

**ESSEX COUNTY
TURTLE BACK**



MASTER PLAN

NOVEMBER 2019



MASTER PLAN DRAFT

November 2019

PREPARED FOR:

Turtle Back Zoo & Zoological Society of New Jersey
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TABLE OF CONTENTS

Introduction & Planning Process	2
Strategic Master Plan Goals	3
Existing Project Implementation Summary	4
Opportunities & Planning Overview	5
Overall Master Plan	6
Concepts & Visitor Experience Diagram	7
Project Zones Plan	8
Project Implementation Schedule & Business Potential	9
Entry Plaza & Exhibits	10
East Zone - North America	11
Campus Parking Assessment - Existing Conditions	12
Campus Parking Assessment	13
Primate Forest	14
Australia Outback & Nature Play	15
South Campus African Expansion	16
Tropics	17
Conservation Education	18
Appendix	19
Appendix - Existing Land Use Plan	20
Appendix - Inventory & Analysis Summary	21
Appendix - Existing Building And Exhibit Inventory	22
Appendix - Circulation	23

INTRODUCTION

In an otherwise bustling region of the New York Metropolitan area, there exists a rural retreat where visitors come to explore and share in the wonders of the natural environment. The area, known as the South Mountain Reservation (SMR), is home to many outdoor attractions. One notable attraction is the immensely popular Turtle Back Zoo.

Located in West Orange, New Jersey, as a part of the Essex County Park System, the Turtle Back Zoo sits on a 32-acre plot of land nestled in the SMR landscape between a naturally occurring forested hillside on its eastern and southern borders and the expansive Orange Reservoir to the west. Northfield Avenue, which borders the site to the north, acts as the visitors' primary circulation and access point into the recreation complex and ultimately the Zoo itself.

Though modest in size, the Turtle Back Zoo delivers on a variety of guest experiences. The animal collection is dynamic and exhibits species from North America, Asia, Africa, and Australia, providing visitors with opportunities to view, interact with and learn about these unique animals and the role they play in their local ecosystems. The Zoo counterbalances the animal habitat experiences with interactive petting areas, walk-through aviaries, play zones, and aerial ropes courses, tending to the interests of visitors of all ages. Finally, the Zoo embraces its natural surroundings by offering scenic train rides through the lush South Mountain Reservation.

The Zoo has been in operation since 1963 and only in the last 15 years has experienced a boom in both project implementation and attendance growth. It is no coincidence that the two are related. With exciting new exhibits continuing to open, the Turtle Back Zoo hit 907,522 visitors in the 2017 season, which is quite an accomplishment for a Zoo of this size. But with attendance on the rise, the Turtle Back Zoo must take the necessary steps to plan for such an increase in visitor capacity and work towards a model for sustainable growth.

CONTEXT MAP



PLANNING PROCESS

The Turtle Back Zoo engaged in a master planning process with CLR Design and Zoo Advisors in the summer of 2017. The first step was to establish goals and priorities for the Master Plan. What does the Zoo want to gain from conducting a Master Plan and how will these goals and priorities help reshape the way the Zoo functions in the future? During initial meetings with the Zoo, the design team asked a series of thought-provoking questions about the zoo itself, its infrastructure, and how visitors occupy the space.

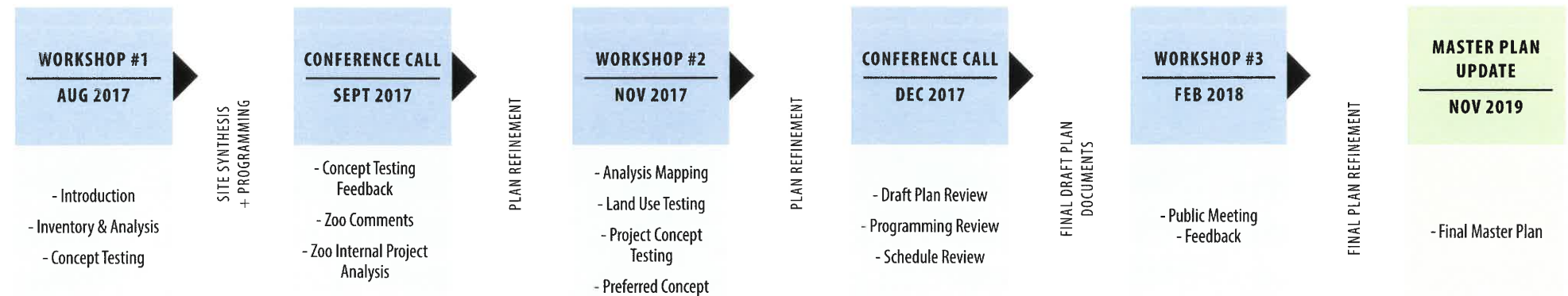
By studying how visitors move about the Zoo, the design team concluded that the Turtle Back Zoo faces numerous issues related to visitor capacity and aging infrastructure. For example, the flow of the visitors is restricted due to the narrow meandering pathways which result in bottlenecks at points of interest. Service access to certain zones within the Zoo is compromised due to the volume of guests occupying the pathways and inhibiting access by service vehicles. Circulation is circuitous and ill-defined and results in pulses of heavy visitor traffic. Improving these characteristics are fundamental to providing an enjoyable experience for visitors. However, infrastructure improvements have been completed at the main entrance to accommodate larger crowds. The enhanced entry increased the number of admission windows from four to thirteen and provided for a larger patio area for visitors to gather before entering the zoo, eliminating lines from extending into the parking lot.

The design team documented circulation, building, and exhibit conditions and observations related to daily function, looking for noticeable patterns of opportunity within the campus. This information, coupled with the input and needs from stakeholders evolved into a list of key opportunities which were then documented on a diagram to help facilitate the Master Plan. Master planning is an iterative process whereby concepts are proposed, tested, revised, and retested until proven to be valid. By conducting interactive workshops with stakeholders, these concepts can be vetted by the end user and evolved until goals are met and issues are addressed.

This Master Plan identifies priority project zones, begins to test the target animal and visitor program elements and experiences and, coupled with a strategic business plan, will help the zoo properly plan for and implement projects which will help the Turtle Back Zoo to elevate animal welfare commitment, grow a successful business, become a destination in the region, build capacity to support growth, and enhance conservation missions.

While this Master Plan was being developed, Turtle Back Zoo was in the process of making several capital upgrades. These projects include the main entry plaza, train engineering house, and parking garage #3. In addition, the plan reflects the completion of a traffic study to evaluate current and future driving and parking considerations.

PLANNING PROCESS DIAGRAM



STRATEGIC MASTER PLAN GOALS

Over the last fifteen years, the Turtle Back Zoo has been on an incredible growth trajectory with exponential attendance growth, adding new exhibits and experiences each year. It has fast become a regional destination and is seen as a must-see attraction for the surrounding area. The vision is to continue that growth, continuing to enhance the Zoo as an asset for the County while also expanding its reach to an even broader geographic area.

The ideas and concepts in the plan were developed to enhance the Zoo's mission programs,

activities and initiatives and also to grow attendance, generate new revenue, and widen the Zoo's base of support. The Zoo is at a critical point in its development and now is the time to invest in building the capacity and infrastructure the Zoo needs to accommodate growth in visitation while also continuing to add to the visitor experience.

The strategic master plan has been created with the following goals serving as the foundation for development.

CONTEXT MAP



ELEVATE ANIMAL WELFARE COMMITMENT

As perceptions of zoos evolve with an increased and added focus on animal care, the Turtle Back Zoo must further develop an even greater and diverse collection of state-of-the-art habitats, holding, and veterinary facilities. The new habitats should be designed to promote naturalistic animal behavior and enhance the overall experience for both animals and visitors alike, highlighting the progress the zoo has made and its commitment to the highest standards of animal welfare.

BECOME A DESTINATION IN THE REGION

The greater metro New York region and metropolitan statistical area (MSA) offers huge potential for growth. This master plan identifies many new high-profile exhibits that can be developed which will continue to enhance the profile and position of the Zoo as a must-see attraction for the metropolitan area and beyond.

GROW A SUCCESSFUL BUSINESS

It goes without saying that long-term stability and financial sustainability are critical to the existential health of the Zoo as time passes. While the Zoo exists primarily to fulfill its experience and conservation mission, there can be no mission without margin. Thus, throughout the plan a number of opportunities have been identified to generate increased income by growing attendance and offering new amenities, attractions, and encounters.

BUILD CAPACITY TO SUPPORT GROWTH

The Zoo has experienced tremendous growth, however its campus and infrastructure weren't originally built to support such high visitor traffic demand nor the mega-charismatic species the Zoo now has in its care. The next phase of growth must build a stronger physical foundation to support the growth with respect to parking, traffic, visitor flow and viewing, and site amenities.

ENHANCE CONSERVATION MISSION

The role of zoos continue to progress with greater emphasis placed on their conservation and education missions. As the Turtle Back Zoo grows and moves into the top tiers of zoos nationally, so too must the Zoo's commitment to conservation be strengthened. The Zoo's collection will highlight the conservation importance and the experience will be developed to support conservation action and inspiration.

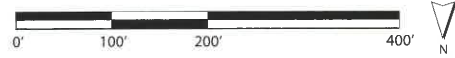
EXISTING PROJECT IMPLEMENTATION SUMMARY

The diagram to the right represents the projects which have been implemented at the Zoo over the last 15-plus years. A total of 26 major projects have sculpted the Zoo's landscape within that time. In some years upwards of 5 projects have been implemented. When considering future growth and expansion at the Zoo, one should recognize timing as a key element. Timing will help to schedule the milestone openings of projects in order to align with financial opportunities over a sustained period that can be supported by operations. Openings generate interest, increase attendance and ultimately generate revenue for the Zoo. A strategic plan for when to implement a project will promote an overall model for sustainable growth.

- 2007 ① Outdoor Dining Pavilion
② American Exhibit (Eagle, Bobcat, Porcupine)
- 2008 ③ Carousel
④ Carousel Picnic Area
⑤ Aviary
⑥ Penguin Exhibit
- 2009 ⑦ Gibbon Exhibit
- 2011 ⑧ Big Cat Country Exhibit
⑨ Picnic Area
- 2013 ⑩ Sea Lion Exhibit
⑪ Parking Lot Improvements
- 2014 ⑫ Educational Center & Secondary Entry Plaza
- 2015 ⑬ Giraffe Exhibit
⑭ Café Additions & Alterations
⑮ Pony Ride Arena & Holding Stalls
- 2016 ⑯ Condor Exhibit
⑰ Bison Exhibit Improvements
⑱ Petting Zoo Improvements
⑲ Sea Turtle Building
- 2017 ⑳ Lion and Hyena Exhibit
㉑ Cattle and Wolf Exhibit Improvements
㉒ Penguins Exhibit
㉓ Flamingos Exhibit
- 2019 ㉔ Entry Plaza
㉕ Train Engineering House
㉖ Parking Garage 3



OPPORTUNITIES & PLANNING OVERVIEW



THE BALANCED APPROACH

During the initial phase of the planning process, the team evaluated the existing conditions of the Zoo and identified opportunities and constraints throughout the campus. This data coupled with the Zoo's programmatic needs was organized into three categories of Exhibits and Attractions, Strategic, and Infrastructure. This organization ensures that the priorities, and ultimately the projects resulting from the plan, are tied to a balanced implementation approach.

EXHIBITS AND ATTRACTIONS

- 1 Habitat Zone #1 - Utilize zoo's core location. Opportunity for consolidated exhibit zone. Good connection to future service.
- 2 Habitat Zone #2 - Utilize underused zoo area to enhance the African exhibit experience.
- 3 Habitat Zone #3 - Utilize underused zoo area to enhance the visitor's experience within the south end of the zoo.
- 4 Habitat Zone #4 - Consolidate land areas, including some outdated exhibits for larger habitat spaces.
- 5 Exhibit Space - Utilize underused zoo area for animal exhibits.
- 6 Wild NJ/North America Play Area - Create indoor viewing amenity.
- 7 Entry Plaza - Improve visitor flow and direction, and accommodate arrival capacity. Opportunity to overlay habitat or trail sequence.
- 8 Tropics - Renovate the existing reptile house into a state of the art tropics building.

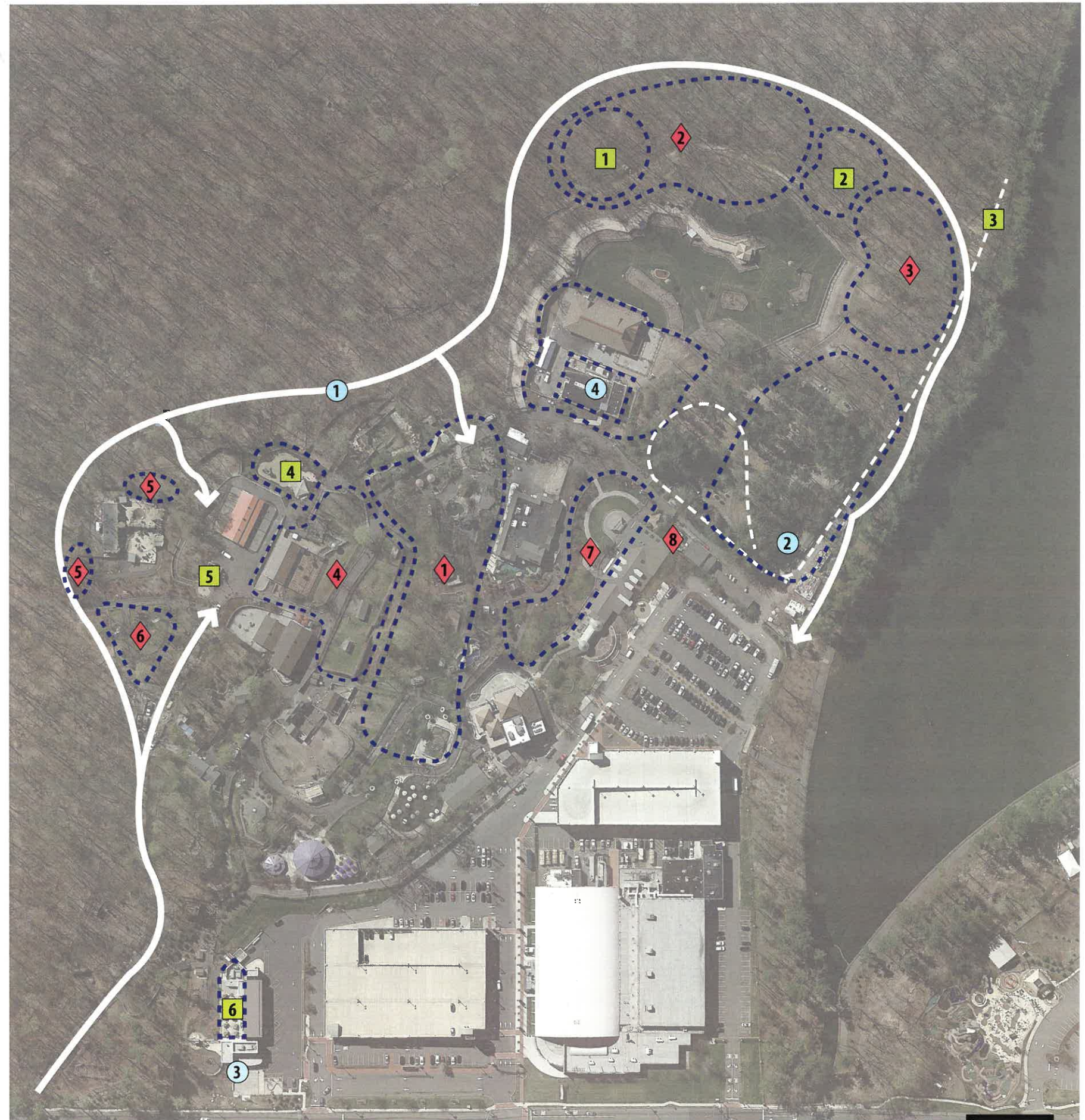
STRATEGIC

- 1 Conservation Zone - Conservation Pavilion opportunity within Africa based exhibits. Pavilion may double as a flexible use habitat. Ambassador holding location.
- 2 Amenities Hub - Incorporate cafe, restroom, gift shop and education into an African hub that provides strategic key visitor services to the Africa Adventure Exhibit.
- 3 Train Route - Incorporate into habitats for enhanced viewing and train ride experience.

- 4 Playground - Enlarge and include opportunities for nature play. Maintain one entry / exit point.
- 5 East Zone Hub - Provide visitor amenities such as food, restrooms, gifts kiosks, indoor experiences.
- 6 Education - Enhance the education program by providing additional indoor and outdoor classroom and learning spaces.

INFRASTRUCTURE

- 1 Service Road - Provide a continuous access route around zoo. Externalize primary service circulation route and provide key access points into campus.
- 2 Service & Staff - Provide consolidated service zone for zoo and campus maintenance, storage, and staff & parking garage.
- 3 Entry - Upgrade secondary entry to assist with primary entry flow and ropes course ticketing.
- 4 Vet Center - Upgrade facilities to handle quarantine & breeding. Overlay an interpretive storyline to convey animal care practices and techniques to visitors plus VIP tours & gifts.



MASTER PLAN

NOVEMBER 2019

OVERALL MASTER PLAN



SITE PLAN LEGEND

- Habitat Zone - Proposed
- Habitat Zone - Recently Implemented
- Animal Holding Building
- Visitor Building
- Service Road
- Visitor Path
- Visitor Hub
- Revenue Opportunity - Existing
- Revenue Opportunity - Proposed



TEST PROGRAM

AREA	SIZE
Hoofstock Habitat A	45,200 SF
Hoofstock Habitat B	36,500 SF
Hoofstock Holding	14,000 SF
Hoofstock Off-Exhibit Yard	3,000 SF
Giraffe/Eland/Ostrich Habitat	85,700 SF
Zebra/Eland/Ostrich Habitat	34,700 SF
Zebra/Eland/Ostrich Holding	3,000 SF
Meerkat Habitat	2,700 SF
Meerkat Holding Building	900 SF
Cheetah Run	15,000 SF
Cheetah Holding	1,700 SF
Aviary A / Flex (primates)	2,500 SF
Aviary B / Flex (primates)	2,500 SF
Aviary A & B Holding Building	750 SF
Aviary C	2,500 SF
Aviary C Holding Building	1,200 SF
Otter Habitat	5,200 SF
Otter Holding Building & LSS	1,000 SF
Habitat A - Gibbon Flex	3,100 SF
Habitat B - Mandrill Flex	6,900 SF
Habitat C - Flexible Use	4,500 SF
Habitat D - Orangutan Flex	7,500 SF
Mandrill & Orangutan Holding Bldg	2,300 SF
Habitat E - Tree Kangaroo	2,300 SF
Tree Kangaroo Holding Building	850 SF
Habitat F - Cassowary	5,300 SF
Habitat G - Kangaroo / Emu	7,500 SF
Cass, Kangaroo, Emu Holding Bldg	1,000 SF
Habitat H Zone	11,500 SF
Habitat H Holding Building	2,000 SF
Wild NJ Enhancements and North America Play Area	13,400 SF
Play Area	8,600 SF
Tropics Event Exhibit Building	10,000 SF
Café	8,000 SF
Dining Overlook	5,000 SF
Conservation Pavilion	8,700 SF
Veterinary Services Expansion	2,800 SF
Education Building Expansion	3,400 SF

CONCEPTS & VISITOR EXPERIENCE DIAGRAM

CONSERVATION PAVILION

- Pavilion for interactive presentations and event rental.
- Cheetah run and habitat.



WILD NJ & NORTH AMERICA PLAY

- Immersive habitats
- Children's play areas



PRIMATE FOREST

- Primate brachiation viewing
- Training and feeding demonstration



AFRICA OVERLOOK

- African themed plaza with indoor / outdoor dining and habitat overlooks.
- Up close viewing of large mammals.
- Outdoor plaza space for special event rentals.
- Giraffe feeding.
- Train ride with habitat views.



ENTRY HABITATS

- High value first impression habitats
- Inviting gateway and plaza space
- Gift shop and souvenirs
- Indoor experiences



PROJECT ZONES PLAN

As stated in the introduction to this master plan document, the development and attendance growth at the Turtle Back Zoo is exceptional. Looking ahead over the next 10-15 years, careful and strategic thought should be mindful of this rapid growth pattern. Growth should be implemented in a balanced approach whereby a combination of animal,

visitor, and infrastructure projects should be strategically constructed to compliment each other and help sustain the development and growth of the Turtle Back Zoo. The project zones identified on this page are organized by priority and fulfill the categories listed in the balanced approach on page 4.

PRIORITY A PROJECTS - SHORT TERM

1. ENTRY PLAZA & EXHIBITS: Test opportunities to enlarge the entry plaza immediately within the gates to better accommodate the visitors entering and exiting the Zoo. Overlay animal habitats to generate immediate interest for visitors and provide a new vision for the Zoo's main entry.

2. EAST ZONE: Utilize the existing underused areas and facilities to enhance this area as a visitor hub in this section of the zoo. Provide new amenities such as renovated restrooms, food service, and indoor viewing experiences. Modernize and enhance the Wild New Jersey habitats.

3. MISC. RENOVATIONS: Renovate existing exhibit infrastructure including service and support components and utilities to meet the modern-day standards of animal care. Such renovations will ensure that the Zoo continues to adapt to and support the increasing growth and modernization at the zoo for many years to come.

PRIORITY B PROJECTS - MID TERM

4. PRIMATE FOREST: Utilize the existing hillside and retired exhibit zone in the core of the Zoo to implement a series of linked primate habitats. Habitats may be connected by a series of arboreal chutes which will promote naturalistic brachiating behavior and perhaps transport primates to the existing cafe and entry plaza aviaries for unique visitor viewing.

5. AUSTRALIA OUTBACK & NATURE PLAY: Retire outdated South America habitats and enlarge the Australian zone to incorporate new species such as cassowary and tree kangaroo. Consolidate service zones and maintain separation from visitor pathways. Incorporate nature play zones for children and enlarge the existing prehistoric playground.

PRIORITY C PROJECTS - LONG TERM

6. SOUTH CAMPUS AFRICAN ADVENTURE EXHIBIT: The southern end yields the greatest opportunity as it is accessible, adjacent to opportunistic habitats, and topographically suitable. The introduction of new species will complete a second major loop of the primary pedestrian path leading visitors out to a destination hub providing food services and overlooking large mammal habitats. The train layout will be modified to take advantage of views into habitats while the Conservation Pavilion will compliment Hoofstock A by acting as a flexible use habitat. The existing vet center will receive an addition allowing it to handle capacity for larger animal care and breeding.

7. TROPICS: The existing reptile building will see an overhaul to transform it into a cutting-edge tropics building for reptiles, primates, and other tropical species. The space will also double as a major events venue and revenue opportunity for the Zoo. Animal habitats will provide a unique backdrop for the special events while a roof deck will overlook the Orange Reservoir. The gardens located to the south of the tropics building will provide a visual and physical link to the original amphitheater and the Orange reservoir.

8. CONSERVATION EDUCATION: To satisfy the increasing demand for education programming and classroom space, the current education building will require an addition to the east which will add new interior and exterior learning spaces to better suit the needs of the Zoo. Additionally, the secondary Zoo entry will be renovated to handle the Zoo's increasing attendance and provide better connectivity to pedestrian circulation routes to and from the parking lots.



IMPLEMENTATION SCHEDULE

PROJECTS	ATTENDANCE*	CONSTR. COST	IMPACT**	1	2	3	4	5	6	7	8	9	10	EXHIBITS & ATTRACTIONS	STRATEGIC SERVICES	INFRASTRUCT.
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027			
PRIORITY A PROJECTS (SHORT-TERM)																
MISCELLANEOUS RENOVATIONS (Train)	↗	\$	\$	TRAIN ●	●		VET ●									×
ENTRY PLAZA / EXHIBITS	↗	\$ \$	\$		ENTRY ●			●			●			×	×	×
CAMPUS PARKING ASSESSMENT & TRAFFIC STUDY		\$ \$		●	GARAGE ●											×
EAST ZONE - NORTH AMERICA	↗↗	\$ \$	\$ \$									●		×	×	
PRIORITY B PROJECTS (MIDTERM)																
SERVICE FACILITIES		\$ \$				SERVICE ROAD ●										×
PRIMATE FOREST	↗↗↗	\$ \$ \$	\$ \$ \$			ORANG ●	●	●						×		
AUSTRALIA OUTBACK & NATURE PLAY	↗↗	\$ \$	\$ \$							●				×	×	
PRIORITY C PROJECTS (LONG-TERM)																
SOUTH CAMPUS - AFRICAN ADVENTURE EXHIBIT	↗↗↗	\$ \$ \$	\$ \$ \$			CONSERVATION PAVILION ●	PHASE 1 - HOOFSTOCK B ●		PHASE 2 - HOOFSTOCK A ●			PHASE 3 ●		×	×	×
CONSERVATION EDUCATION		\$ \$	\$ \$					●							×	×
TROPICS	↗↗	\$ \$ \$	\$ \$ \$								●			×	×	

LEGEND:

*ATTENDANCE GROWTH OPPORTUNITY: ↗ : <6% growth ↗↗ : 6%-10% growth ↗↗↗ : >10% growth

**REVENUE GROWTH IMPACT

A multitude of business opportunities exist tied to the master plan improvements.

- **ATTENDANCE GROWTH:** The greatest revenue will be realized through increased visitation. With each project opening visitation will continue to grow. New visitors will be attracted to the Zoo with these unique new exhibits and previous guests will have an incentive to return.
- **MEMBERSHIP REVENUE:** The Zoo will be able to continue to grow its membership base, converting a percentage of those new and existing visitors to members. Additionally, as admission prices increase, so too should membership prices and membership revenue across all categories.
- **FOOD AND RETAIL SPENDING:** New food outlets will be added including a completely reimagined Safari Lodge. The Zoo will also realize added food sales as visitors extend their stay time and stay at the Zoo for an added snack or meal.
- **CATERING & EVENT RENTALS:** The addition and increase in dedicated event rental facilities adds to the Zoo's capacity to host more events. Spaces are designed to have unique offerings and unforgettable and unrivaled settings for events allowing for premium pricing.
- **EXPERIENCES:** Multiple experiences have been proposed to further enhance the guest visit as well as offer added opportunities for revenue generation. These amazing and one-of-a-kind experiences have proven quite successful at other facilities and engage guests in a whole new way.
- **FEEDINGS:** Added opportunities to touch and feed can be created within the exhibit areas. Feedings can be offered for an additional charge.
- **EDUCATION PROGRAMS:** Improvements, particularly at the Conservation Pavilion, offer opportunities to further the Zoo's education and conservation mission. Special programs can be offered and space for parties.
- **SPONSORSHIP:** The new exhibits also offer opportunities to engage new corporate sponsors for different Zoo elements, programs or initiatives.
- **DONOR ENGAGEMENT:** These projects will attract new audiences and individuals into the Zoo fold. Both new and existing donors will be able to be engaged, cultivated, and stewarded in unimaginable ways.

ENTRY PLAZA & EXHIBITS

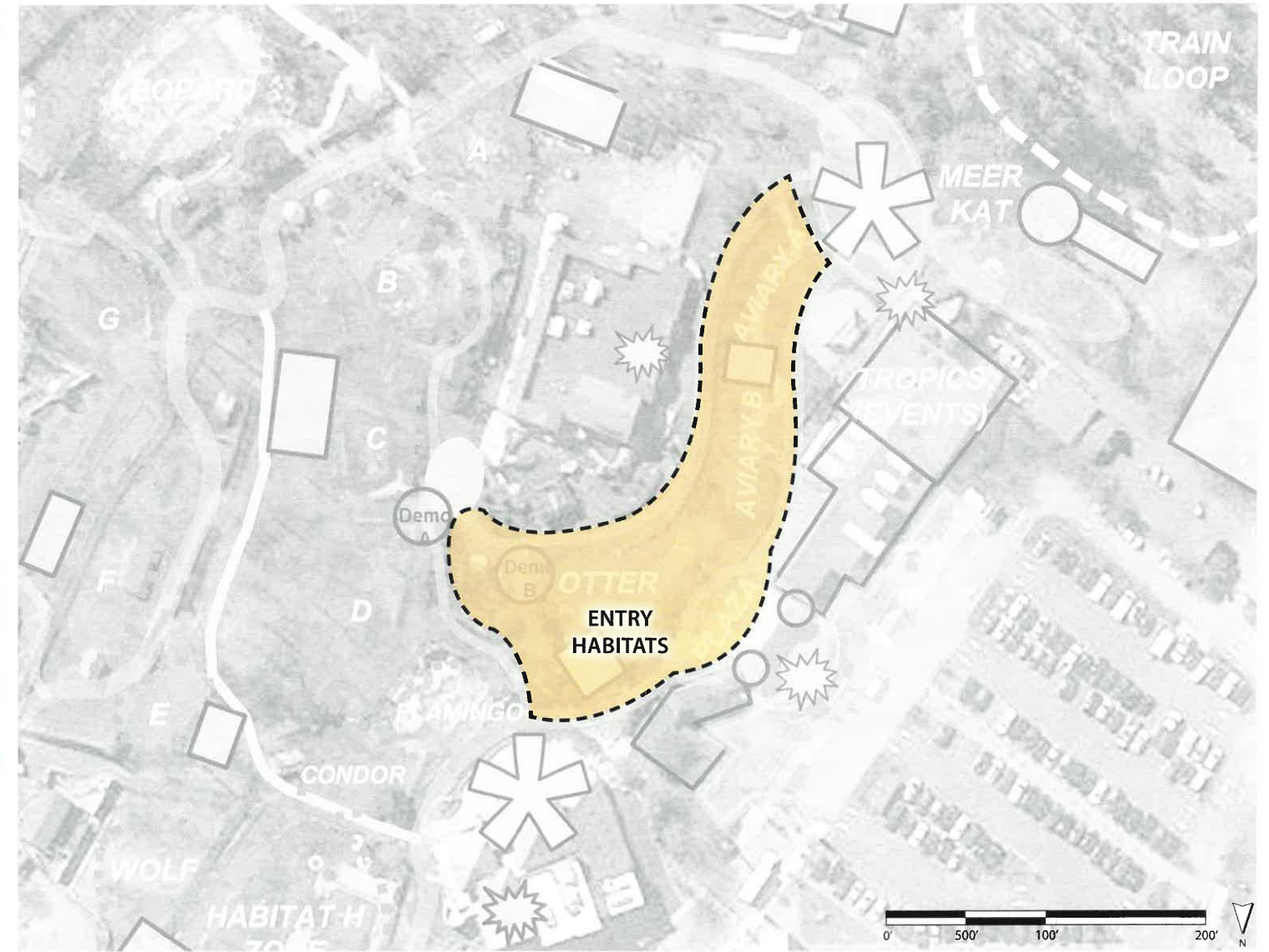
PRIORITY A PROJECTS - SHORT TERM

First impressions are important, not only in social interactions but also in human interactions with the built environment. A Zoo's front entry should not only stand to make a visual impact on the visitors, but it should also tend to the visitor's immediate needs and comfort by being accommodating to large crowds, providing visitor services, and incorporating animal experiences just beyond the gates. After all, the majority of the Zoo's income occurs at the entry with ticket, membership, and gift shop sales.

With attendance rising, the Turtle Back Zoo must consider capacity as a major design parameter in the overhaul of the front entry. Providing ample plaza space for visitors both inside and outside of the Zoo, as well as a well-defined and adequately sized gateway to welcome visitors, will set the tone for the guest's experience. Additionally, interior spaces for guest services and relations add to

the comfort of both the guests and the Zoo staff. These interfaces are often incorporated into spacious gift shops which utilize large windows for natural daylight and showcasing Zoo merchandise.

Finally, the overlay of animal habitats within the entry sequence will certainly add to the guests' experience. Imagine passing through an inviting sculptural gateway and be greeted by a group of highly active otters twisting a twirling through the cool blue water, or the sight and sound of large bird species about to spread its wings and take flight in an aviary, or primates brachiating above the plaza. With each of these concepts incorporated into the new front entry, the Turtle Back Zoo will certainly make a great impression on visitors.



EAST ZONE - NORTH AMERICA

PRIORITY A PROJECTS - SHORT TERM

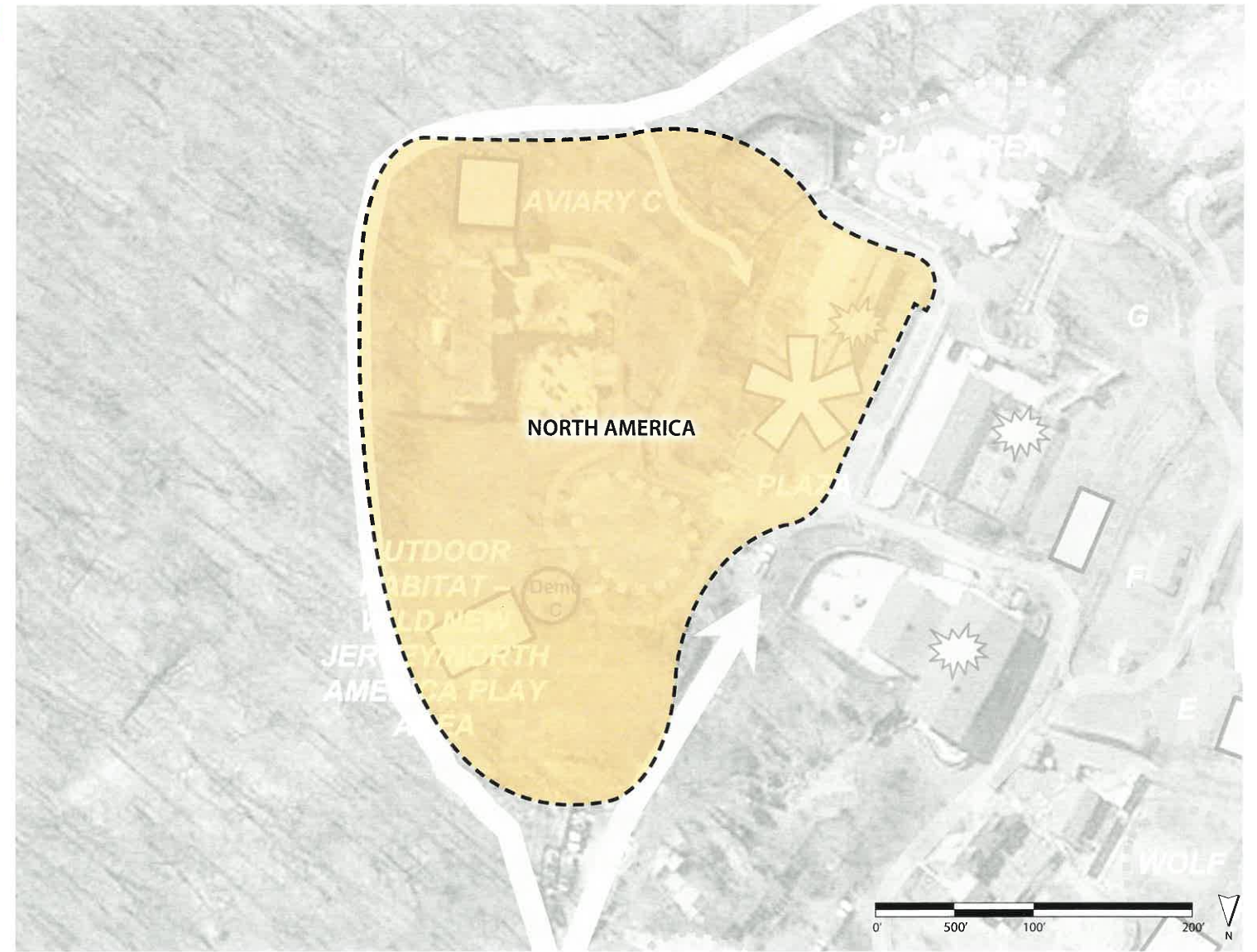
A hub can be defined as the effective center of an activity. In planning, especially that of zoological parks, hubs are often strategically located to act as a destination, define a geographic or species-specific region, create a sense of place, denote visitor activity and amenity, and act as a revenue enhancer.

During the analysis phase of the master plan, the design team recognized the East Zone of the Zoo as a potential activity hub as the site is spacious, in need of added programming, and well positioned along the visitor's journey through the Zoo. With the right balance of visitor amenity coupled with new and upgraded animal habitats, the East Zone will be revitalized into a hub of activity and prime destination for guests.

The pathways in the East Zone will be consolidated to define a plaza space or gathering point for the new activity hub. The plaza will be fitted with amenities such as food carts, rest rooms, and gift kiosks which will accommodate visitor needs as well as outdoor seating which will overlook animal habitats and increase stay time for guests.

The rural landscape at the South Mountain Reservation is a major asset for the Turtle Back Zoo. The East Zone is one of two areas within the Zoo where new major exhibits can be implemented utilizing the existing forest as a borrowed backdrop for naturalistic habitats. The East Zone is currently identified as a North America region within the Zoo and will continue to exhibit North American species.

Additional mesh enclosed habitats will infill underutilized areas within the landscape and begin to tie together the North America storyline by showcasing species both large and small in a wide range of naturalistic habitats.



CAMPUS PARKING ASSESSMENT - EXISTING CONDITIONS

PRIORITY A PROJECTS - SHORT TERM

As the attendance at the Turtle Back Zoo and interest in activities within the South Mountain Reservation (SMR) continue to rise, the parking infrastructure of the SMR must be inventoried, assessed, and programmed for increases in visitor capacity and parking demand. The SMR currently handles parking for the Turtle Back Zoo as well as the Richard J. Codey Ice Arena, Essex County Safari Mini Golf, McLoone's Boathouse, commuters, and other park users simply enjoying the green space, hiking trails and reservoir. This assessment focused on the parking zones identified for Zoo visitors. The approximate total existing parking stall count is 1,282.

Based on the parking assessment, the SMR is equipped to handle an annual attendance increase of up to 900,000 Zoo visitors. However, this is assuming that the parking lots identified for Zoo visitors are not consumed by other SMR users, which is seldom the case. Additional parking zones and/or parking structures must be identified to adequately handle the increase in attendance and busy days at the Zoo.

The zones identified in the diagram to the right are as follows:

- 1. Surface Lot at Zoo Entry** – This surface parking lot is closest to the main entry of the Zoo. It handles parking for approximately 130 vehicles as well as a drop-off zone for visitors attending the Zoo. It also handles circulation for Zoo service vehicles and visitor traffic. However, the surface lot itself is land-locked on all four sides. The only way to expand this lot would be to construct a parking structure. The disadvantages of a parking structure in this location are eliminating visual and physical connections between the Zoo's entry and the reservoir, and congesting the Zoo's front entry with additional traffic.
- 2. Ex. Garage (#1)** – This multi-level parking structure has a current capacity of approximately 525 stalls. It is designed to handle an addition of 1 floor which would add about 100 additional parking stalls.
- 3. Ex. Garage (#2)** – This multi-level parking structure has a current capacity of approximately 427 stalls. Zoo visitors must compete with daily commuters as well as attendees to the Richard J. Codey Ice Arena. This parking structure cannot be expanded in any way.
- 4. Unpaved Lot** – This remote grassy field acts as an overflow

parking zone for Zoo visitors. Its estimated capacity is approximately 500.

Zones 1, 2, and 3 are near the Zoo's main entrances. Zone 4 is remote and requires a shuttle or a strong pedestrian link to the Zoo via the SMR's reservoir.

EXISTING PARKING			
Key	Zone	Spaces	Spaces
1	Surface Lot at Zoo Entry	130	130
2	Ex. Garage #1	525*	420
3	Ex. Garage #2	427*	340
4	Unpaved Lot	500	
Total Spaces		1,282*	890

* Although these garages provide capacity, competing uses diminish availability of these spaces for zoo use. See second column above which assumes 80% of capacity and dedicated paved parking.

SAMPLE ORDER OF MAGNITUDE PARKING ASSESSMENT		
1) Design day = 1% of annual attendance		
2) Design day = 9,000 or more		
3) Parking demand = design day x 80% / 3.5 Per car / 1.5 to 1.75 Turnover		
ANNUAL ATTENDANCE	DESIGN DAY	PARKING DEMAND*
900,000	9,000	1,175 to 1,371 Spaces
1,000,000	10,000	1,306 to 1,523 Spaces
1,100,000	11,000	1,436 to 1,676 Spaces
1,200,000	12,000	1,567 to 1,828 Spaces

* Quantity based on turnover range. Paved parking spaces, overflow parking spaces, and street parking.

It's important to note that while the "total existing parking stall count" is 1,282 a further breakdown of this assessment assuming 80% capacity of the garages and only accounting for dedicated paved parking is closer to 890 spaces. This confirms the Turtle Back Zoo's current issue with parking capacity. The Zoo is only able to provide parking for approximately 75% of guests before resorting to off-site locations. Even with off-site locations utilized, the Zoo is operating just at capacity. The current parking availability will not support increases in attendance beyond 900,000 visitors.






OPPORTUNITIES

In a site restricted by numerous spatial and environmental constraints, a methodical approach to achieving the required parking demand with the smallest environmental footprint is to construct a multi-level parking structure. This opportunities diagram tests construction of a parking structure in each zone to yield the greatest increase in parking capacity.

- Garage at Zoo Entry** – As stated on the existing conditions plan, constructing a parking structure in this location would yield more negatives than positives from an environmental and Zoo operational standpoint. Renovations to the front entry to handle the increase in visitor attendance will be greatly impacted. The visitor's experiential approach to the Zoo's main entry will be compromised with this heavily structured parking option. Additionally, this parking zone has very limited ingress and egress for vehicles therefore leading to increased traffic circulation issues.
- Renovate Ex. Garage #2** – Utilize this parking structure's ability to expand and yield an additional 100 stalls.
- Park N' Ride Garage** – This structure will remain as is.
- Parking Garage #3** – Turtle Back Zoo has embarked on the construction of a 500-car parking structure in the service area of the facility. By using the Zoo service area, minimal impact is made to the surrounding environment. Furthermore, the service area was in need of an upgrade and will now be housed in the lower level of the parking structure. Changes to the egress and ingress from Northfield Avenue are also part of this project.
- Special Event Parking** – Maintain the unpaved lot for special events and special event parking for the South Mountain Recreation Complex.

Comments indicate "Legend" and "Surface Parking" to be deleted, but I think it was a mistake? There was no additions/replacements provided

Legend	
	Surface Parking Lot - Paved or Unpaved
	Parking Structure (garage) - Proposed or Renovated Existing
	Parking Structure (garage) Existing to Remain As Is

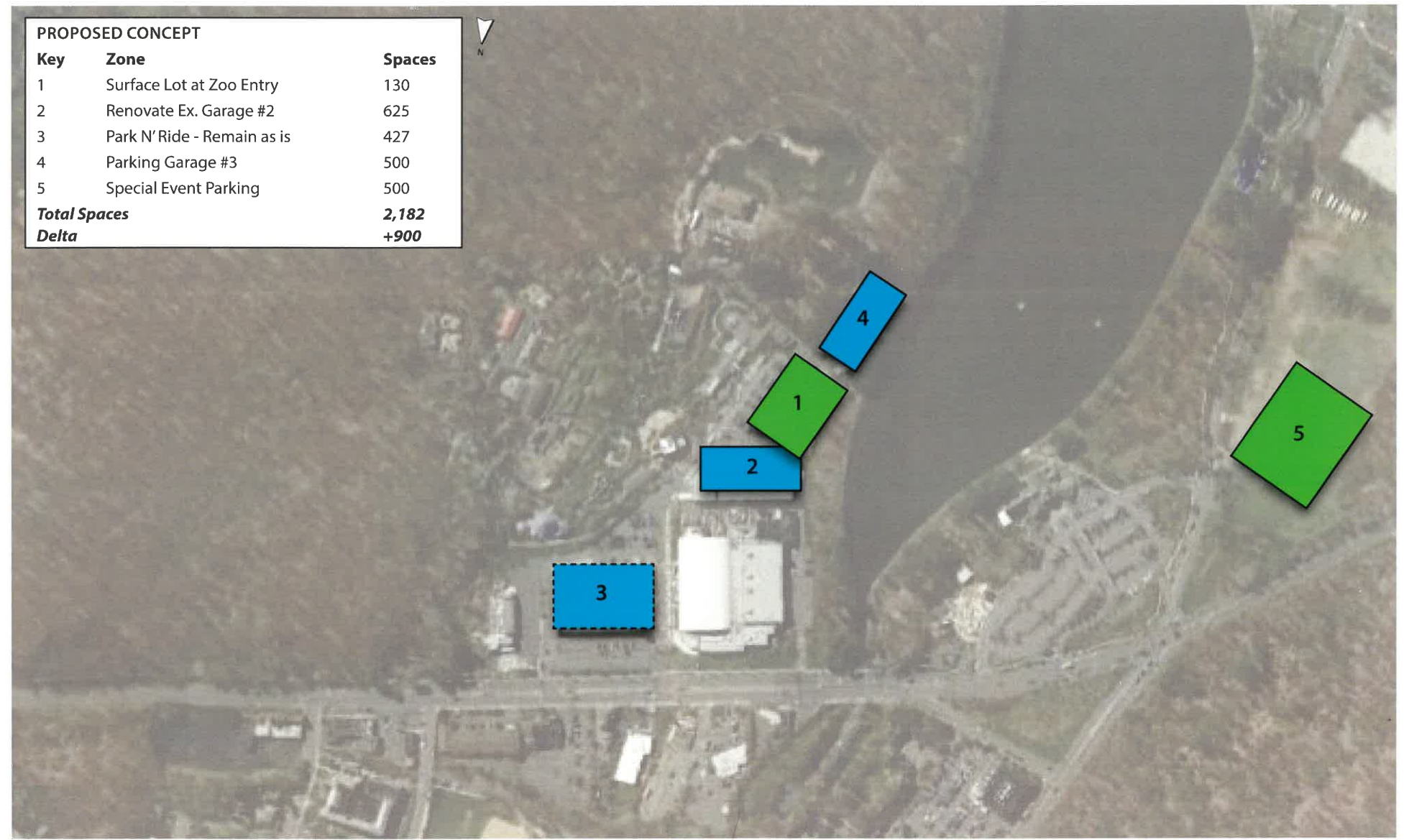
CONCLUSION

After weighing the pros and cons of each parking zone opportunity, the parking expansion concept below strikes the appropriate balance between accommodating the demand while lessening both environmental and experiential impacts on the site and visitor respectively. The total parking spaces available is estimated at 2,182, a delta increase of approximately 900 from the existing parking stall quantity.

With this amount of available spaces, the Zoo may be able to handle visitor attendance increases while still providing parking for other users of the South Mountain Recreation Complex

It is recommended that a complete traffic study be conducted for the SMR and surrounding areas of influence. Such a study will confirm assumptions made in this assessment and assist in the decision making process which will help to benefit the SMR, Turtle Back Zoo and nearby residents of Essex County.

*See Turtle Back Zoo Environmental Assessment Traffic Analysis, August 9, 2018

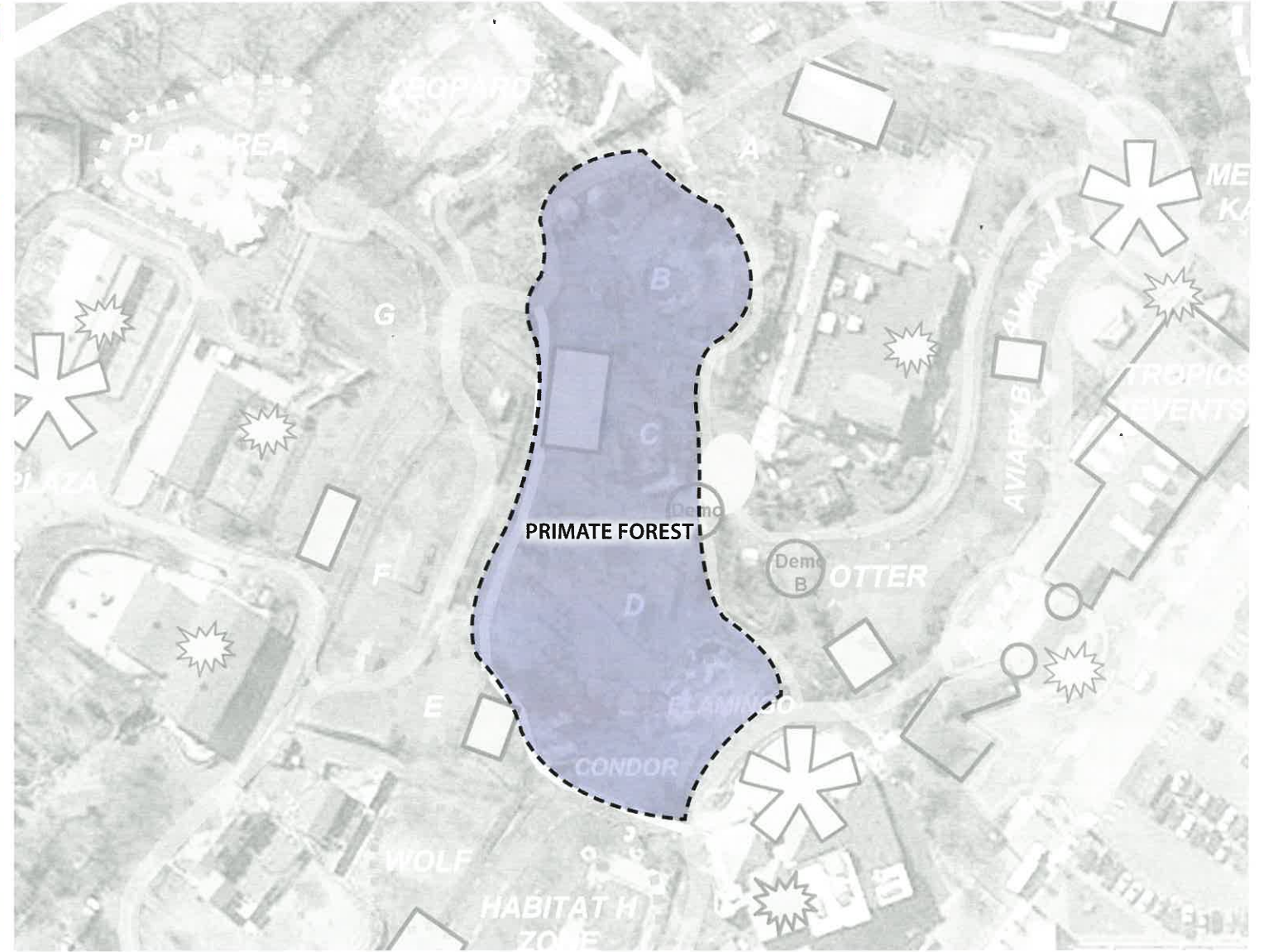


PRIMATE FOREST

PRIORITY B PROJECTS - MID TERM

During the master planning process, existing and proposed land use as well as the topography is studied critically to gain an understanding of site opportunities for future development. The central exhibit zone at the Turtle Back Zoo contains outdated exhibits that are in critical need of renovation to elevate the zoo's standards for animal care. Additionally, visitor circulation within the central exhibit zone is circuitous and confusing. This analysis coupled with the sloping topography of the site helped the design team visualize the potential land use for a series of arboreal primate exhibits which will utilize narrow yet vertical habitats, provide unique viewing opportunities for visitors, and reinvigorate this central zone from the existing gibbon habitat down to the entry and café.

Primate Forest will re-envision this outdated and underutilized exhibit zone as a sequence of immersive habitats which will showcase the unique arboreal characteristics of primates to an enamored crowd. The mesh enclosures will be connected to aerial chutes which will allow for flexibility in animal management as species such as Gibbon, Langur, Orangutan, and Mandrill may occupy the same habitat spaces on a timeshare basis. The aerial chute systems will not only serve as a means for animal transfer but also act as an exhibit itself, allowing primates to demonstrate their ability to climb, swing, perch, and brachiate high within the forest canopy. Visitors will be able to enter an indoor / outdoor viewing shelter where feeding demonstrations between animals and keepers will take place.



AUSTRALIA OUTBACK & NATURE PLAY

PRIORITY B PROJECTS - MID TERM

The concept of overlaying habitat viewing experiences with interactive play zones is effective in conveying an interpretive storyline. These storylines can help reinforce messages of conservation to both adults and children alike. The new Australia & nature play zone will provide a retreat for children to view, explore, play, and learn about the critically endangered species from the land down under.

The new Australia Outback & Nature Play will breathe new life into an aging South American exhibit sequence which has been with the Zoo for over 25 years. The Australia project will re-envision the habitat spaces for the current Kangaroo and Emu species as well as see to a new habitat sequence which will provide up-close views of the vulnerable Cassowary and the critically endangered Tree Kangaroo.

Visitor pathways will be redirected to yield larger habitat zones while the service corridors will be consolidated to separate visitors from service vehicles. The sloping landscape will create an ideal Tree Kangaroo habitat as vertical elements can be incorporated within the exhibit to set up perch points. Visitors will enter an interpretive elevated treehouse which will offer up close immersive views of the habitat.

The existing prehistoric playground will be renovated and enlarged to incorporate more interpretive nature play elements that will promote learning by combining the elements of play with animal interactions. Keeper demonstrations will occur throughout the play zone to provide an interactive component to the program.



SOUTH CAMPUS AFRICAN ADVENTURE EXHIBIT

PRIORITY C PROJECTS - LONG TERM

Over the last two years, the Turtle Back Zoo has focused its efforts towards the south and opened several major African themed projects which have brought many new species to the zoo and captured the interest of visitors. With the desire to diversify the animal collection while capitalizing on the success of the initial African exhibit, the master plan tests the implementation of Africa Phase II which will include new hoofstock species such as Zebra and Eland as well as other mammal species. It will also overlay necessary strategic visitor components to incorporate another visitor activity hub as well as an experiential train ride and habitat theater.

The South Campus African Adventure Exhibit is poised to be on the forefront of exhibit design showcasing mixed species habitats and activity based design which will exhibit multiple non-predator species together just as they would appear in their natural habitats.

By strategically positioning habitats and understanding their adjacencies, we will be able to create linkages between them which will promote movement and activity as animals will forage for food, gather in herds, and partake in other natural behaviors.

The African hub will feature a new state of the art café and event facility providing unique dining experiences and visitor overlooks into the expansive savanna habitats. The hub will serve as a destination along the visitor's African journey. The existing train route will be relocated to accommodate new animal habitats and positioned to set up views of exhibits along the route. The conservation pavilion will provide educational opportunities and exhibit a variety of ambassador species.



TROPICS

PRIORITY C PROJECTS - LONG TERM

A visit to the Turtle Back Zoo should offer a carefully choreographed array of experiences which include interior as well as exterior spaces for visitors to view and encounter animals. The newly envisioned tropics building in place of the aging reptile house adjacent to the Zoo's front entry is the perfect location and opportunity for a state-of-the-art indoor experience.

The new tropics building will offer up-close views and interactions with many reptiles, primates, and other tropical species both inside

and outside of the building. Located off the plaza on the north end of the Africa exhibit, the tropics building will contribute to a new hub of activity in what will become the new "center" of the Zoo. The gardens to the south of the tropics building will provide both a visual and physical link for visitors traveling to and from the zoo entrance as well as offer an opportunity for additional outdoor venue rental options.



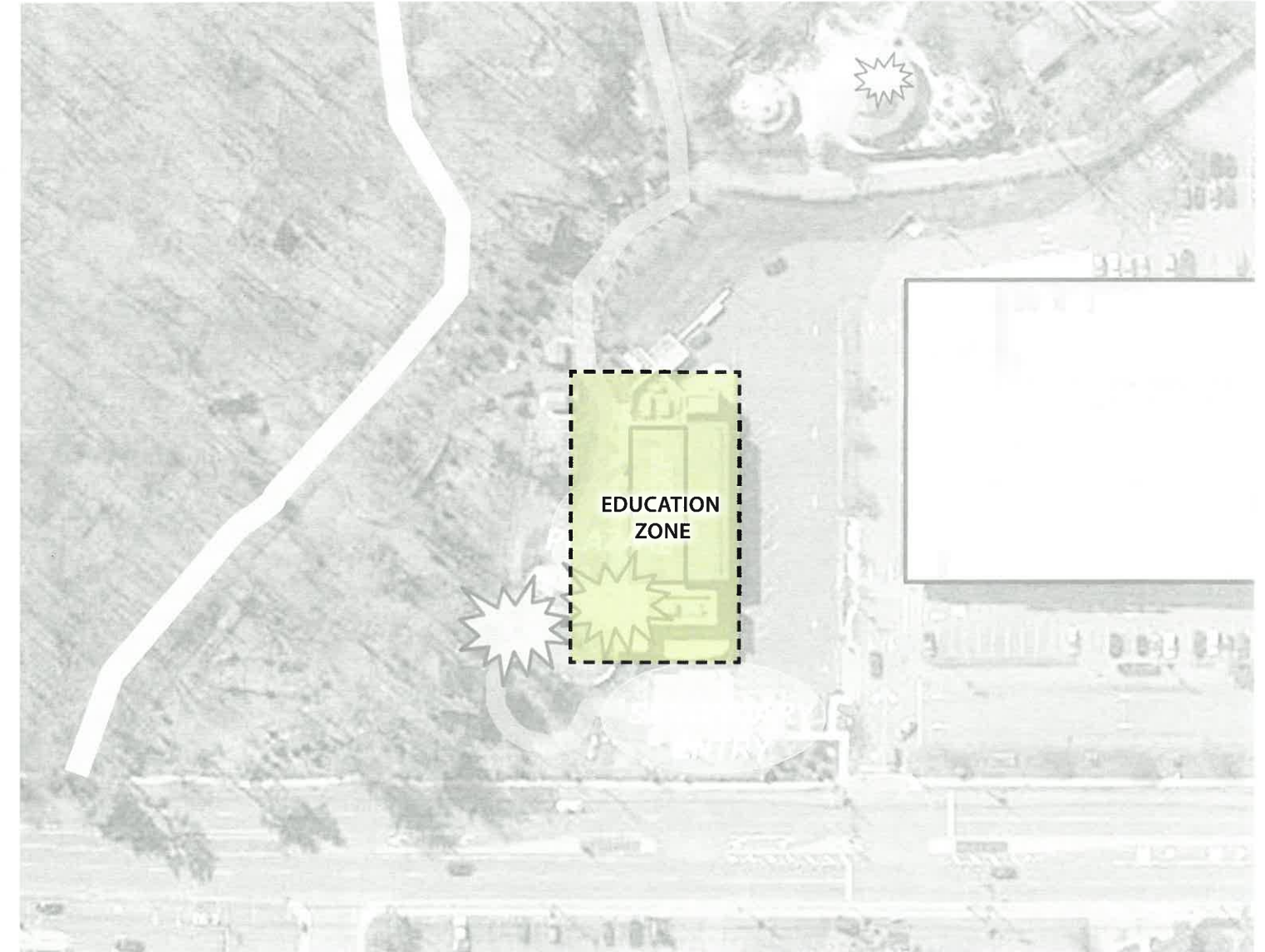
CONSERVATION EDUCATION

PRIORITY C PROJECTS - LONG TERM

In 2014 the Turtle Back Zoo invested in a new education building to accompany the addition of a secondary Zoo entry and ropes course. From there the education program at the Zoo flourished. Now, only a mere five years later, the education program is looking to expand beyond the footprint of the current building to accommodate the demand and elevate the program to the next level.

The current education building would benefit from an addition to its east side which will add new indoor classrooms and common space as well as adjacent unique outdoor classroom space for impromptu gatherings. While the nexus of the education program is located indoors at the Zoo's secondary entry, the idea of education can be incorporated throughout the Zoo at both micro and macro levels. Grand concepts may be a common thread through most of the zoo's exhibitry and experiences while finer details may be woven into the natural surroundings like tagging trees with botanical names, providing butterfly walk-throughs, or showcasing insects, a vital component to the local flora and fauna of an ecosystem.

If the Turtle Back Zoo can set the stage for unique educational opportunities, children will use their creativity and inherent playful abilities to activate the spaces. Zoo's are the perfect venue for education and it's important to make the most of their ability to connect visitors to nature and set apart from the typical school environment common in most education systems.





EXISTING LAND USE PLAN

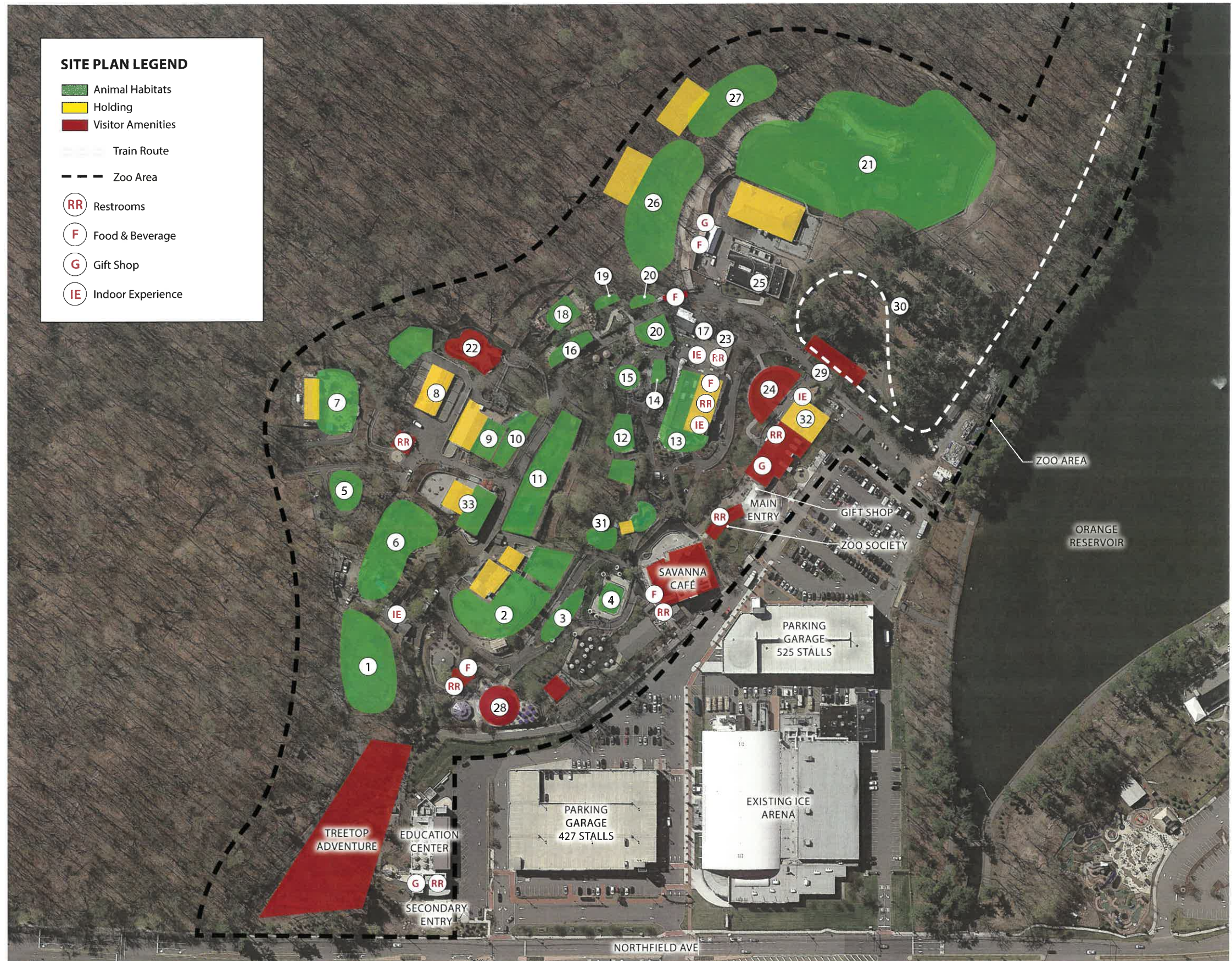


PROGRAM

1. Bear Habitat
2. Bison
3. Maned Wolf & Anteater
4. Hawk
5. Prairie Dog
6. Wolf
7. Eagle Habitat
8. Cougar & Jaguar Habitats
9. Petting Zoo
10. Aviary
11. Kangaroo, Wallaby & Emu Habitats
12. Rhea, Llama & Capybara Habitats
13. Turkey
14. Otter
15. Flamingo
16. Seal, Sea Lion & Touch Tank
17. Aquarium
18. Alligator
19. Red Panda
20. Gibbon & Pheasant Habitats
21. Leopard
22. Muntjac
23. Crane
24. African Adventure (Mixed Species)
25. Prehistoric Playground
26. Sea Turtle Recovery
27. Original Amphitheater
28. Animal Hospital
29. Lion and Hyena Exhibits
30. Penguin (new)
31. Carousel
32. Train Station
33. Train Tracks
34. Condor
35. Reptile
36. Pony Rides

SITE PLAN LEGEND

- Animal Habitats
- Holding
- Visitor Amenities
- Train Route
- Zoo Area
- RR Restrooms
- F Food & Beverage
- G Gift Shop
- IE Indoor Experience



INVENTORY & ANALYSIS SUMMARY

This inventory and analysis summary provides a detailed observation report of the existing issues and opportunities present at the Turtle Back Zoo. By grouping the observations into similar planning categories, it is apparent that the Zoo currently faces issues related to: circulation, capacity, land

use, and visitor amenity. These observations coupled with the building and exhibit inventory, circulation, project implementation, and planning overview diagrams will drive the final direction of the overall master plan and implementation diagrams.

CIRCULATION

- (A) Vehicular circulation is confusing, visitors are forced to circulate back onto Northfield Ave in search of parking on campus
- (D) Existing Ice Arena and parking structures obstruct views of Zoo's main entrance
- (F) Zoo's secondary entry is remote and disconnected from visitor circulation from parking, lacks safe pedestrian route from parking lots
- (G) Make a strong pedestrian connection between reservoir path and Zoo entry
- (K) Original Amphitheater experience disturbed by circulation
- (O) Pathway is a long dead end
- (S) Circulation is redundant; consolidation could allow for more habitat space
- (V) Pathway obstructed by seasonal walk-through exhibit
- (Z) Visitor/Service circulation conflicts; shared paths to service Zoo's inner exhibits can be unsightly for visitors
- (AA) Opportunity to continue service road to back of house
- (DD) Must maintain connection to east side of reservoir for additional parking

CAPACITY

- (B) Busy days at the Zoo exceed campus parking capacity, reservoir users park in garages
- (C) Parking garage can be expanded by one floor to increase park capacity by approximately 100 stalls

- (E) Zoo's main entry and gift shop is undersized for accommodating large crowds on busy days
- (J) Zoo's entry court is undersized to receive crowds coming through the gate; also no animal experience upon entrance
- (L) Original Amphitheater undersized and unable to accommodate special events, e.g. weddings
- (FF) Employees currently park off site

LAND USE

- (H) Take advantage of views into reservoir
- (I) Service zone located on prime "waterfront" property
- (Q) Zone suitable for new exhibits
- (R) Habitats are dated and too small, circulation in confusing and circuitous
- (T) Opportunity for habitats on hillside
- (CC) Heavily forested hillside is great as a landscape backdrop for animal exhibits

EXPERIENCE / VISITOR AMENITY

- (W) Exhibit zone lacking in visitor amenity
- (X) Great sequence of immersive exhibits
- (Y) Sizable picnic zone located in shade, good adjacency to café; good controlled access points
- (EE) Utilize café and exhibit adjacencies to create views for visitors while dining
- (M) Train Route should capitalize on views into exhibits; it currently does not
- (P) Provide visitor food amenity (furthest point from café)

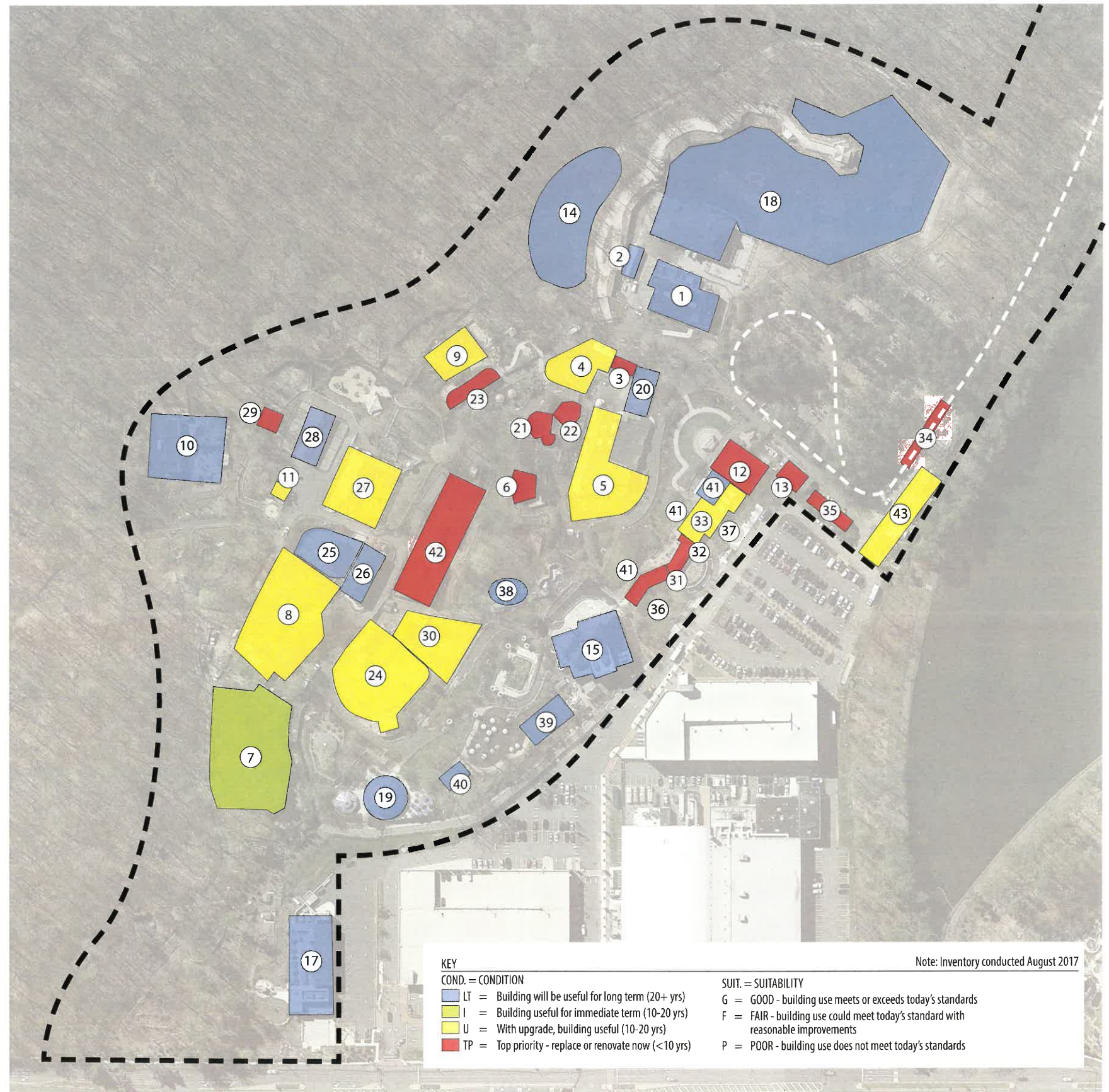


EXISTING BUILDING AND EXHIBIT INVENTORY



#	Exhibit/Building	Square Ft	Year	Condition	Suit.
1	Hospital	6,800	2005	LT	G
2	Hospital Shed	900		LT	G
3	Pheasant Exhibit	250	1963	TP	P
4	Gibbon Exhibit	835	2008	U	F
5	Sea Lion Exhibit	9,800	2012	U	F
6	Otter Exhibit	375	1999	TP	F
7	Bear Exhibit	1,200	2004	I	F
8	Wolf Exhibit	1,500		U	F
9	Leopard Exhibit	856		U	P
10	Big Cat Exhibit	1,950	2011	LT	G
11	Big Cat Bathroom	528	2011	U	G
12	Reptile Exhibit	4,200		TP	F
13	New Barn	3,000		TP	F
14	Lion/Hyena Exhibit	2,700	2017	LT	G
15	Café	16,000	2016	LT	G
16	Old Education Building*	4,300		U	G
17	New Education Building	16,445		LT	G
18	Giraffe Exhibit	7,000	2016	LT	G
19	Carousel	2,700	2007	LT	G
20	Sea Turtle Rescue		2017	LT	G
21	Alligator Exhibit	194		TP	P
22	Aquarium	820		TP	P
23	Red Panda Exhibit	100		TP	F
24	Bison Exhibit	2,100		U	G
25	Pony Barn	1,750		LT	G
26	Pony Covered Area	3,024		LT	G
27	Barn/Aviary	2,592		U	F
28	Barn	3,360		LT	G
29	Barn Hay Storage	420		TP	P
30	Maned Wolf / Anteater	675		U	G
31	Ticketing 1 (Next to Guest Services)	300		TP	P
32	Ticketing 2 (Next to Gift Shop)	300		TP	P
33	Gift Shop / Zoo Society	2,300		U	F
34	Train Barn	2,200		TP	P
35	Maintenance Bay	1,400		TP	P
36	Group Sales Area	225		TP	P
37	Zoo Society Offices	300		TP	P
38	Condor Exhibit	192		LT	G
39	Large Picnic Pavilion	3,654		LT	G
40	Small Picnic Pavilion	1,550		LT	G
41	Restrooms (Near Ticketing)	740		LT	G
42	South America Exhibit			TP	P
43	Storage Sheds & Freezer			U	F

* Not represented on plan



KEY
COND. = CONDITION
 LT = Building will be useful for long term (20+ yrs)
 I = Building useful for immediate term (10-20 yrs)
 U = With upgrade, building useful (10-20 yrs)
 TP = Top priority - replace or renovate now (<10 yrs)

SUIT. = SUITABILITY
 G = GOOD - building use meets or exceeds today's standards
 F = FAIR - building use could meet today's standard with reasonable improvements
 P = POOR - building use does not meet today's standards

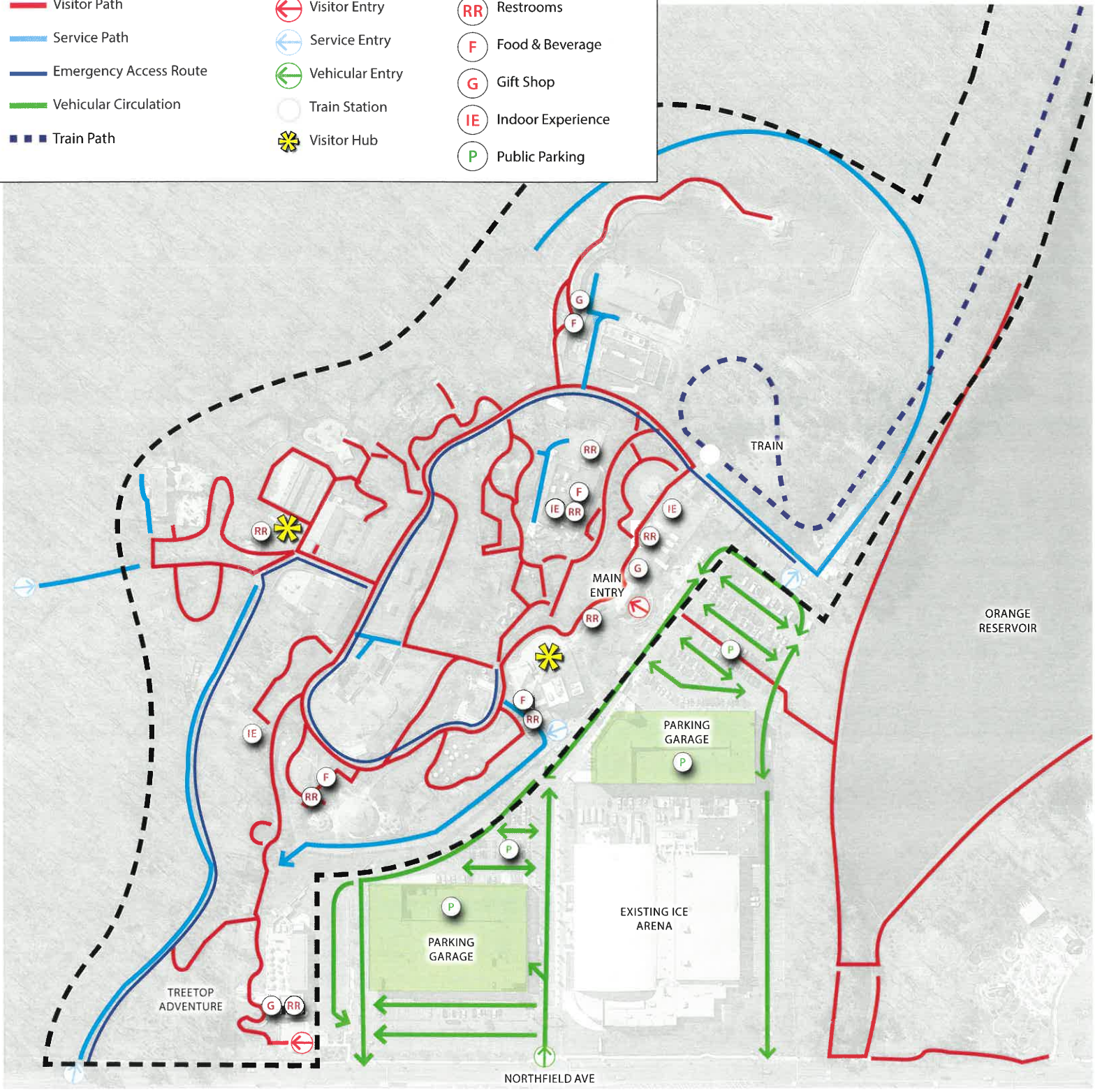
Note: Inventory conducted August 2017

CIRCULATION



SITE PLAN LEGEND		
—	Visitor Path	RR Restrooms
—	Service Path	F Food & Beverage
—	Emergency Access Route	G Gift Shop
—	Vehicular Circulation	IE Indoor Experience
- - -	Train Path	P Public Parking
↻	Visitor Entry	○ Train Station
↻	Service Entry	✦ Visitor Hub
↻	Vehicular Entry	
↻	Train Station	

EXISTING CAMPUS CIRCULATION



PROPOSED CAMPUS CIRCULATION

