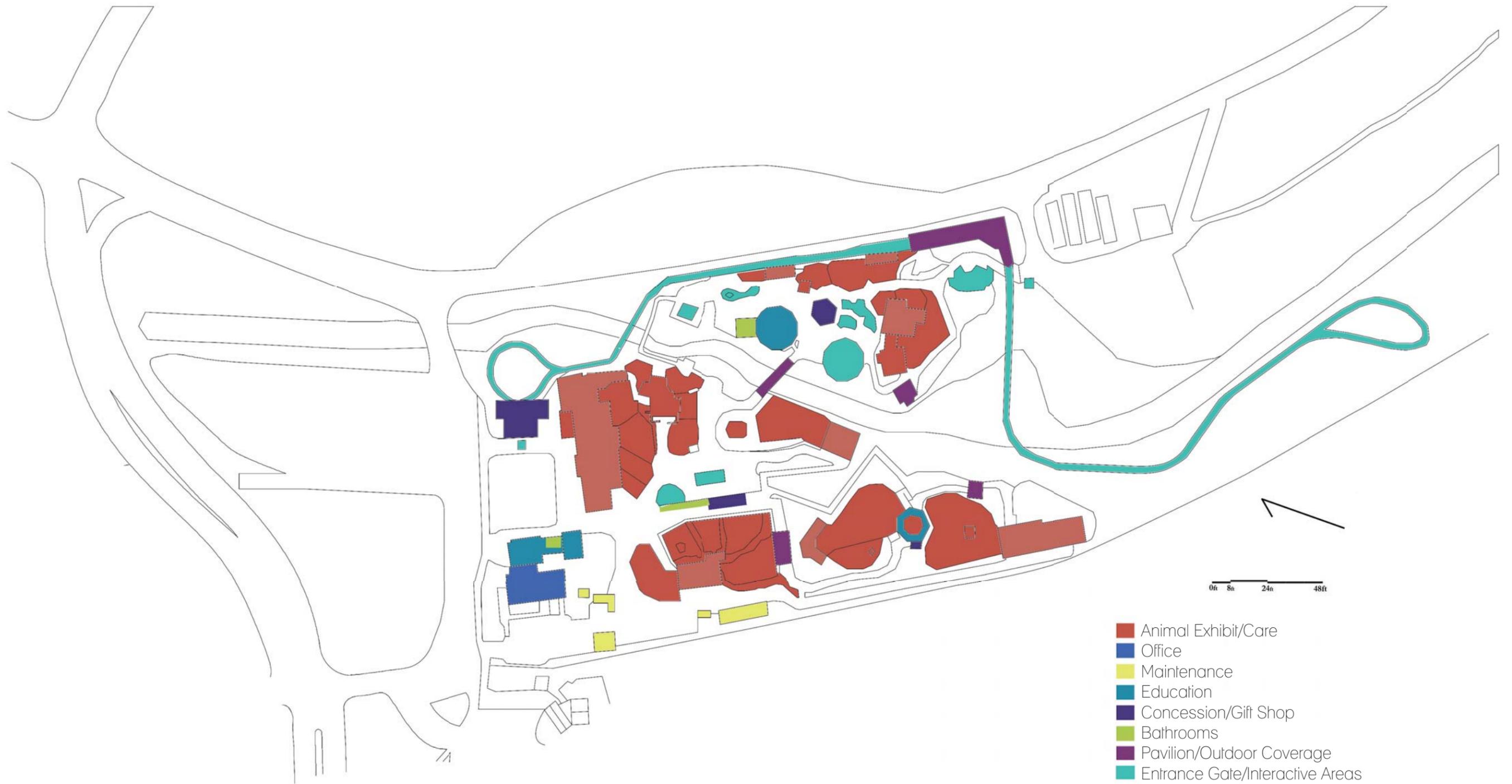
Current Map of the Erie Zoo





Current Map with Surrounding Areas





Space Usage

Diagramming the current uses for the existing buildings and zoo holdings, it was found that the majority of land use is dedicated to animal exhibits and holding areas. The bathrooms and concessions are inadequately spaced. In addition, the maintenance is inefficiently organized and sized. The gift shop and concessions also need to be larger and incorporate indoor spaces.

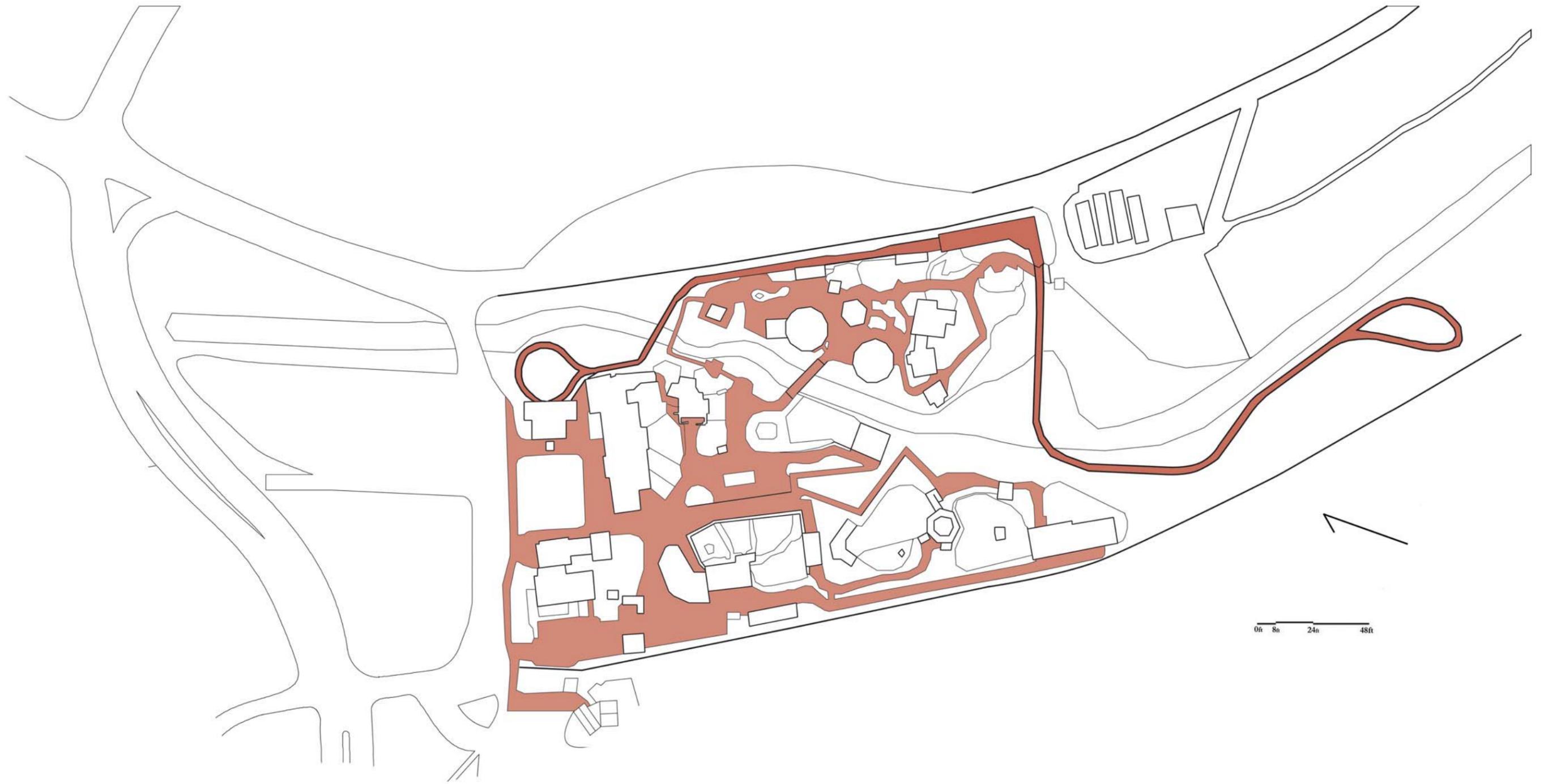


Inventory



Exhibit Conditions

Exhibits were evaluated and ranked according to their current aesthetic appearance and desire for general maintenance. The exhibits placed in the lowest category were typically too small for the current animals, dated, or in need of repairs. Exhibits in the highest category typically were the most admired amongst visitors or were recently reconstructed. The areas in red, which are classified as most critical for updating, include the existing polar bear exhibit, the zebra enclosure, the otters, and the cat area. This also includes the existing main entrance, gift shop, and train station.



Circulation

This map illustrates the concentration of pathways and connections within the zoo, as well as the train route. Some intersections are very large and could be causes of congestion or confusion. ADA circulation was found throughout the Zoo. The adjacency of the pathways to the exhibits allows for an intimate experience with the animals.





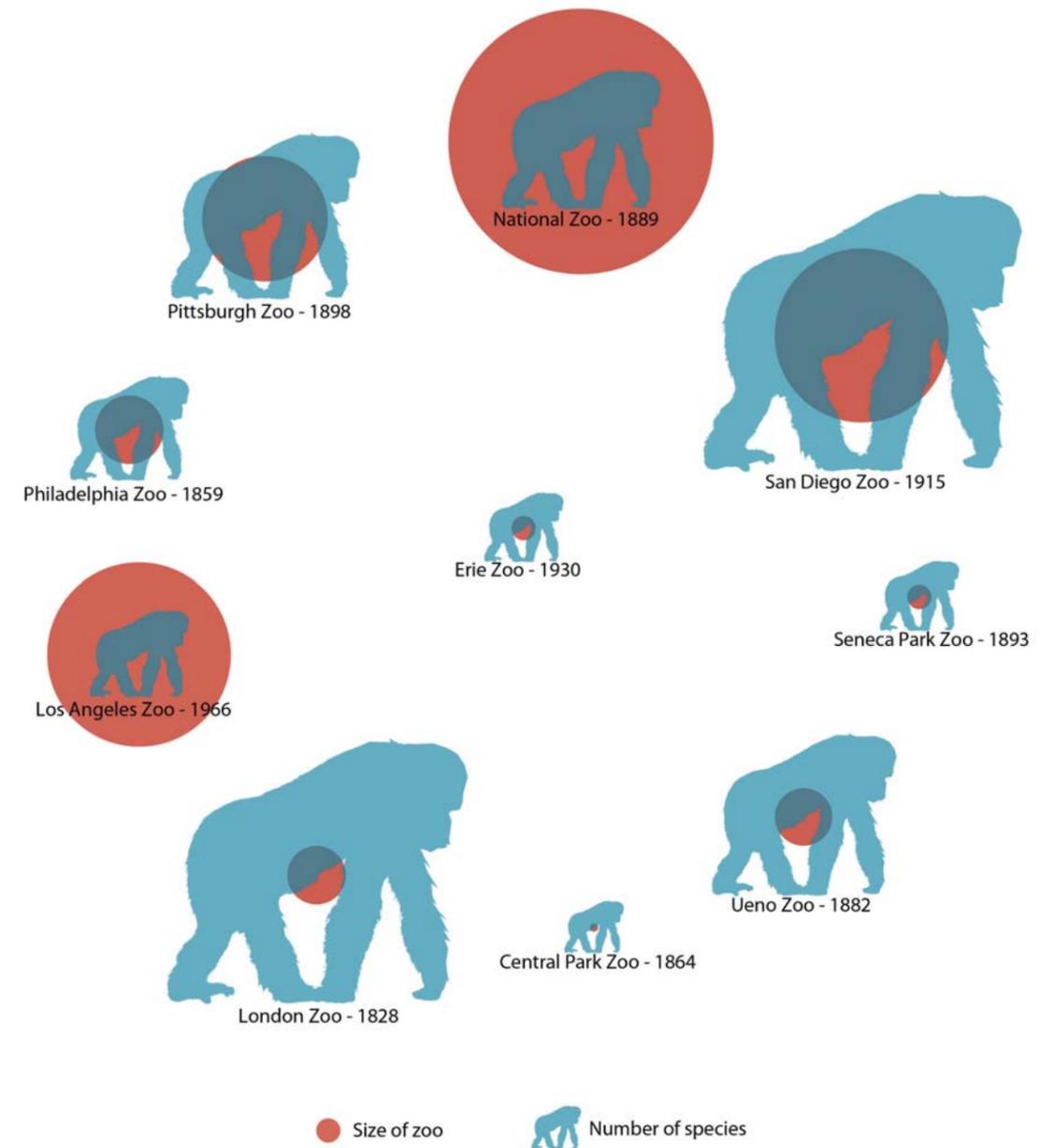
Points of Visual Interest

This is representative of current points of visual interest within the zoo. These areas represent views that become part of the zoo's narrative and allow visitors to see multiple parts of the zoo at once. It also shows key areas, such as the entrance and the children's zoo, and how a visitor would be viewing it.



Erie Zoo Animal List:

- African Lion
- Alligator
- Australian Black Swan
- Aviary Bird
- Belgian Draft Horse
- Black and White Ruffed Lemur
- Cheetah
- Donkey
- Grivet Monkey
- Jaguar
- Kangaroo
- Leopard
- Llama
- Lowland Gorilla
- Meerkat
- Muntjac
- Naked Mole Rat
- North American River Otter
- Orangutan
- Pallas Cat
- Penguins
- Polar Bear
- Red Panda
- Red-Ruffed Lemur
- Reticulated Giraffe
- Siamang
- Spider Monkey
- Tamarin
- Warthog
- White Bengal Tiger
- White Rhino
- Zebra
- Zebu



Zoo Comparison

Illustrating the comparison of zoos around the world, each zoo's size and number of species are represented proportionally. Given the small scale of the Erie Zoo, the diagram shows the large density of animals in proportion to its size.



Current 2010 Calendar Of Events

-  Opening Day
-  Spring Egg- Venture Egg Hunt
-  Cat Nation Cat Show/ Erie Zoo Art Show
-  Erie Zoo Parade
-  Healthy Zoo, Healthy You Family Day
-  Equipment Day
-  Members Day
-  Garden Conservancy Program
-  GalapaZOOza
-  Frozen Safari
-  Senior Citizen Day
-  McDonalds Day
-  Clown Day
-  Family Fun Run
-  WQLN Kid's Club Day
-  ZooBoo
-  Last Day of Zoo Season
-  Zoo Closed

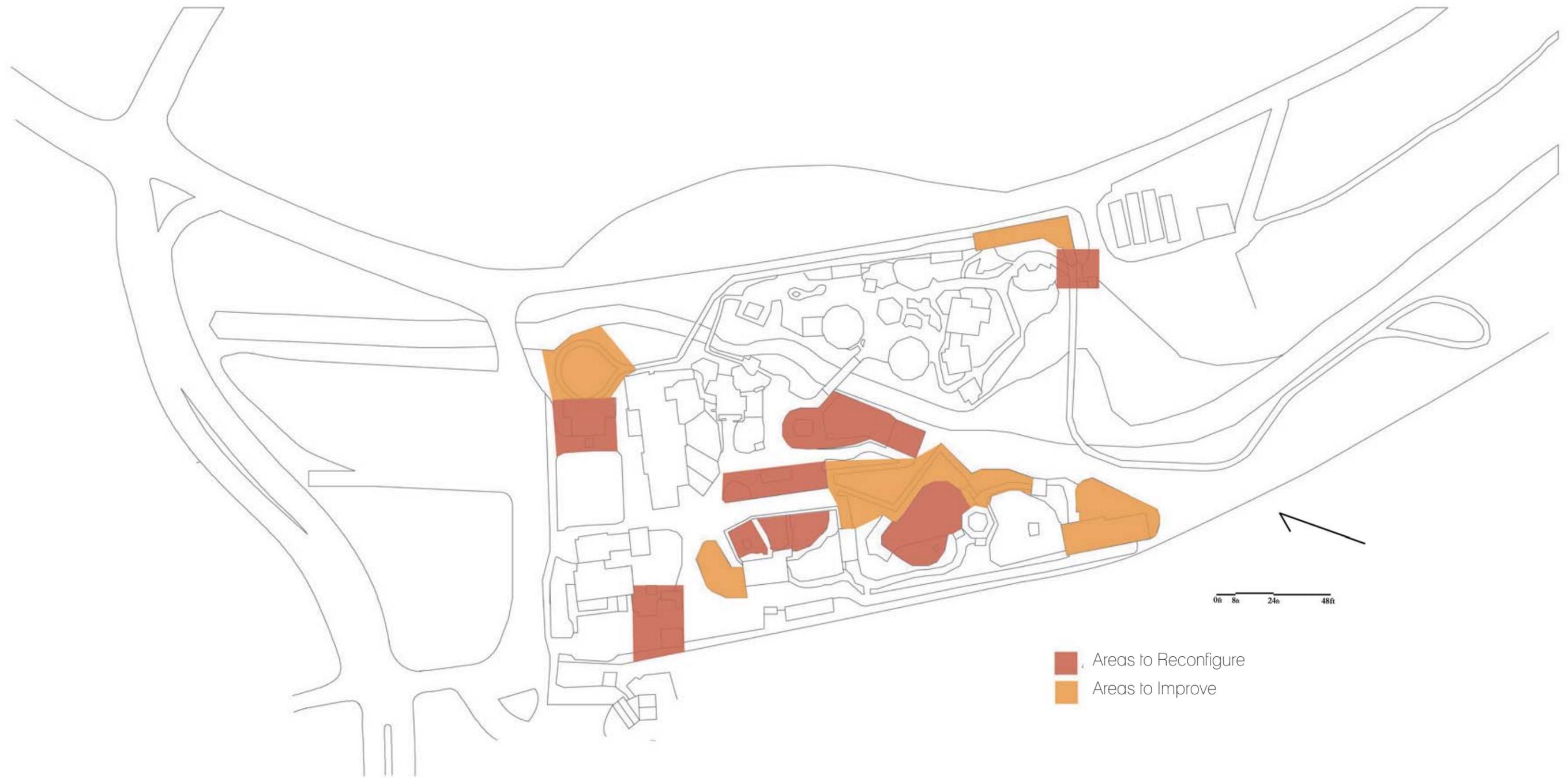
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October							November							December						
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31																				





Zoo Areas of Potential

Various areas within the zoo have a large potential for updating or reprogramming based on their location and current state. The reconfiguring of the entrances, current polar bear exhibit, and cat exhibit could give the Erie Zoo a fresh presence within the community. Other areas designated in orange, such as certain circulation pathways, the concession area and train stations have the potential to improve the visitors' zoo experience.



Potential of Outlying Areas

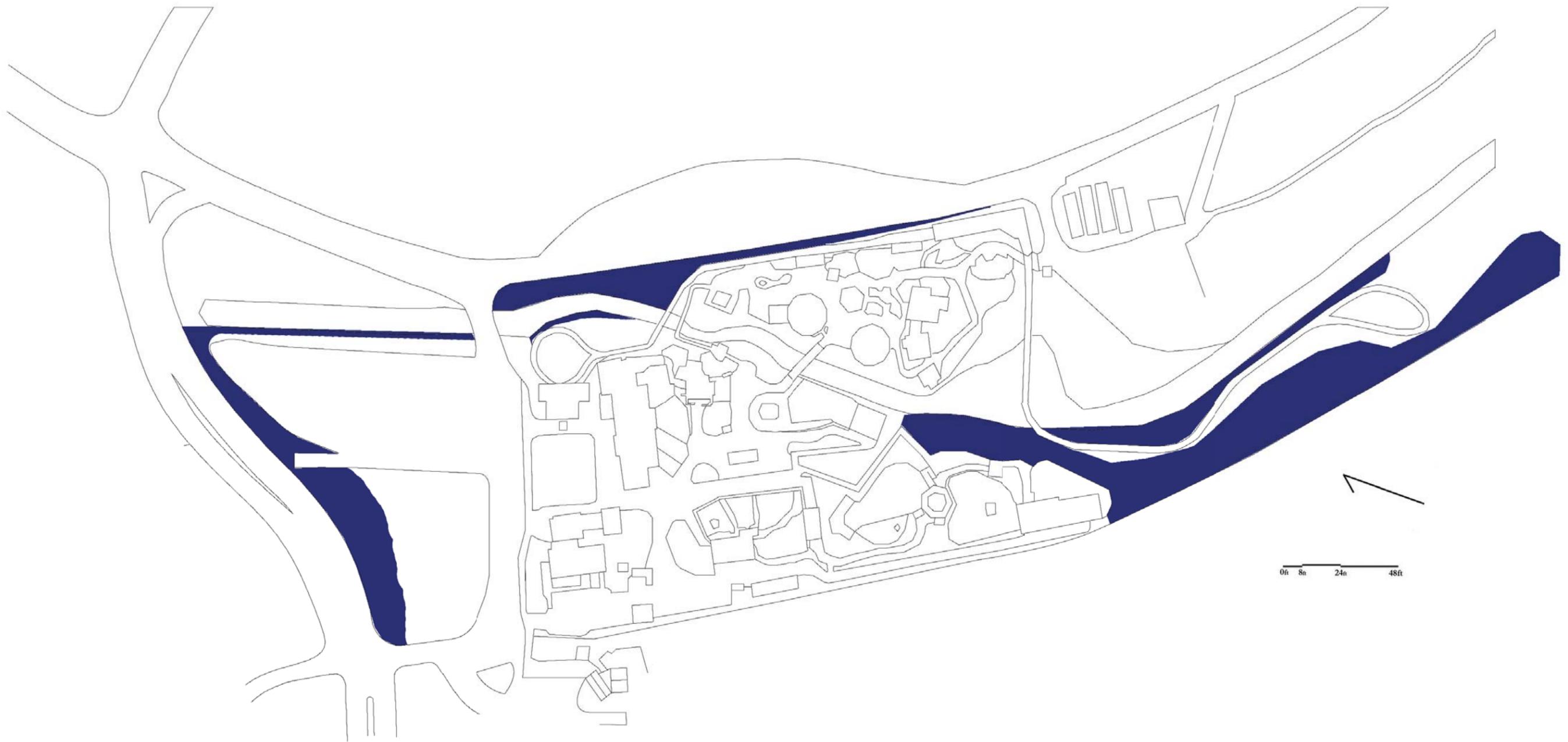
The prospective land acquisition of two properties adjacent to the current boundary could lead to zoo expansion. As undeveloped land (in blue), the property pieces have great potential, but also draw backs such as their disconnected location across major roadways. The land currently owned by the zoo (highlighted in purple) could be reprogrammed to better suit the zoo's modern needs.



The tree coverage of the Erie Zoo is most dense in the areas of unusable land, such as the land that surrounds the river. This pattern of density creates an axial line through the zoo that can be carried through in the new masterplan.

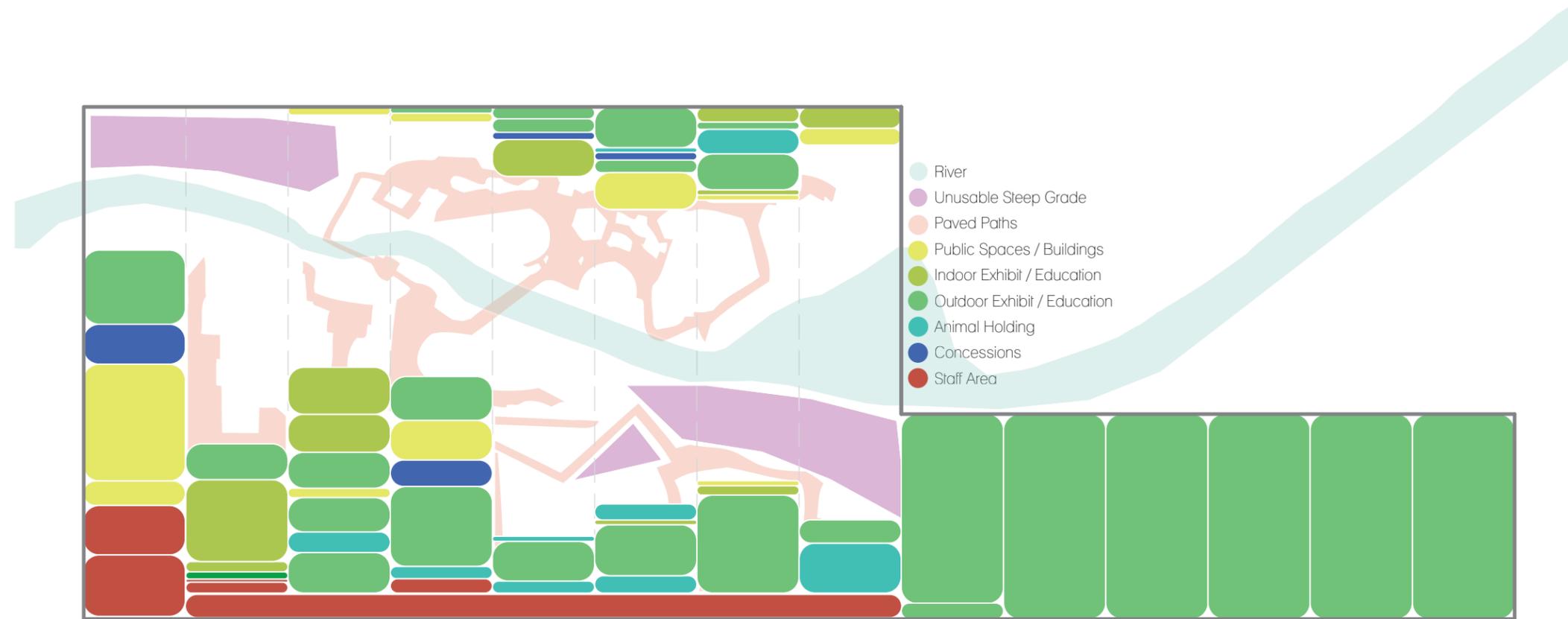
Tree Coverage

Depicting the summer foliage layers overhead, the diagram illustrates the dense groupings of trees close to the river in contrast to the sparse pathway coverage. The trees, particularly near the Mill River, are mainly deciduous trees.



Unusable Land

The areas marked in blue depict the steeper slopes within the property of the zoo. Due to the steep grade of the topography, these areas are unusable for construction in the expansion of the zoo. Observing these areas indicates where expansions and renovations will not be possible.



Current Area Distribution

This diagram indicates the area distribution of specific function groups within the zoo in the form of a histogram. It is a condensed way of representing the space occupied by each functional group. The zoo is extremely dense between the animal exhibits, education opportunities, maintenance spaces, circulation, and unbuildable locations. The high density does not leave much flexibility for the expansion of existing exhibits and holding facilities in order to meet the updated AZA requirements.



Proposed Area Distribution

This diagram indicates the same information as the previous one, except now accounting for an expansion into the Marsh Street Garage area and into the parking lot to the north. This expansion allows for the removal of the large maintenance area on the west side of the zoo. With this area reduced to a simple access road, there is now space to expand the exhibits and holding areas that are in the most need. The maintenance facilities will be greatly enlarged and placed in the Marsh Street Garage area.

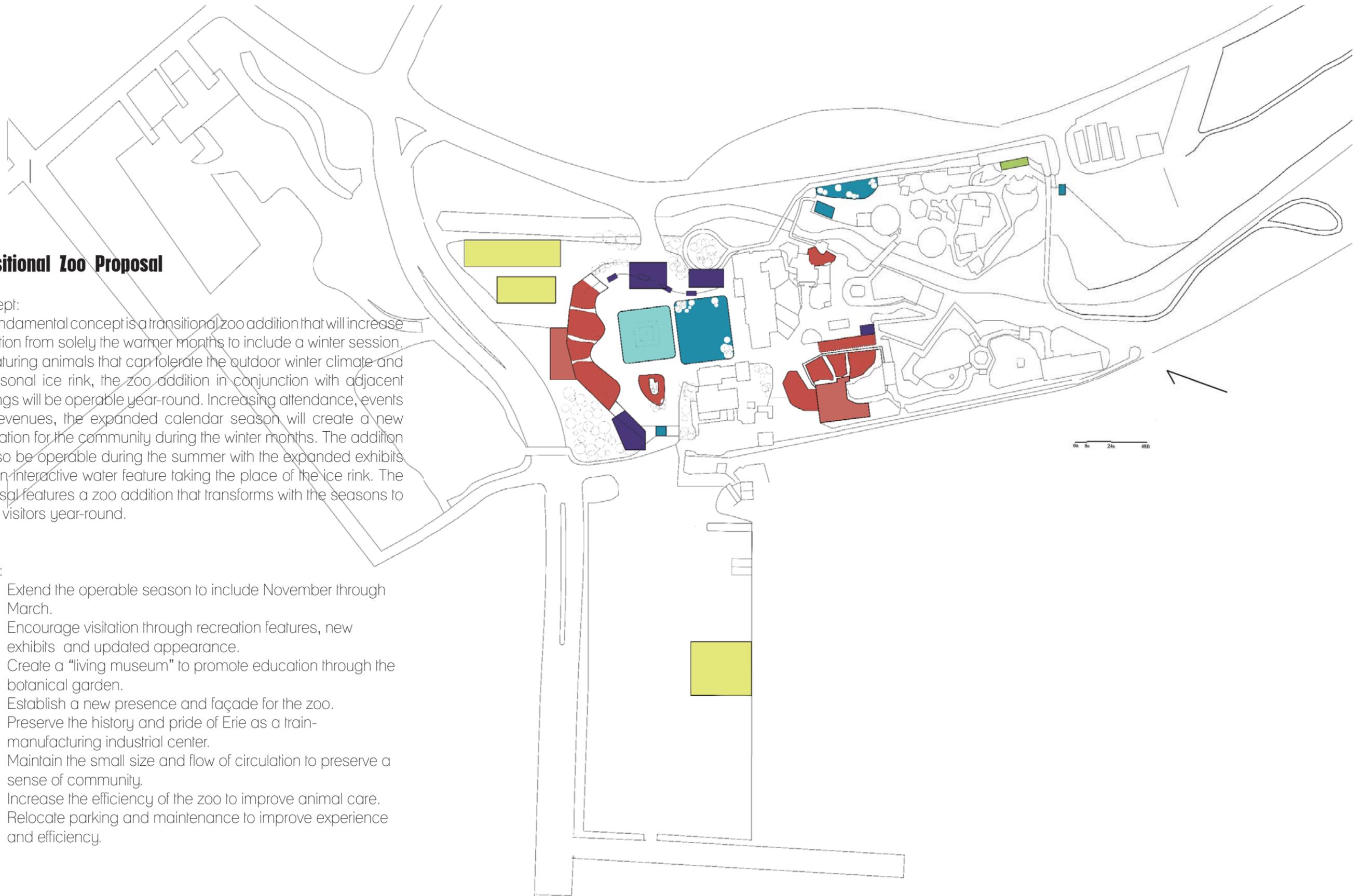
Transitional Zoo Proposal

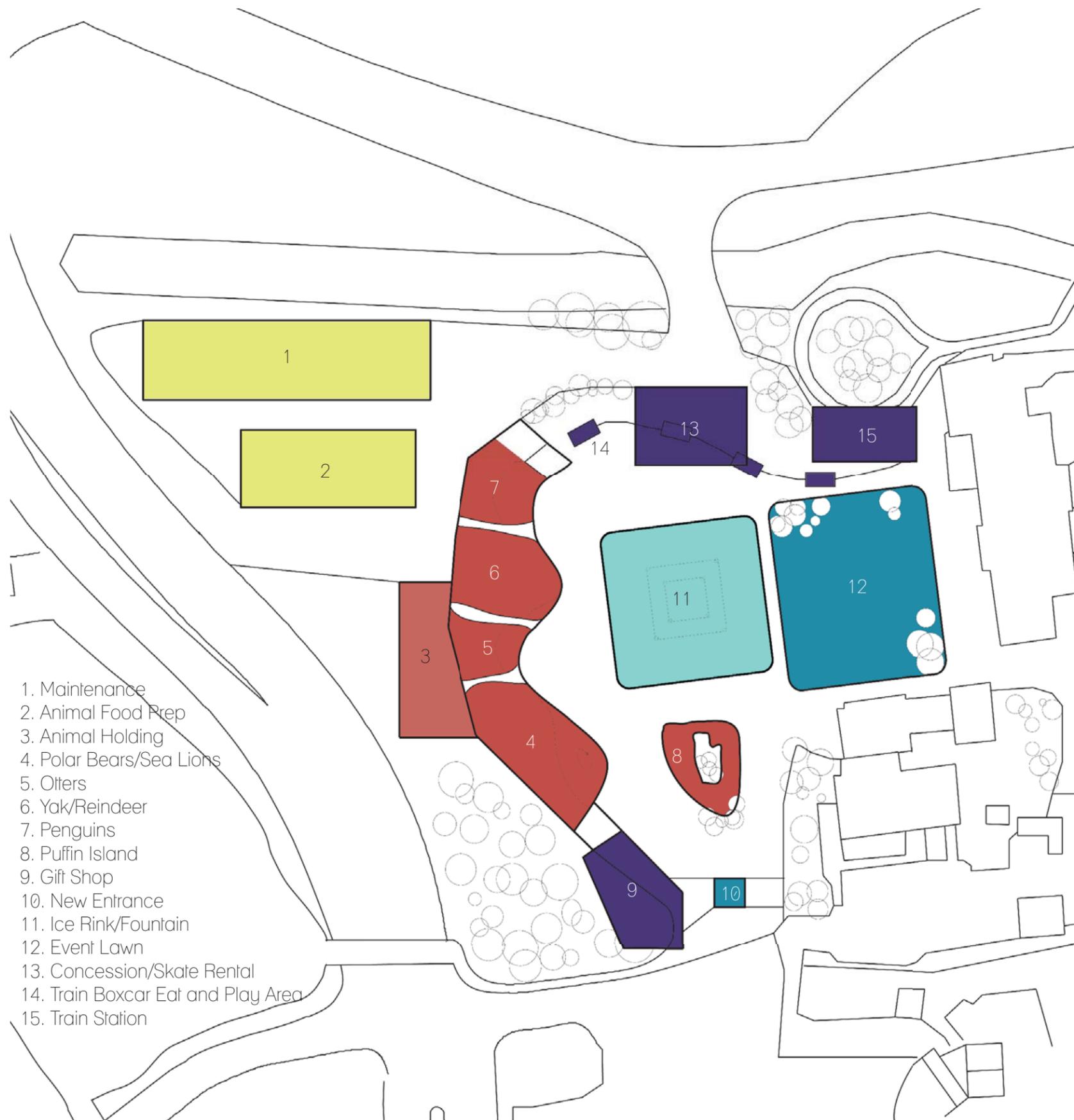
Concept:

The fundamental concept is a transitional zoo addition that will increase operation from solely the warmer months to include a winter session. By featuring animals that can tolerate the outdoor winter climate and a seasonal ice rink, the zoo addition in conjunction with adjacent buildings will be operable year-round. Increasing attendance, events and revenues, the expanded calendar season will create a new destination for the community during the winter months. The addition will also be operable during the summer with the expanded exhibits and an interactive water feature taking the place of the ice rink. The proposal features a zoo addition that transforms with the seasons to entice visitors year-round.

Goals:

- Extend the operable season to include November through March.
- Encourage visitation through recreation features, new exhibits and updated appearance.
- Create a "living museum" to promote education through the botanical garden.
- Establish a new presence and façade for the zoo.
- Preserve the history and pride of Erie as a train-manufacturing industrial center.
- Maintain the small size and flow of circulation to preserve a sense of community.
- Increase the efficiency of the zoo to improve animal care.
- Relocate parking and maintenance to improve experience and efficiency.





Animals

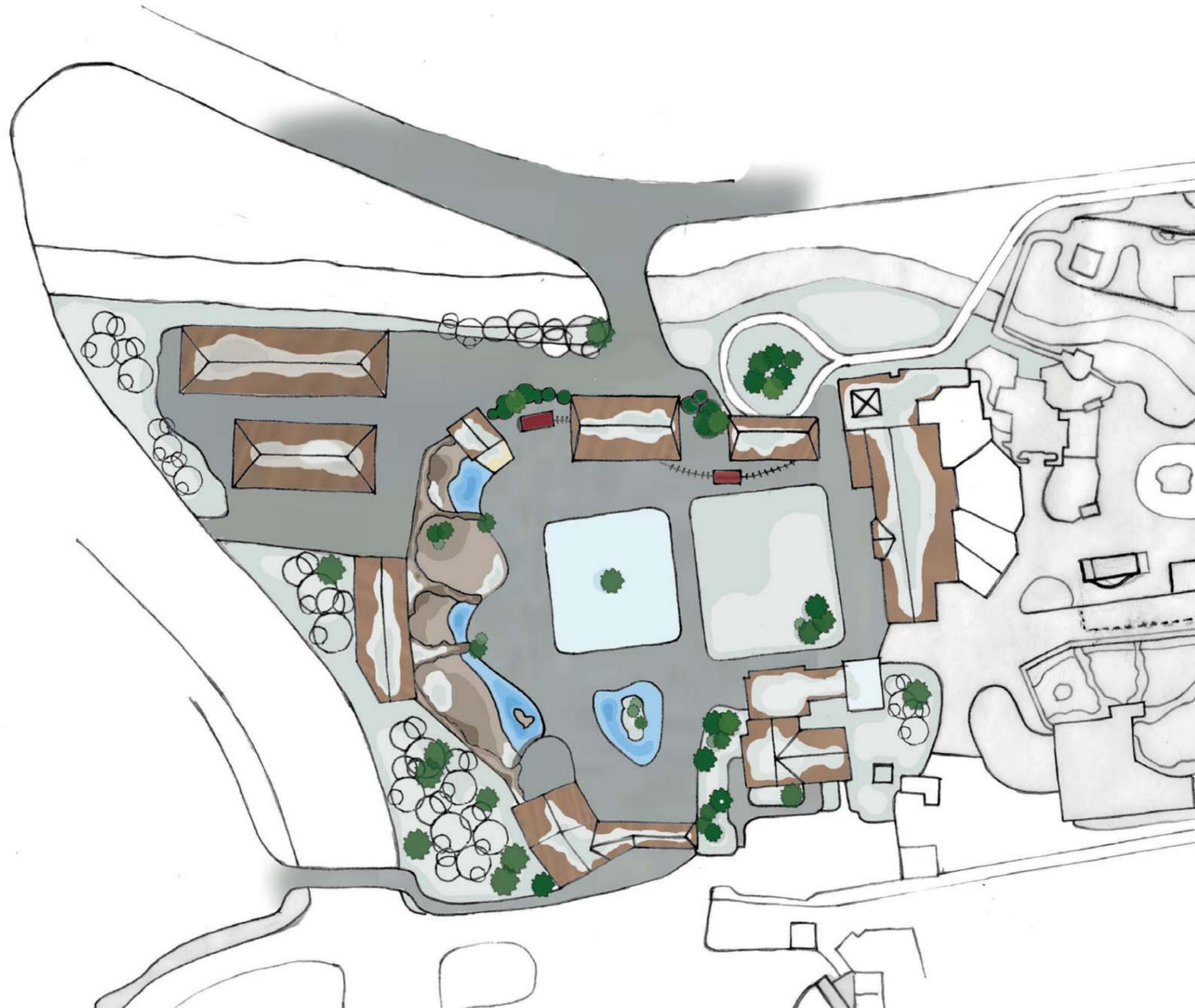
In the expansion, there are a total of four proposed animal exhibits. The current polar bear and penguin exhibits in the zoo would be moved to this new area. The exhibits would involve a winter theme based around the proposed ice rink. The suggested animals are penguins, reindeer, yaks, and a new polar bears. The current otter exhibit could also be relocated to the new addition. The exhibits will contain areas of water to suit the needs of the animals. There are several other animal species that can be put into these exhibits, including sea lions, seals, and other species of bears.

Themed Gardens

Themed gardens are proposed to be installed into the new expansion. The Erie Zoo's Botanical Garden is a key component weaved into the circulation pathways of the zoo. The greenery would predominantly be evergreen trees and shrubbery to provide an educational opportunity for teaching about trees in contrast to the deciduous trees of the rest of the zoo. This would provide "winter" gardens and "summer" gardens, based on whether the greenery was evergreen or deciduous.

Parking

The expansion takes over a large portion of the Erie Zoo's current parking. In response, it is proposed to remove the JMC Ice Rink, and replace it with new parking for zoo visitors. The emergency veterinary clinic that is currently attached to the ice rink will remain there, and is to be expanded to provide adequate space to treat the animals. For days that the Zoo will need overflow parking for larger crowds, a pedestrian bridge across 38th Street to connect to the area of the Marsh Street Garage.



Winter Zoo

Expansion Proposal

Ice Rink: PPG (Pittsburgh) and Rockefeller Center (New York City)



Outdoor Ice Rink

For the winter addition to the zoo, a temporary ice rink is suggested once the indoor ice rink is demolished. An indoor ice rink running year round becomes much more expensive in the long term than the proposed temporary ice rink. An indoor rink must be kept cool enough for the ice to remain frozen, which means all the latent heat that is created by the skaters needs to be extracted. An outdoor rink would require an initial startup cost, a zamboni, which the zoo already owns, and maintenance throughout the winter season. Judging costs on similar examples around the country, it appears that the initial costs and maintenance costs could easily be offset within the first year. For example, large temporary ice rinks in Raleigh and Charlotte, which have warmer climates that require more effort to keep the rink frozen, had an initial price tag of about \$80,000 and generate revenue in excess of \$100,000 each year.

Options for temporary ice rinks vary, but all require large mats that house a piping system to be rolled out across the base of a flat area. These ice mats typically contain 20 ml aluminum tubing in a rollable composite matrix. The network of piping is then filled with a Glycol and water mix, which has a freezing point of -25°C . The mixture is then cooled to a temperature of between -6°C and -7°C and a header/manifold manages the distribution of the cooling fluid to ensure all areas of the matting are at an equally low temperature. Another option includes plastic "ice" which is made of a thin layer of polyethylene coated with propylene glycol. This layer can slow the speed of skaters and has a higher initial installation cost, but it lowers both ice rink upkeep costs and CO₂ emissions. Additionally, Ice-World, an environment-conscious company, offers temporary ice



Holiday Tree Lighting



Summer Zoo



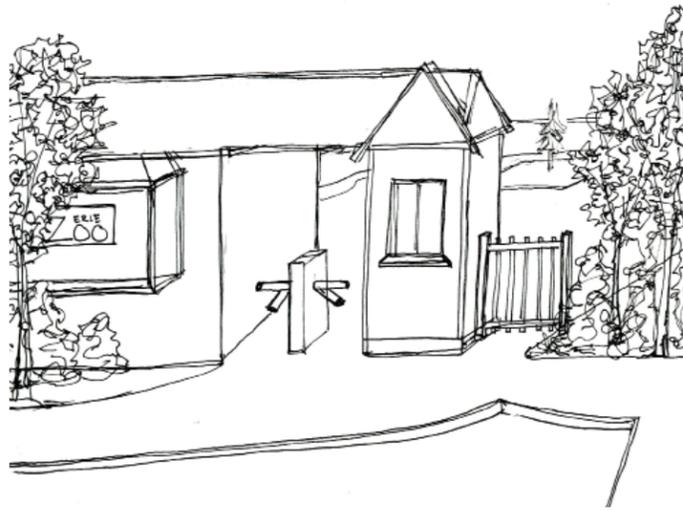
Summer Water Feature: PPG and Rockefeller Center



Outdoor Fountain and Water Feature

During the summer months, the plaza area would become a water feature. It would include a large main fountain with adjacent smaller interactive fountains. The water would pulse from the surface and then fall to below ground level. With lighting and music, it would help to create a relaxed atmosphere. As a calming sensory feature, the water fountain also creates a main point of visual interest within the new addition. Its location adjacent to the event lawn creates a play area for the children and families throughout the summer months. Local concerts and other events could be held during the warm summer evenings for additional revenue earnings.





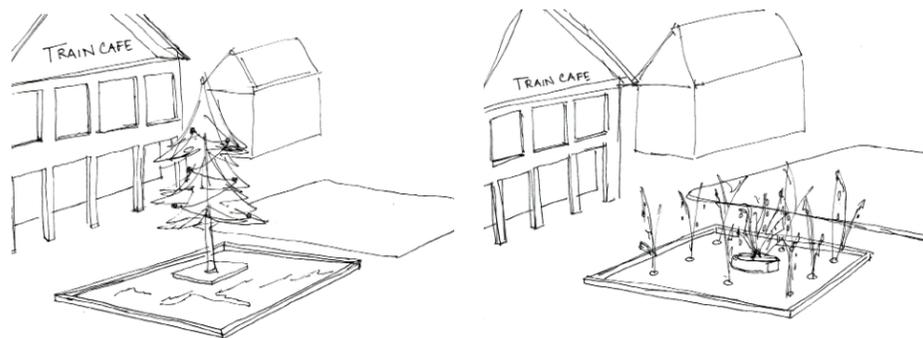
Main Entrance

In the Erie Zoo, the current gift shop is very small and is not advertised well. The current entrance is also very narrow, and it interferes with circulation. The proposal for a new entrance gives the Zoo a more prominent facade for visitors. The gift shop is not only larger, but would have a large window facing the parking lot, so visitors can get a glimpse into the gift shop before they enter the Zoo. The proposal would help the Zoo earn more revenue, give a better facade to the Zoo, and would regulate circulation at the entrance.



Gift Shop

The current gift shop is too small and underutilized. The proposal includes a relocation of the gift shop, so it is near the new main entrance. It also calls for an expansion of the gift shop, and would be backed up against the grade of the land. There is also the possibility of making the gift shop a two-story building to have an overlook. This overlook could look out over exhibits, so the visitors can see certain exhibits from more than one perspective. For example, in the vignette, it is an overlook over the polar bear exhibit because polar bears and other arctic and/or aquatic animals are very interesting, if seen from multiple angles. This concept could be implemented in most animal exhibits.



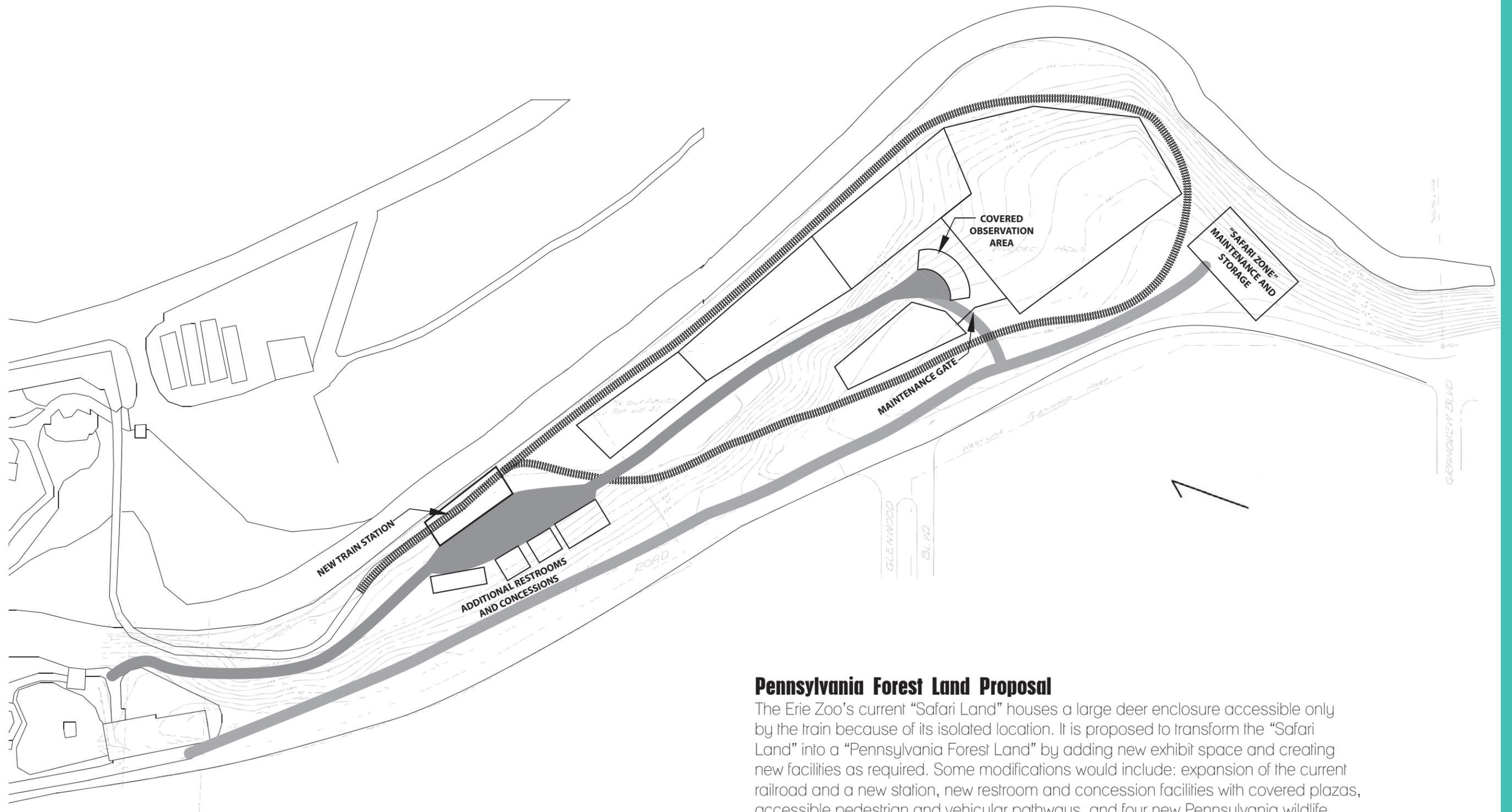
Cafe

Although the current zoo has concessions, the concessions are mostly outdoor, and they are too small. The proposal is to install a new concession in the Transitional Zoo that would be indoor and larger than the other concessions. The concession would also include a small area for skate rentals and other rink-related tasks. The concession would include different types of food and beverage depending on the season. The cafe could also include a train. This train would either consist of parts of old boxcars or would be a replica of these antique trains. Erie, Pennsylvania has a long history with trains and boxcars, and the train within the cafe would expand upon the already existing train park for grandfathers, grandchildren, and families to enjoy. The train would weave through an outdoor seating area, the cafe, and the new train station. The new train would not actually move, but it would be used as an eating area or a play area for children.

Transitional Public Plaza

For the winter addition to the zoo, a temporary ice rink is suggested once the indoor ice rink is demolished. actually move, but it would be used as an eating area or a play area for children.

During the summer months, this area would become a water feature. It would include a fountain with smaller fountains have water that pulses from the surface and disappears into the plaza surface. This creates a main point of visual interest in the new zoo and creates a new play area for children and families. It would be similar to PPG's summer water feature plaza in Pittsburgh.

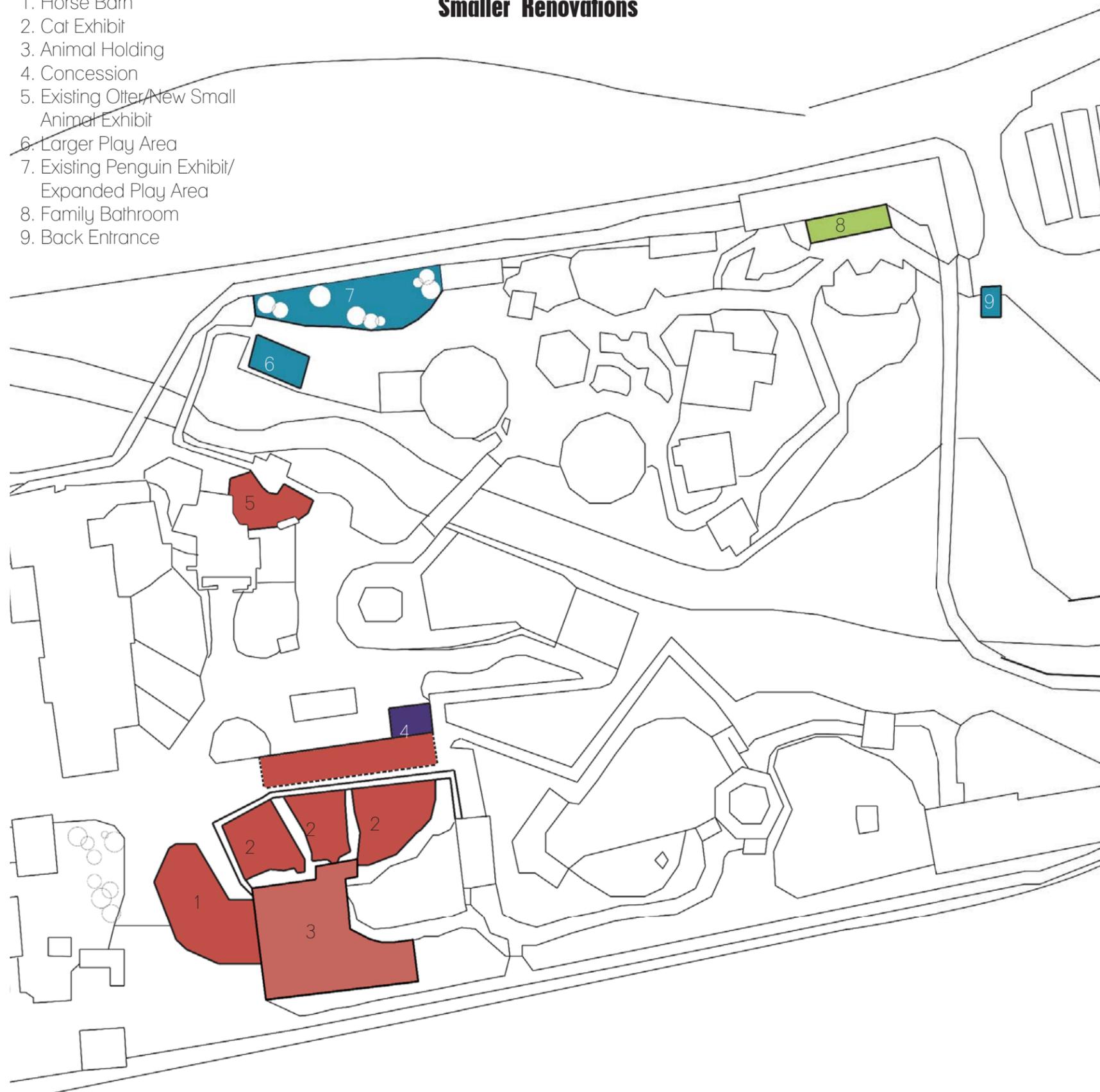


Pennsylvania Forest Land Proposal

The Erie Zoo's current "Safari Land" houses a large deer enclosure accessible only by the train because of its isolated location. It is proposed to transform the "Safari Land" into a "Pennsylvania Forest Land" by adding new exhibit space and creating new facilities as required. Some modifications would include: expansion of the current railroad and a new station, new restroom and concession facilities with covered plazas, accessible pedestrian and vehicular pathways, and four new Pennsylvania wildlife exhibits. Multiple species native to the area could be located in this space include black bear, fox, mink, and gray wolves. The current "up close and personal" experience with the animals afforded by the train will be essential to the success of the new area.

1. Horse Barn
2. Cat Exhibit
3. Animal Holding
4. Concession
5. Existing Otter/New Small Animal Exhibit
6. Larger Play Area
7. Existing Penguin Exhibit/Expanded Play Area
8. Family Bathroom
9. Back Entrance

Smaller Renovations



Polar Bear Exhibit

Since the polar bear exhibit has been moved to the proposed addition, the current polar bear exhibit will be updated and changed into another big cat exhibit. The African Lion exhibit will also be updated.

Otter Exhibit

The otter exhibit will be modified to accommodate smaller animals since the otter exhibit is being relocated as well.

Concession

Due to the larger concessions area in the proposed addition, the main existing eating area in the zoo will be modified. The concessions under the overpass will be removed and a reptile exhibit will go in its place. A smaller stand will be placed against the overpass area on the lower area and seating will remain around it.

Childrens Playground

The area where the current penguin exhibit is located will be the home to an expanded children's play area, as well as a children's garden. The idea behind this is to teach children about plant life as well as providing more area to the botanical gardens aspect of the zoo.

Family Bathrooms in the Childrens Zoo

A few family bathrooms will be placed next to the children's auditorium area, against the train tunnel. This is so that there are bathrooms closer to the back entrance/exit.

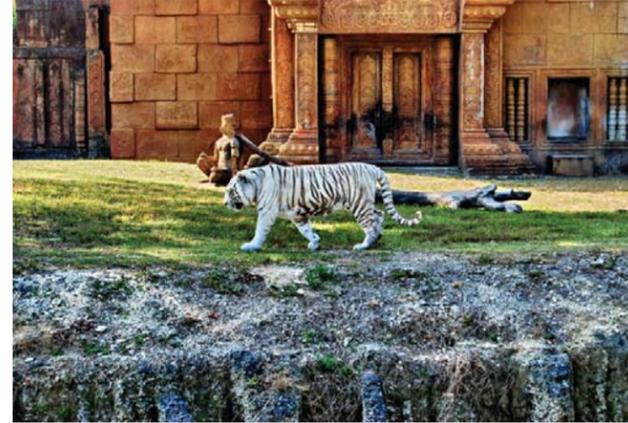
Back Entrance

The back entrance ticket booth will be expanded in size so that it has more of a presence and so that it feels more like an entrance rather than the back door. The aesthetics will also be updated so that it fits in more with the style of the zoo (for example, the CMU will be covered).

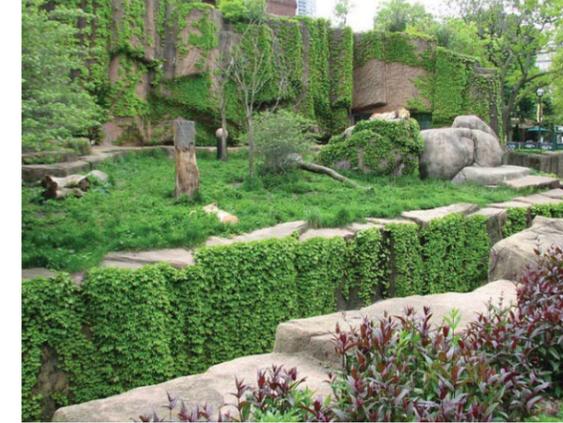
New Big Cat Exhibit: Precedents



San Diego Zoo



San Diego Zoo



Lincoln Park Zoo

Mini Horse Exhibit

The minihorse exhibit will be updated with grass.



Nashville Zoo



Randers Regenskov Tropical Zoo

Children's Play Areas



Oklahoma City Zoo



- 


 Opportunity to add informative signs and graphics within the vegetation of the zoo.
- 
 Areas to introduce an interactive display along the paths of the zoo.
- 
 Intersections where directional signs should be placed.

Circulation

There are currently no way finding signs within the zoo. Other information displays are underutilized because visitors often do not notice them. The diagram illustrates areas along the pathways within the zoo that offer opportunities to add new signage and intermediate stopping points.

POLAR BEARS

DID YOU KNOW?

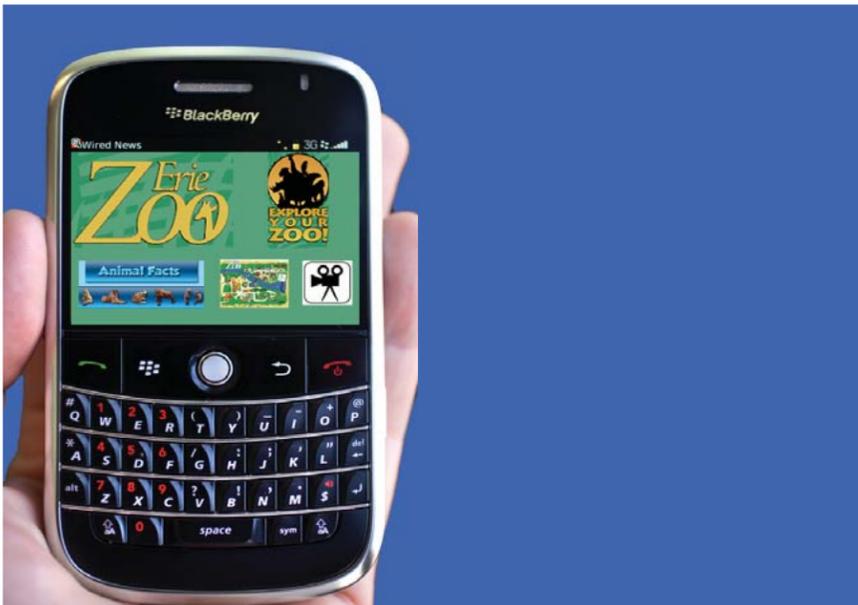
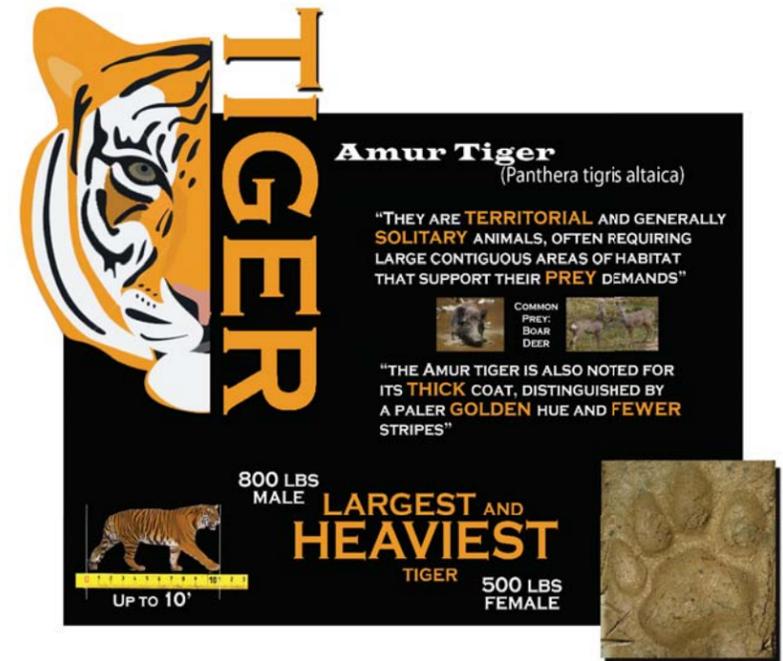
When the ice is too thin, Polar Bears crawl on their bellies to prevent the ice from breaking.



Informative Signs

Throughout the pathways of the zoo, small graphics can be placed with information such as fun facts, did you know, and similar easy to read, quick descriptive signs.

These signs are not only easier to read, but they are fun for kids and families. Kids will be able to learn fun facts about the zoo animals.



iPhone App

Create a phone application that allows visitors to use an interactive map while in the zoo, access animal pictures, information, and facts, and see live video feed from different exhibits while not at the zoo. This application could be included in membership costs, or purchased for the price of \$2. All or some of the proceeds can go to supporting the Erie Zoo. The goal is to make each visitors zoo experience more informative and interesting, while not taking time away from the zoo keepers.



Zoo Key

Unlocks information boxes that offer two types of information, one for an older crowd and one for younger children. These "talking storybooks" can play an educational song about the exhibit it is located at, list fun, interesting facts about the animals, and be incorporated with an interactive screen for zoo visitors. The key can be \$2 at the gate with purchase of admission. The goal is to achieve more education on the animals at the zoo without inhibiting the zoo keepers while they work. With the two different types of information it is possible for this to be attractive and worthwhile for every age group of visitors.



Proposed 2010 Calendar Of Events

-  Opening Day
-  Spring Egg- Venture Egg Hunt
-  Cat Nation Cat Show/ Erie Zoo Art Show
-  Erie Zoo Parade
-  Healthy Zoo, Healthy You Family Day
-  Equipment Day
-  Members Day
-  Garden Conservancy Program
-  GalapaZOOza
-  Frozen Safari
-  Senior Citizen Day
-  McDonalds Day
-  Clown Day
-  Family Fun Run
-  WQLN Kid's Club Day
-  ZooBoo
-  Last Day of Zoo Season
-  Winter Zoo/ Ice Rink Opens, Holiday Tree Lighting
-  Winter Zoo/ Ice Rink Closes
-  ZooBrew

January							February							March						
Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2		1	2	3	4	5	6		1	2	3	4	5	6
3	4	5	6	7	8	9	7	8	9	10	11	12	13	7	8	9	10	11	12	13
10	11	12	13	14	15	16	14	15	16	17	18	19	20	14	15	16	17	18	19	20
17	18	19	20	21	22	23	21	22	23	24	25	26	27	21	22	23	24	25	26	27
24	25	26	27	28	29	30	28							28	29	30	31			
31																				

April							May							June						
Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3							1			1	2	3	4	5
4	5	6	7	8	9	10	2	3	4	5	6	7	8	6	7	8	9	10	11	12
11	12	13	14	15	16	17	9	10	11	12	13	14	15	13	14	15	16	17	18	19
18	19	20	21	22	23	24	16	17	18	19	20	21	22	20	21	22	23	24	25	26
25	26	27	28	29	30		23	24	25	26	27	28	29	27	28	29	30			
							30	31												

July							August							September						
Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3	1	2	3	4	5	6	7				1	2	3	4
4	5	6	7	8	9	10	8	9	10	11	12	13	14	5	6	7	8	9	10	11
11	12	13	14	15	16	17	15	16	17	18	19	20	21	12	13	14	15	16	17	18
18	19	20	21	22	23	24	22	23	24	25	26	27	28	19	20	21	22	23	24	25
25	26	27	28	29	30	31	29	30	31					26	27	28	29	30		

October							November							December						
Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2		1	2	3	4	5	6				1	2	3	4
3	4	5	6	7	8	9	7	8	9	10	11	12	13	5	6	7	8	9	10	11
10	11	12	13	14	15	16	14	15	16	17	18	19	20	12	13	14	15	16	17	18
17	18	19	20	21	22	23	21	22	23	24	25	26	27	19	20	21	22	23	24	25
24	25	26	27	28	29	30	28	29	30					26	27	28	29	30	31	
31																				



Phase 1 Signage

The first phase consists of putting updated graphics throughout the zoo. These graphics include more readable signs describing the animals, interactive signs such as a touchscreen, and signs indicating direction. This is to ensure that all visitors can find where they are going throughout the zoo and have a cohesive experience.

Phase 2 Remove JMC Ice Rink and Pave Parking Lot across 38th Street

The second phase includes removing the existing JMC Ice Rink and expanding the surrounding parking lot. Also, the parking lot across 38th Street will be paved to create more parking for busier days.

Phase 3 Maintenance Corridor

The third phase entails renovating the already-existing maintenance corridor. The Zoo finds this corridor to be successful for their maintenance and service needs, but the road is too wide and it is too visible to the public. The corridor will be made thinner which allows the new cat exhibit and the horse barn exhibit to be larger.

Phase 4 Transitional Zoo, Forest Land, and Pedestrian Bridge

The last phase is the new expansion along with a pedestrian bridge across 38th Street. This pedestrian bridge creates more parking to replace the parking lost with the new expansion. The Transitional Zoo will be a portion of the Zoo that is open all year long. This Phase would also include the Pennsylvania Forest Land Proposal.





