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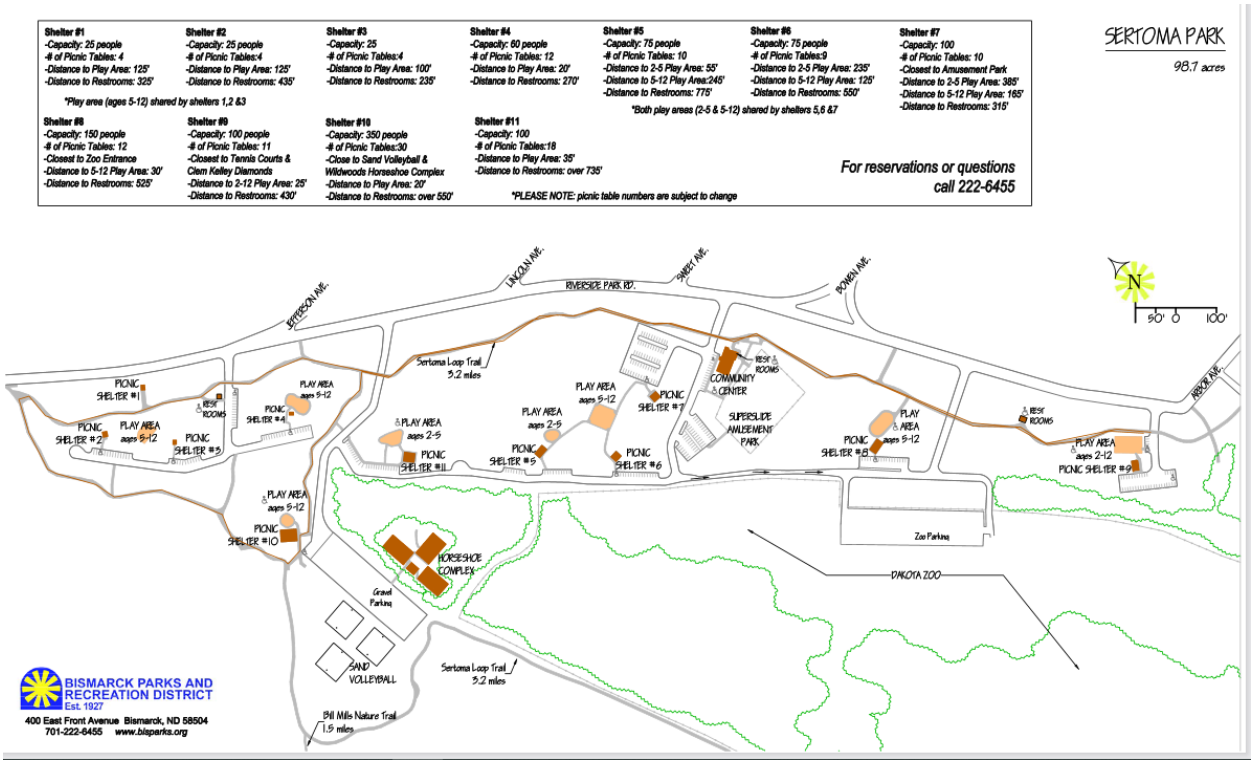
GEOG 777
Project 2 Final Report
November 17, 2020



Sertoma Park Explorer

Sertoma Park is located along the Missouri River in Bismarck, North Dakota. The 98.7 acre park is one of the best and most popular parks in town. Its location along the Missouri River, multitude of amenities coupled with other nearby recreation facilities such as the Dakota Zoo, Superslide Amusement Park, and proximity to Clem Kelley Softball complex make it one of the most popular parks in town. Sertoma Park is maintained by Bismarck Parks and Recreation District. The park, although quite large by Bismarck standards, does not currently have an online or mobile map to explore the parks features. The PDF shown above, is the only online map of this popular park.

For project 2, my focus for the user experience is the perspective of seeking accessible features within the park; maybe I'm a parent of a child in a wheelchair; I have a mobility impaired grandparent; or based on my own experience when my children were younger: I'm a Mom of a toddler and a 6 years old; depending on the equipment in a playground it can be the difference between a super boring playground or one that both kid will want to play at all day! Making sure a public play space is accessible to all–not only for children of varying abilities, but for parents, grandparents, and caregivers with different physical conditions–helps ensure a playground that is a healthy community gathering

spot[1]. An application focusing on accessibility aspects of the features in the park can also help park managers determine features that need upgrading to meet current Americans with Disability Act (ADA) standards[2]. Playgrounds undergoing renovation or alteration after March 15, 2015 are subject to review to meet ADA requirements; all new construction or alterations of existing playgrounds must utilize the 2010 Standards.

Bismarck Parks and Recreation District has made a concerted effort to make their facilities accessible, documenting types of accessibility features available at the city's playgrounds[3]. This information was extremely helpful in creating the data used in my application. However, even though Bismarck Parks has parks on ArcGIS online, none of the details on the PDF are contained in the online feature services. Information about playground accessibility is on a PDF document; not downloadable. I added accessibility information as attributes for the playground points digitized for this project.

USER EXPERIENCE and DESIGN

Table 1 is the user personas developed for the application and the possible interactions the application may have. From personnel experience of trying to find one playground that would make both a toddler and a 6 year old happy, selecting playgrounds by age group was the first filter for discovering playgrounds. Data contribution in the form of a user-submitted comment at a point was deemed the most user-friendly and approachable for the public.

Accessibility was considered in both the front end and back end design. In the front end, colors for the application were selected from the Bismarck Parks and Recreation website. The colors convey a playful mood reinforcing the play-focused aspect of the application. Colors selected are also color blind safe. Point features on the map are identified by shape, rather than color alone to also help keep the application color blind safe. Restrooms, were distinguished by color based on their accessibility, but the colors selected (blue and yellow) are considered color blind safe. And although I am a (very) novice web developer, I did try to include as many elements as my skills could

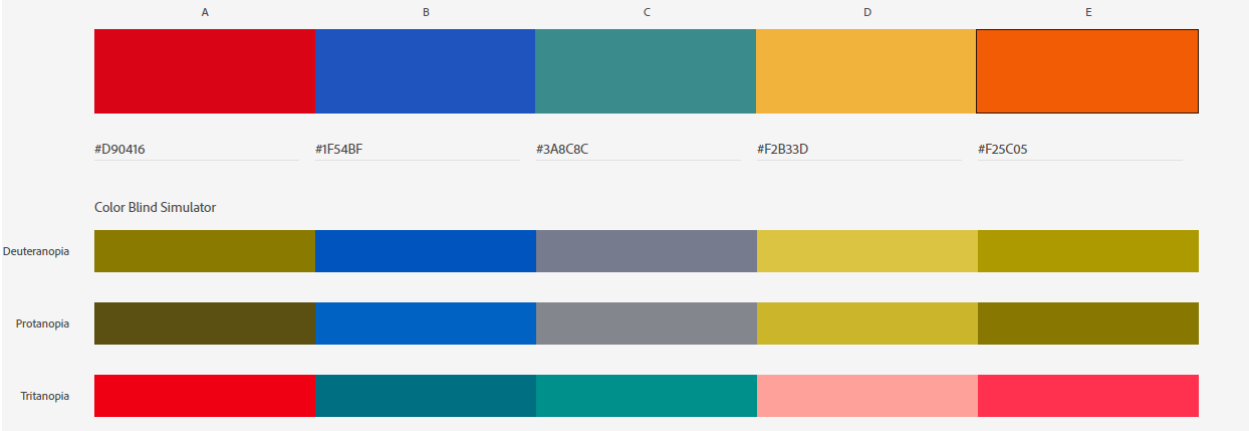
[1] https://www.playitsafeplaygrounds.com/playground-planning/understanding-ada-access-on-your-playground-what-is-required/ Accessed 10-Oct-2020.

[2] US. Department of Justice, September 15, 2010, https://www.ada.gov/regs2010/2010ADAStandards/Guidance_2010ADAStandards.pdf; (accessed 11-Oct-2020)

[3] https://www.bisparks.org/wp-content/uploads/2020-BPRD-Playground-ADA-Inventory.pdf (accessed 12-Oct-2020

successfully incorporate to assist in screen readers and adaptive technology[4]. Elements such as a meaningful title, making sure dropdowns can be tabbed through, and ARIA usage for toggling elements was incorporated.

	HEX	RGB
RED	#D90416	217, 4,22
BLUE	#1F54BF	31,84,191
TEAL	#3A8C8C	58,140,140
YELLOW	#F2B33D	242,179,61
ORANGE	#F25C05	242,92,5



[4] https://section508.gov/content/guide-accessible-web-design-development#page_title (accessed 5-Nov-2020

TABLE 1. USER PERSONAS

User Persona	User Goal(s)	Functional Goal(s)	Ability and motivation	Technology Interface
Mindy Mom and David Dad of young child in wheelchair or child who walks with braces	● Find playgrounds her wheelchair bound child can play on. ● Discover shelters to reserve for outdoor party that has tables that can accommodate wheelchair ● Find playgrounds that meet needs of other children in family; younger and older	● Query playgrounds by age appropriateness ● View aspects of park ahead of time	● Educated ● Has experience and comfortable with tech ● Highly motivated – their child loves to be outside!	● Desktop + mouse ● mobile
Grandpa George	• Loves to play with his grandkids, but isn't so steady on his feet • Hard for him to bend or stoop over (ramps to play equipment would be helpful)	● View park by surface type. ● Maybe interested in taking the kids to other features of the park.	● What's underfoot is important; wood chips don't work with a walker ● Handy with a computer, but not so much with those tiny phones.	● Desktop + mouse ● mobile
Accessibility Andy	• Accessibility Advocate • Make sure public spaces are accessible • Can be a PITA to city council members; park boards.	• Submit comments to park manager • Query	• Educated; savvy with the cell phone • ADA Advocate	• Desktop + mouse • mobile
Melina P.R. Manager	● Ensuring public input is easy ● Updates data and maps ● Forwards concerns to park maintenance. ● Wants to make sure that the Accessibility Andys of the world can have their voices heard	● Query ● View comments	● Educated ● Concerned about public perception	● Desktop + mouse ● mobile

Representation Layers

LAYER NAME	SOURCE DESC	SYMBOLIZATION DESC
Bathrooms	Original digitized dataset	Point, symbolized by accessible access blue = T; yellow = F 
Playgrounds	Original digitized dataset	Point; single symbol 
Shelters	Original digitized dataset; https://www.bisparks.org/parks-trails/shelter-descriptions/	Point; 
Trails	Original digitized dataset	Line; symbolized by surface type (gravel, asphalt, concrete)
Comments	User submission	Point; Maintenance; accessibility concerns; comments 
Basemap	Carto Voyageur	Default

Interaction

FUNCTION	OPERATOR	INTERACTION BEHAVIOR
On click	onClick, mouse click	Opens a pop-up about feature clicked; especially if features have already been filtered by age or accessibility options. URL for more information available for some features.
Pan	Grab and drag pan	Navigate to location of choice by mousing
Zoom	Zoom +/- button Grab and drag zoom	Zooms to desired location
Query playground by age	Select dropdown	View playground(s) based on age group (2 to 5, 2 to 12, 5 to 12)
Sort Shelter by accessibility options	Select dropdown	View shelter(s) with accessible seating (true or false)

Submit Comment	Onclick	Select type (trail, playground, shelter or restroom) then dialogue or pop-up for comment
Search for POI	Select dropdown	Search for point of interest category (art, athletic complex, recreation or zoo)
User Location	On click	Marker highlight

DATABASE DESIGN

The entity-relationship diagram of the database design represents the organization and interactions of the features in the database. Users can submit comments about anything, but will be given an option to submit comments about specific features within the park. Although Bismarck Parks does have an ArcGIS Online presence, the park features are not available for download individually, and do not contain the level of detail necessary for my application. I used ArcGIS Desktop 10.7.1 to digitize the feature locations and enter attribute information for the features in to a geodatabase. The individual feature classes were then uploaded into Carto database.

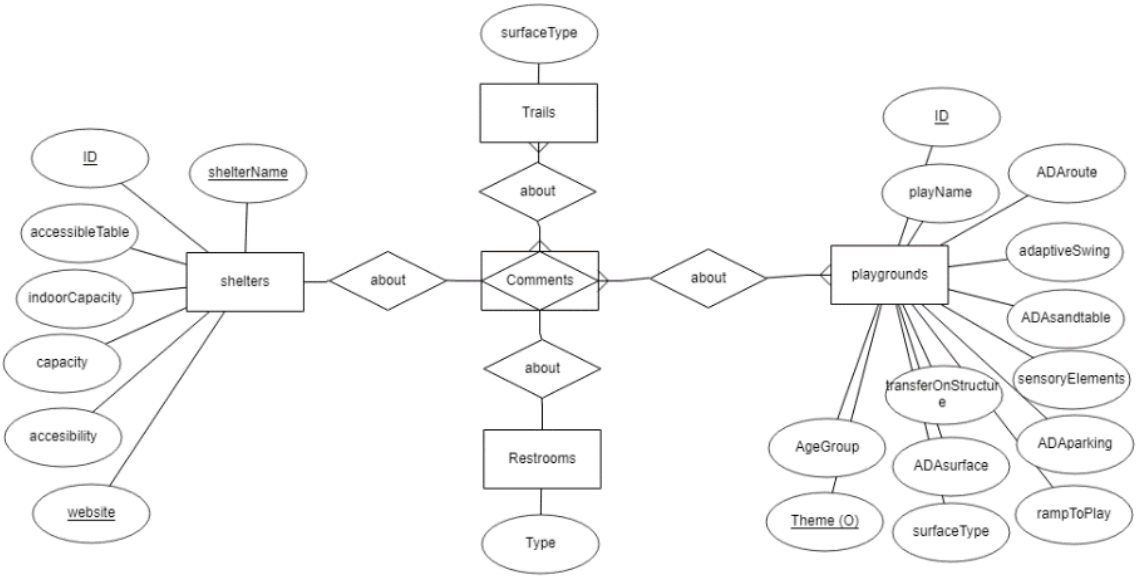


Figure 1. Entity-relationship diagram of Sertoma Park database

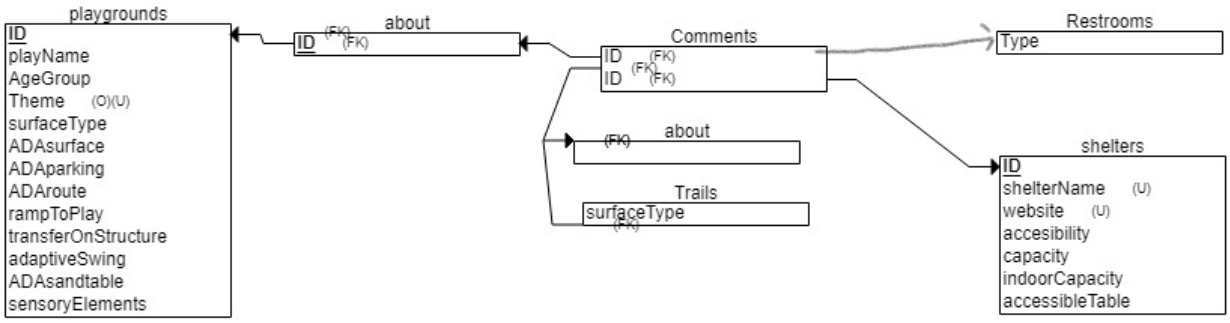


Figure 2. Relational schema of Sertoma Park database.

Development stack:

ArcGIS Desktop 10.7.1 for geospatial development, digitizing

CARTO, PostGIS and Leaflet for representation and web map development