

ACTIVE TRANSPORTATION
RECOMMENDATIONS

FOR

FORT PIERRE
SOUTH DAKOTA

SOUTH DAKOTA STATE UNIVERSITY
LANDSCAPE ARCHITECTURE PROGRAM
WITH THE
SOUTH DAKOTA DEPARTMENT OF HEALTH

APRIL 27, 2016

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Introduction

The built environment affects public and personal health. This fact has been proven time and again through studies, interviews, surveys, and mockups the world over. In addition to physical indicators of health, like measuring obesity, calorie intake, and steps walked in a day, there are less-tangible indicators of a community's health. These include perceived friendliness, sense of community, and livability. The built environment impacts all of these indicators.

In 2012, the South Dakota Department of Health initiated the Active Transportation Advisory Team (ATAT) to facilitate change in the built environment of South Dakota. In particular, an effort has been made to help communities encourage using alternative means of transportation (such as walking or cycling) for completing one's daily routine. An outgrowth of the ATAT work is the Active Transportation Collaboration project. This project provides resources and expertise to one or two South Dakota communities each year in developing strategies to improve active transportation.

Recommendations are developed over the course of a 16-week semester by students from the South Dakota State University Landscape Architecture program. In the case of the present study, students traveled to Fort Pierre, South Dakota, in late January 2016 to conduct interviews with key stakeholders within the community, including the mayor, members of city council, other city officials, and leaders of local industries and grassroots groups. Students also conducted an analysis of transportation infrastructure, parks and recreation facilities, and neighborhood composition.

After conducting these interviews and analysis, students developed a series of recommendations touching all aspects of active transportation issues, including the further development of active transportation infrastructure such as bike paths, on-street bike lanes, and sidewalks, mitigation of adverse effects of vandalism and air and noise pollution, and enhancement of existing parks facilities. By approaching active transportation in this holistic way, it is hoped that a balanced, comprehensive plan for improving public and personal health can be achieved.

These recommendations represent a global shift in how people think of their community. Some recommendations represent a major financial investment. However, by shifting community priorities and actively pursuing existing sources of financial assistance, Fort Pierre can continue to be an example of the best that South Dakota has to offer: a small-town feel with big-city amenities, and "History You Can Touch".

Recommendation 1: Expand the Multi-Use Bike Trail

The existing multifunctional bike path is a strong amenity for the community of Fort Pierre. This path creates many active transportation opportunities for residents and visitors alike. In order to better serve its users, additions to the path are required. These additions include more public connections to residential neighborhoods, city parks, and other locations along the scenic riverfront. These extensions will also include more public amenities such as stopping points where users can sit comfortably and take in the scenery these locations have to offer.

Additional Trailheads

Public connections are achievable in a variety of ways. These connection points include, but are not limited to:

- Public parks
- Fischer's Lilly Park
- The future Marina near the Missouri riverfront
- East 9th Avenue neighborhood
- Neighborhoods from Shimrose Drive to West Main Avenue¹
- Oahe Dam Visitor's Center and surrounding campgrounds



Figure 1: New Multi-Use Path Connection Points

Extended Routing

Extending the trail will promote excellent connection to key features that the Fort Pierre area has to offer. Extension of the path would allow for active transportation to the Oahe Dam area as well as riverfront area. If the path was extended along the riverfront, the nearby bluffs could also be utilized as an additional route option. By looping the path, users will experience greater ease of travel and more route options.

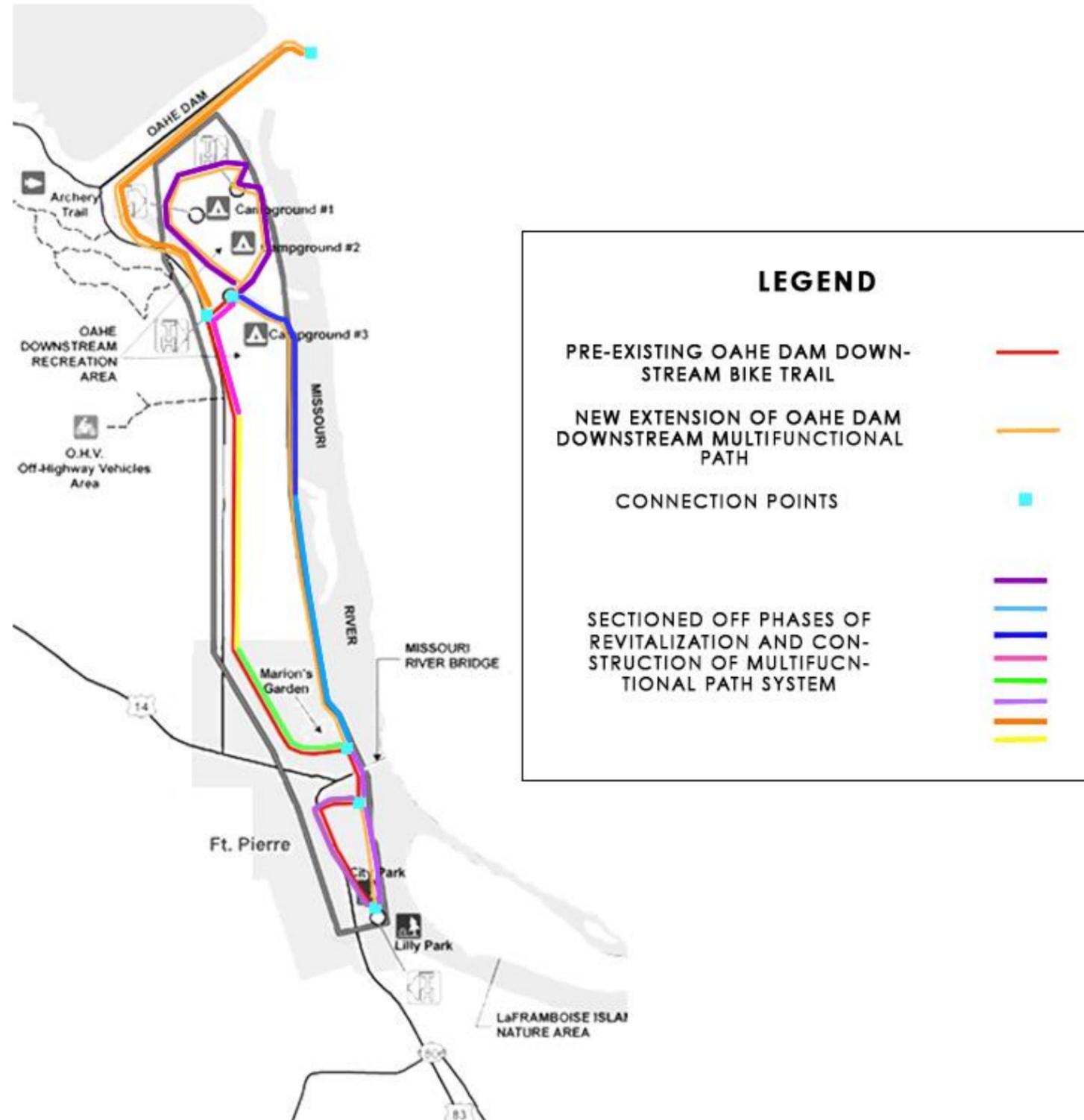


Figure 2: Proposed Multi-Use Path Enhancements

The current bike path suggests a natural connection to the riverfront. Because the city already owns the riverfront edge, this opportunity presents itself as a smooth and clear progression. The benefits of extending the bike path along the riverfront include scenic views for users, economic opportunities for businesses, and access points for residents living along the path addition.



Figure 3: Bike Path Extension along Riverfront

Path-Side Waypoints

Path-side waypoints also need to be developed. These amenities will create comfortable and desirable stopping locations along the entire length of the trail. Appropriate seating and resting areas will be equipped with water stations and shelter from the elements (sun, rain, etc.) Bike racks and picnic tables could also be provided to allow for multiple uses. Wayfinding aids will help orient users to these amenities as well as the opportunities the trail has to offer. Materials should match throughout the system to ensure quality and cohesion of amenities. Shelters, benches, tables, waste receptacles, and other amenities should be durable and styled to fit with the visual aesthetic Fort Pierre wishes to project.

Another source of visual harmony is the addition of plant material along the trail. Multiple varieties of zone hardy trees should be included to prevent die back or disease. A variety of trees and other plant material such as native grasses will provide users with visual interest while they enjoy the path system.

Amenities Cost Estimate

- Benches (40) - \$20,000 - \$35,000
- Trash Receptacles (15) - \$7,500 - \$10,000
- Bike Racks (15) - \$3,000 - \$5,000
- Drinking Fountains (5) - \$7,500 - \$10,000
- **Total Cost Estimate = \$38,000 - \$60,000ⁱⁱ**

All Amenities Cost Estimates are related to the prices found in ‘The Park and Facilities catalog’, and prices may vary depending on amenities selected and number of products according to the recommendation



Figure 4: Waypoint along SR-1804

These improvements to the already functioning bike path, will lead to more frequent use. Lengthening the trail opens opportunities for exploration of Fort Pierre and its surroundings. This will lead to a greater appreciate and enjoyment of the unique environmental context of the Capital Region, and better facilitate active lifestyles in the city.

Recommendation 2: Introduce Bike Lanes on Key Roads

The current conditions in Fort Pierre do not facilitate safety for pedestrians and cyclists. The perception of safety on streets and sidewalks is not as high as it can be in many parts of the city. Cyclists are forced to share the road with either vehicular traffic, or pedestrians. As a result, there becomes a conflict of interest between cyclists, traffic, and pedestrians. Each of these methods of transportation dedicated transportation infrastructure. At present, each of these three are forced to share same space in much of Fort Pierre. Cyclists, vehicular traffic, and pedestrians should not have to compete for space on roads and sidewalks.

In addition to further developing sidewalks for pedestrian use (see Recommendation 3), Fort Pierre should implement a bike lane specifically designed for cyclist traffic. Bike lanes are relatively inexpensive, with one mile of protected bike lane one-hundredth the cost of one mile of new roadwayⁱⁱⁱ. Bike lanes improve the flow of traffic and also provide safety that riding with vehicular traffic cannot. Not only does a bike lane offer a mode of active transportation, but also adds an economic boost to local businesses: cyclists are more prone to shopping because of their ability to stop more frequently^{iv}. Thus cyclists contribute to a more profitable economy, especially in a smaller city like Fort Pierre.

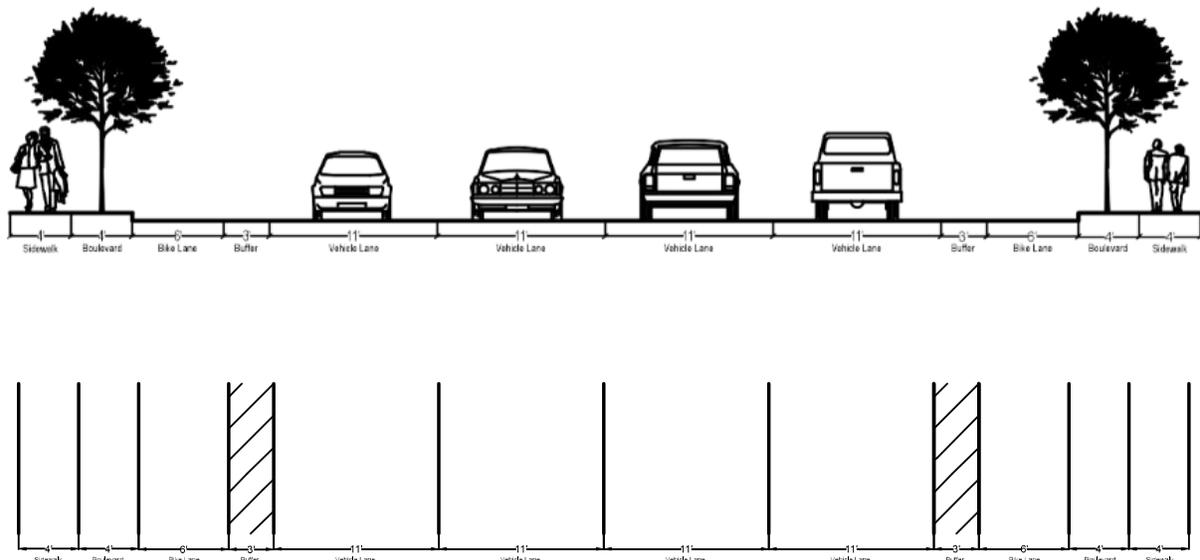


Figure 5: Proposed Bike Lane Integration

This solution also helps to eliminate existing conflicts and potential for accidents between cyclists, vehicular traffic, and pedestrians by giving each of these methods of transportation their own lane. Our methodology for developing this strategy has included the following steps:

- Identify roads that bear a large burden of heavy traffic
- Identify potential connection points with the existing multi-use trail
- Identify roads that lead to the Stanley County schools and other community amenities (ice rink, fairgrounds, parks system)
- Designate nine feet (six feet for the bike lane and three feet for a buffer) on these streets
- Prioritize streets that require the most attention and phase them out

It is recommended to roll out the bike lane in four phases.

Phase I includes the introduction of bike lanes on Hwy-14 and Hwy-83, due to their central role in managing traffic to and through the city. This phase will require cooperation and collaboration with the SDDOT.

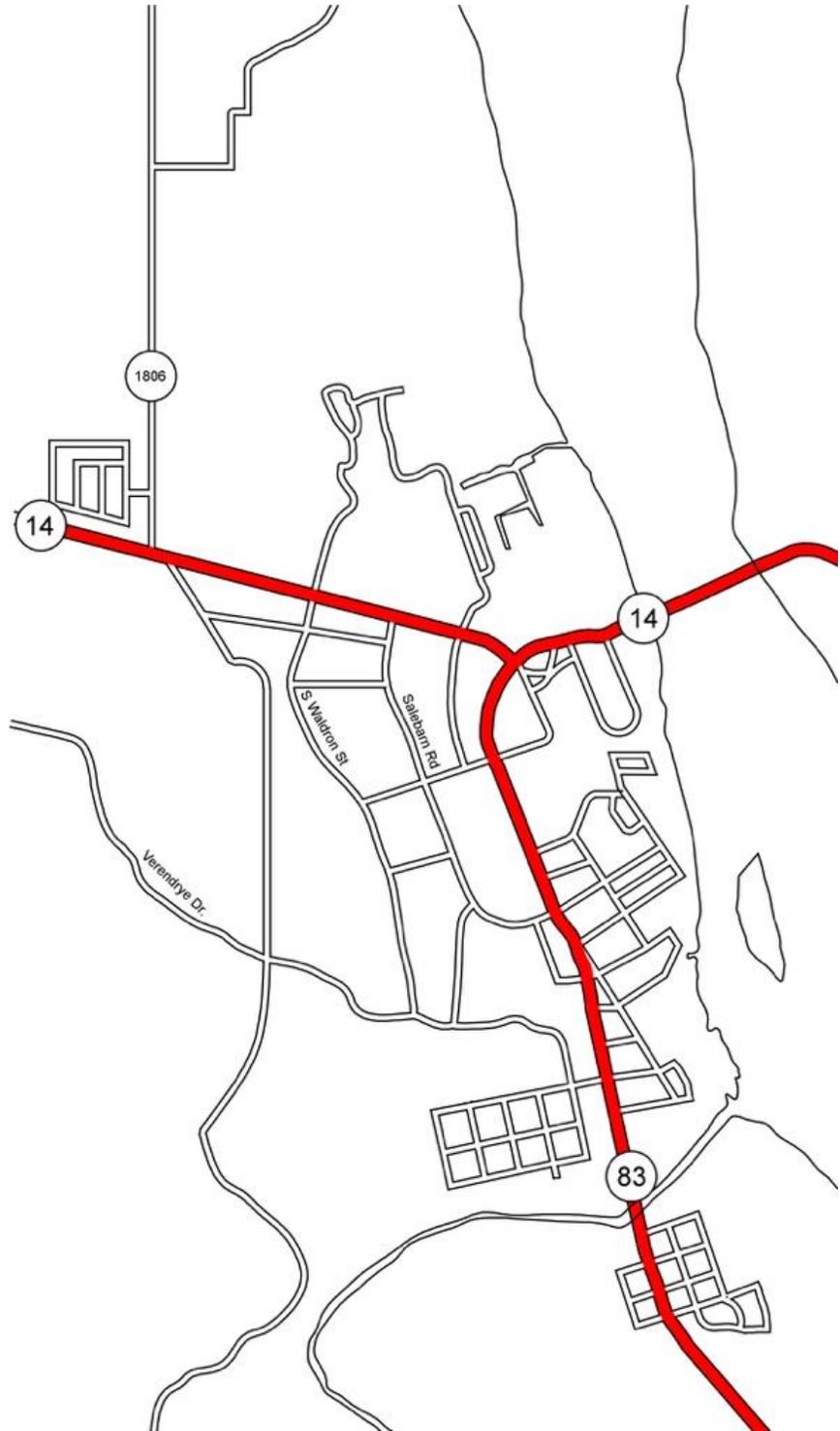


Figure 6: Bike Lane Phase I

Phase II provides greater access to the existing multi-use bike trail. Residents currently place a high priority on this existing trail, but lack easy access to it from the south side of Hwy-14, where many people live and work. This phase incorporates safe crossing points at the intersections of Hwy-14 with South Waldron and Skerrols Streets.

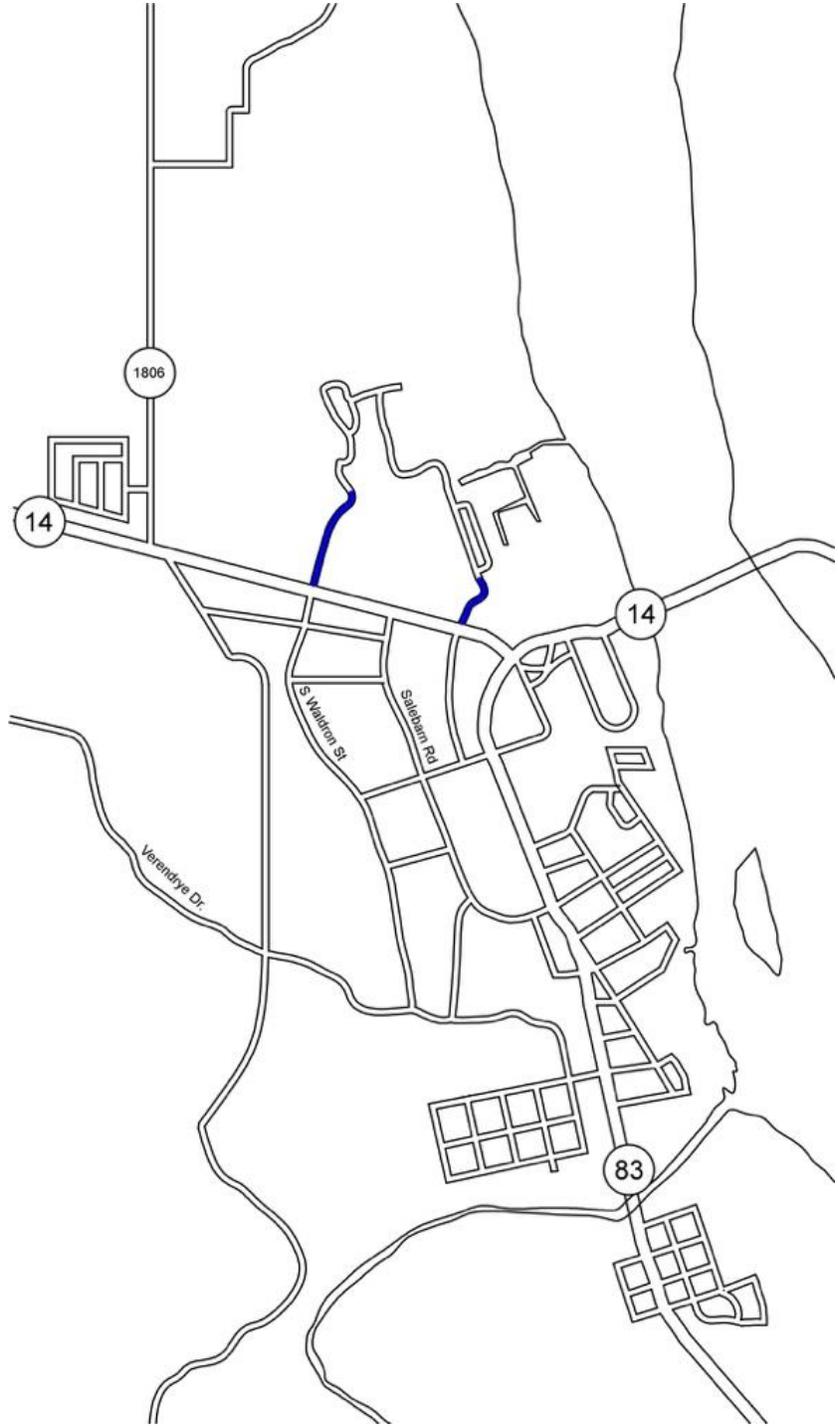


Figure 7: Bike Lane Phase II

Phase III connects students to the Stanley County school system across Hwy-83. This will provide a convenient and safe alternative for students and parents who currently drive to school, thereby easing traffic congestion at drop-off and pick-up times.

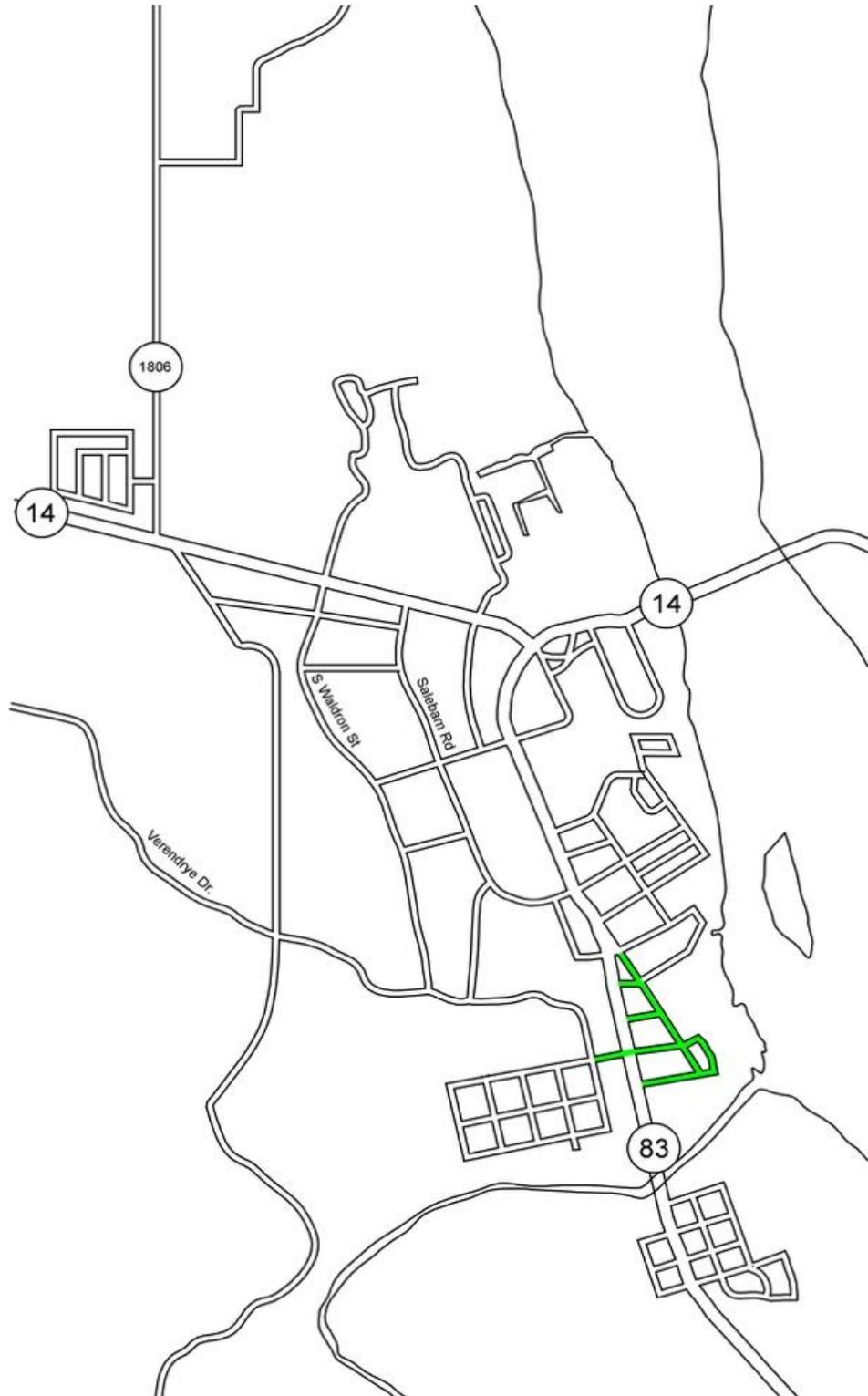


Figure 8: Bike Lane Phase III

Phase IV will further connect underserved residential neighborhoods in the south and west portion of town to the first three phases, including a crossing over Hwy-14 at SR-1806. This phase represents the transformation of Fort Pierre into a community that facilitates and encourages active modes of transportation throughout the city.

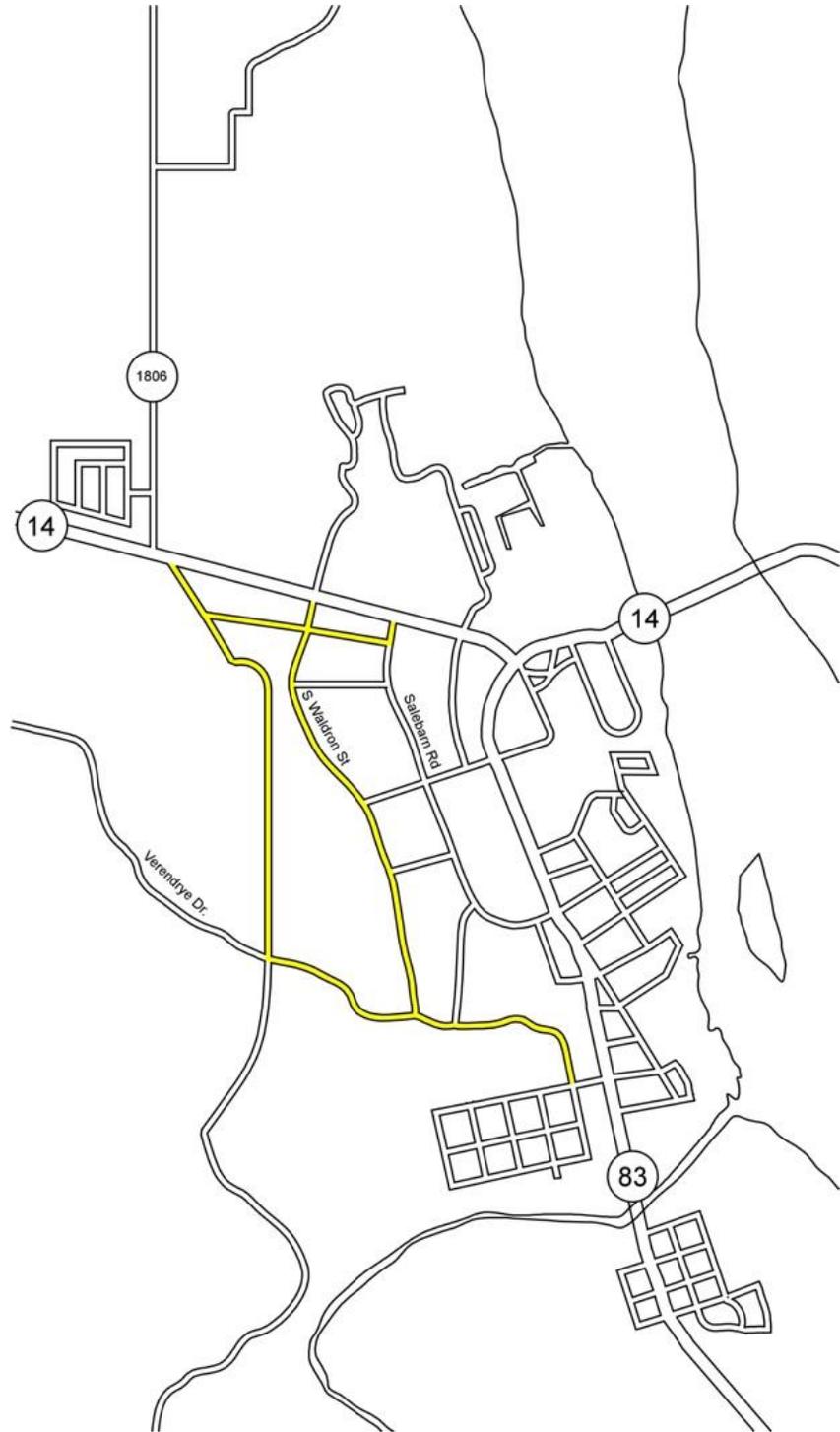


Figure 9: Bike Lane Phase IV

Recommendation 3: Adopt a Phased Sidewalk Implementation Plan

According to the National Association of City Transportation, sidewalks play a vital role in city life. As conduits for pedestrian movement and access, they enhance connectivity and promote walking. While visiting Fort Pierre, this was one of the major issues we uncovered^v. Fort Pierre lacked the connectivity necessary for a city to thrive and encourage an active community. Sidewalks are absent in most of the city which presents a safety issue for the community. The National Association of City Transportation goes further to state that safe, accessible, and well-maintained sidewalks are a fundamental and necessary investment for cities, and have been found to enhance general public health and maximize social capital. Just as roadway expansions and improvements have historically enhanced travel for motorists, superior sidewalk design can encourage walking by making it more attractive^{vi}. Not only can sidewalks enhance the opportunity for visitors to experience the beauty of Fort Pierre but it also provides them with the necessary safety when walking along busy roads and intersections.

Vehicular and pedestrian traffic should be segregated. It is unsafe for pedestrians and motorist to share the same pavement for travel. According to the National Highway Traffic Safety Administration there were 4,735 pedestrians killed and an estimated 66,000 injured in traffic crashes in the United States during the 2013 year^{vii}. As defined for this study, NHTSA describes a pedestrian as any person on foot, walking, running, jogging, hiking, sitting, or lying down who was involved in a motor vehicle traffic crash. This indicates that pedestrians are more vulnerable walking along streets than crossing them. The majority of the roads in Fort Pierre lack sidewalks and buffer zones segregating pedestrian travel from vehicular travel. Adding sidewalks along with proper buffer zones will give pedestrians the appropriate space necessary to react if a dangerous situation arose. These sidewalks will be most essential in public school and residential areas where majority of the pedestrian traffic occurs.

Briefly stated above, Fort Pierre lacks sidewalks on most streets. In addition, of the sidewalks present in Fort Pierre, very few are in good condition. Many of the present sidewalks are in conditions of which present safety hazards to individual's utilizing them, especially persons with disabilities. A pedestrian can easily trip and fall, seriously hurting themselves and possibly introducing more serious problems to the city with lawsuits. Large obstacles also obstruct visual access for individuals traveling down these sidewalks. Obstacles like trucks, signs, mailboxes and even trees can be found relatively close to the sidewalks which can present a safety hazard to pedestrians and motorists. The lack of visual perception can lead to an individual being seriously hurt by oncoming traffic.

Implement a Sidewalks Ordinance for New Construction

The first step in fixing a problem is recognizing there is one; Fort Pierre lacks sidewalks necessary for safe pedestrian travel and connectivity which needs to be fixed. Implementing a city ordinance requiring new construction (residential and commercial) to incorporate and construct sidewalks into the property layout is a crucial step in solving this problem. By proposing and executing this ordinance, issues of sidewalk connectivity will be avoided in newly developed areas. This will ensure the future layout of the city is centered on pedestrian safety and connectivity. Examples of proposed language for the ordinance can be found in Appendix A.

Once the city has established this standard and minimized the problem, the next step will be to address the issues that have already presented themselves. By implementing an annual plan to construct sidewalks in the already develop areas, the city can focus on specific regions helping to minimize the stress associated with construction in city limits. The figure below is a color coded road map based on sidewalk necessity. The roads highlighted in red are first priority, roads highlighted in yellow are second priority and roads highlighted in green are low priority where sidewalks already exist or are not immediately necessary.



Figure 10: Sidewalk Improvements Master Plan

The construction of sidewalks on the roads highlighted in red will provide pedestrians with a basic route that navigates throughout Fort Pierre. This path is a first priority because it is one that will be most utilized by pedestrians. The roads highlighted in red should be considered Phase I of the sidewalk construction process. Once Phase I is completed, Phase II should commence. Phase II deals with the construction of the second priority sidewalks, highlighted in yellow. Phase II provides larger coverage of the city by splitting from the main path labeled in Phase I. This path will provide pedestrians with a more personal and direct route to their homes. Phase III consists of the lowest priority roads; these roads are not heavily trafficked. The determination on whether sidewalks are important on these roads should be determined by city officials, with priority given to those routes which afford the greatest number of residents with safe, alternative routes from their homes to places of business, recreation, worship, learning, and commerce.

When determining where to begin sidewalk construction, it is necessary to look at which areas of the town are most influenced by pedestrian travel. The regions listed below are in order of importance. When Phase I begins, the School District Region would be the starting point of construction and the Stockyard region would be the ending point. The proposed region list is as follows:

School District Region

- Bad River north to E 7th Ave.
- N 1st St. east to Missouri River

The key streets to focus on in this region in Phase 1 are:

- Missouri Street between 7th and 5th Avenues
- 5th Avenue between Missouri and 1st Streets
- Deadwood Street between 4th and 3rd Avenues
- Deadwood Street between 2nd and Main Avenues
- Main Avenue between 1st Street and the river

Improvements on these streets will provide greater connectivity with existing sidewalk segments and help to ensure safe routes around the school properties and the after-school venues. In addition, it will complete the connection between the downtown and Fischers Lilly Park.



Figure 11: School District Region

Bad River Region

- Bad River south to Laframboise Dr.
- W Cedar Ave. east to Missouri River

Improvements in Fort Pierre south of the Bad River include:

- Ash Avenue between Casey Tibbs Street and Fischers Lilly Park Entrance
- Casey Tibbs Street between Ash and Scotty Philip Avenues
- Cedar Avenue between 1st and Casey Tibbs Streets
- Park/Cedar Avenue from Casey Tibbs Street to the west end of the road
- Scotty Philip Avenue from 1st Street to the east end of the road



Figure 12: Bad River Region

These connections provide greater access to Fischers Lilly Park, the ice arena, and the Stanley County Fairgrounds, further connecting residents in south Fort Pierre with the north part of town.

West Main Region

- Verendrye Dr. south to Bad River
- N 7th St. east to N 1st St.

Priorities here include:

- 1st Avenue from 2nd Street to the west end of the road
- 6th Street between 1st and 2nd Avenues
- 2nd Avenue from 3rd Street to the west end of the road
- 2nd Street between 2nd and Main Avenues
- Main Avenue between 1st and 2nd Streets
- Main Avenue between 5th and 6th Streets



Figure 13: West Main Region

These streets connect this residential neighborhood with schools to the east and provide greater safety and connectivity within the neighborhood itself.

Commercial Region

- US-14 E south to E 7th Ave.
- N Deadwood St. east to Missouri River

Important connections in this region include:

- Marion Street between Hwy-14 and 7th Avenue
- Deadwood Street (Hwy-14/83) between Marion Street and 7th Avenue
- 9th Avenue between Deadwood and Marion Streets
- Missouri Street between 9th and 7th Avenues

This proposal addresses access within the mixed commercial/residential district and Downtown to the immediate south, thereby expanding pedestrian access from Highway 14 and the entrance to the city all the way to the heart of the city at the Bad River.



Figure 14: Commercial Region

Golf Course Region

- Fort Chouteau Rd. south to US Highway 14
- State Highway 1806 east to Missouri River

Key improvements here include:

- Hwy-14 from Deadwood Street to SR-1806
- Skerrol Street from Hwy-14 to Islay Avenue
- Charlotte Avenue from Jamison Drive to Skerrol Street
- Islay Avenue
- Iona Street
- Jura Avenue
- SR-1806 between Hwy-14 and Fort Chouteau Road
- Rousseau Road between SR-1806 and Hamilton Court
- Fort Chouteau Road between SR-1806 and the entrance to the monument

These improvements help to augment the recreation and active transportation activities afforded by the multi-use bike trail, and encourage alternative means of enjoying the golf course, monument, and other amenities north of town.



Figure 15: Golf Course Region

Stockyard Region

- US Highway 14 south to Verendrye Dr.
- County Rd. east to N Deadwood St.

The focus in this region is on:

- Salebarn Road between Hwy-14 and Deadwood Street
- Stanley Road between Salebarn Road and Deadwood Street

These improvements allow customers at the Fort Pierre sale barn to easily access hotels and eating establishments on foot across Deadwood Street, thus encouraging active transportation amongst all sectors of Fort Pierre's residents and visitors.

Implementation of this plan will demonstrate that Fort Pierre is truly concerned with pedestrian and vehicular safety, and committed to the principles of active transportation. It will foster the close-knit sense of community that Fort Pierre has long enjoyed, and encourage others to continue to invest in the city.



Figure 16: Stockyard Region

Recommendation 4: Salebarn Road Improvements

It is evident that the smells and noise that comes from the local sale barn are a reoccurring problem for some residents of Fort Pierre. On the other hand, it is the heart of Fort Pierre and a big part of the city's business and history. It is ideal to find a way to mitigate these complications rather than setting them aside. Salebarn Road as a whole lacks unity. This street has no appealing visual factors. The road is mainly taken up by open gravel parking lots and the sale barn itself.

There is a lack of enclosure when traveling the street, as there is very little vegetation along the street. This results in cars going faster and thus creating an unsafe walk for pedestrians. There are a couple of different ways to attack these issues. One recommendation is to create a hotline for the people of Fort Pierre to call and explain their concerns with the Salebarn Road, whether they be smells, noises, traffic, etc. In addition, new fencing should be introduced into the area, which would greatly reduce the noise levels coming from the sale barn. To further address sound mitigation, trees should be planted along the fence. This will also add an aesthetic value to the area, help calm traffic, and absorb much of the airborne particulate matter originating from the livestock pens. Finally, redirecting Salebarn-specific heavy traffic will help to ease congestion and conflicts with other vehicular traffic in the area.

Create a Hotline for Complaints

The smells that come from the sale barn will never completely cease to exist. However, a hotline has been proven to help, as it did for a town in Colorado^{viii}. Greeley, Colorado has a meat packing plant that gives off unpleasant odors and tends to be noisy. This has been a problem for the city since the 1980s. To help Greeley's citizenry feel involved and heard, a hotline for complaints was installed. Citizens tired of the smells or other issues associated with the plant could call in and lodge a complaint. If three or more complaints of the same nature were made in the same day, a specialist was dispatched to the plant. They would decipher what was causing the issue and see if the odor could be lessened. The system has proven effective over time: 600 phone calls were received in 1995—the first year it opened—but in 2012 only 25 were logged.

This is a cost-effective and simple tool for letting people air their complaints. All that is needed is a phone line and someone to answer calls and dispatch a trouble-shooter. This recommendation will help Fort Pierre's citizens and visitors that their opinions matter and are heard. It will also demonstrate whether there truly is a negative perception of the Salebarn Road area in town.

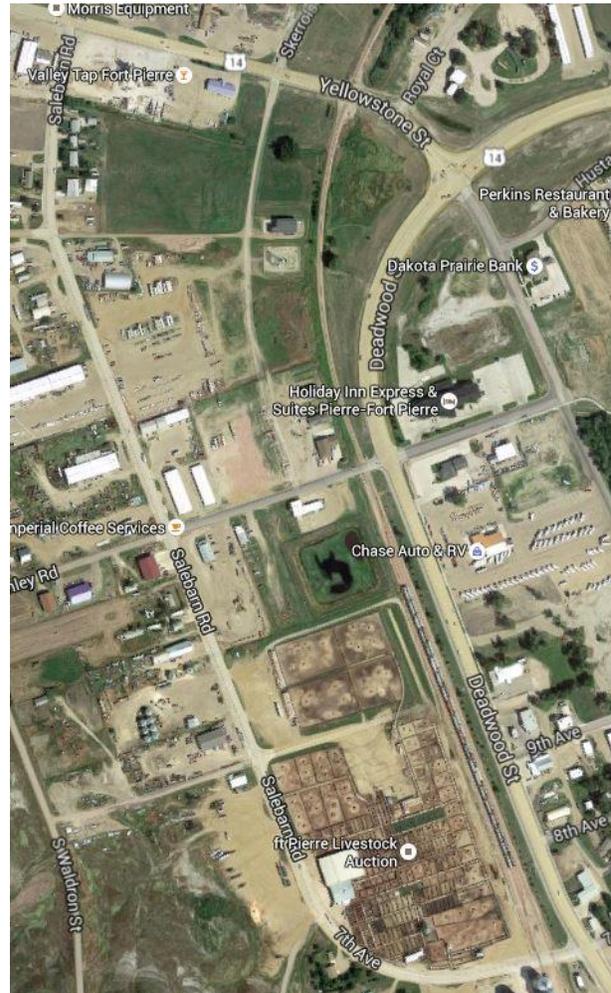


Figure 17: Salebarn Road and Vicinity

Install Fence and Vegetation

Fencing should be installed directly around the sale barn itself. Many different types of fencing can be chosen. Among the various styles of fencing, the one shown in Figure 18 would absorb sound while allowing passersby on the perimeter of the area views to the interior. It is important to maintain this connection, as the sale barn is a key component to the city of Fort Pierre. The fence could potentially have art or murals of the history of the city, especially as relates to the cattle industry. This would be an interesting way to tell the story of Fort Pierre graphically and be a unique amenity for the city (Figure 19).



Figure 18: Proposed Fencing Around Sale Barn



Figure 19: Example of Interpretive Mural Art

In addition to the new fencing, trees and other vegetation should be planted. Currently, the majority of the property on Salebarn Road is dominated by open pavement and gravel parking. Trees will not only help soften up this area but will help with the noise, dust and smells coming from the sale barn. Since there is a tree ordinance already in effect for Fort Pierre, efforts for enforcement should focus more on this area in the short-term.



Figure 20: Salebarn Road Pedestrian Improvements (before and after)

Redirect Semi Traffic

Lastly, traffic circulation should be addressed. Existing truck traffic clogs Hwy-83, the main north-south arterial in the city, on the way to the cattle yards. This traffic causes noise and air pollution and discourages pedestrians and cyclists on this road. If a new route or road was introduced as to where the semis could travel, it would significantly make Hwy-83 and Salebarn Road less dangerous for pedestrians and the small businesses located there.

We propose limiting truck access to the sale barn to South Waldron Street and the south entrance off of Deadwood Street. There is minimal traffic and few businesses on South Waldron Street compared to Salebarn Road, making it the more appropriate route for the semi traffic. To put this into effect it would require some new signage showing the new route to take, along with some road maintenance on South Waldron Street.

Conclusion

Salebarn Road is a historic landmark to the city of Fort Pierre and is very important to its culture. Currently the sale barn area is lacking unity, usability and aesthetics. If these recommendations were put into effect, Salebarn Road would become an amenity for Fort Pierre. The hotline would let the community get involved and potentially help generate new ideas. Incorporating new vegetation, fencing and redirecting traffic would not only make the area safer for pedestrians, but also mitigate the sounds and smells coming from the sale barn.

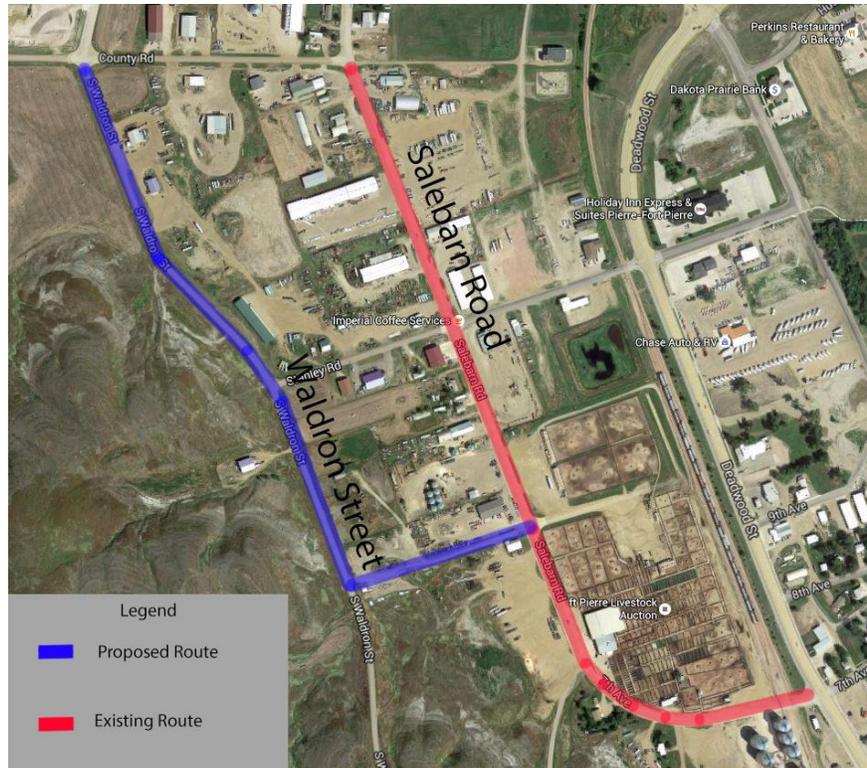


Figure 21: Proposed Heavy-Traffic Rerouting

Recommendation 5: Parks System Enhancements

Fort Pierre, with roughly 2,120 residents, has numerous recreational facilities that include community parks, a school park complex, sports fields, a golf course, and national historic landmarks. Parks and recreational areas have an impact on a community's health. Having these places gives people the opportunity for more physical, emotional, and social interaction within the community. A study conducted in Victoria, Australia, came to the conclusion that "improving the features of a local neighborhood park may lead to increased usage and physical activity^{ix}. Not only is the quantity of recreational areas important, but also the quality and distribution of the amenities within city limits. An analysis of the destination areas in Fort Pierre and the walkability to each destination will clarify where further recreational development may be needed to facilitate more active transportation within the community.



Figure 22: Existing and Planned Parks

A. Boat Access Area	
Location	4th & 5th Avenue along Missouri River
Acres	Approx. 2
Points of Interest	Location on riverfront
Amenities	Boat docks



Figure 23: Boat Launch Panorama and Satellite View

B. Casey Tibbs Memorial	
Location	Along 1st Street, beginning of 3rd Ave.
Acres	3
Points of Interest	Casey Tibbs Statue
Amenities	Rotating statue Bathrooms



Figure 24: Casey Tibbs Memorial

C. Centennial Park	
Location	Corner of West Main Ave. & 1st St.
Acres	Less than 0.5
Points of Interest	Small, open lawn
Amenities	Location to downtown



Figure 25: Centennial Park

D. City Park	
Location	27 1/2 E Main Street
Acres	Less than 0.5
Points of Interest	Near school & downtown; Bad River access to Missouri River
Amenities	Jungle gym
	City pool
	Boat access/docks
	Boat station
	Park shelter



Figure 26: City Park

E. Fischers Lilly Park	
Location	Ash Avenue
Acres	7
Points of Interest	Location on riverfront; Year-round interest; Near school & downtown
Amenities	Jungle gym
	Swings
	Park shelter
	Campground
	Bathroom
	Boating access/docks



Figure 27: Fischers Lilly Park

F. Future Marion's Acres Park	
Location	Marion's Acres
Acres	0.75
Points of Interest	New equipment
Amenities	Playground
	Basketball court
	Park shelter



Figure 28: Proposed Site for Marion's Acres Park

G. School Park Complex	
Location	112 S 1st Street
Acres	13
Points of Interest	Large recreational place
Amenities	Playground
	Football field
	Baseball/softball fields
	Track



Figure 29: High School Football Field

H. Ft. Pierre Chouteau	
Location	On Fort Chouteau Road
Acres	13
Points of Interest	Long and narrow; historical landmark
Amenities	Tourist attraction
	Signage /plaques



Figure 30: Fort Chouteau Memorial

I. Verendrye Memorial	
Location	4th Street
Acres	1
Points of Interest	Overlooking Ft. Pierre, Missouri River, & Pierre; historical landmark
Amenities	Tourist attraction Signage/plaques



Figure 31: Verendrye Historical Monument

J. Dunes Golf Complex	
Location	111 Fort Chouteau Road
Acres	59
Points of Interest	18-hole municipal facility family business
Amenities	Club & cart rentals
	Clubhouse with memberships
	Tee times



Figure 32: Dunes Golf Complex

K. Stanley County Fairgrounds & Expo Center	
Location	310 Casey Tibbs Street
Acres	27
Points of Interest	Location on riverfront
Amenities	Rodeo
	Auctions
	Concerts
	Circus

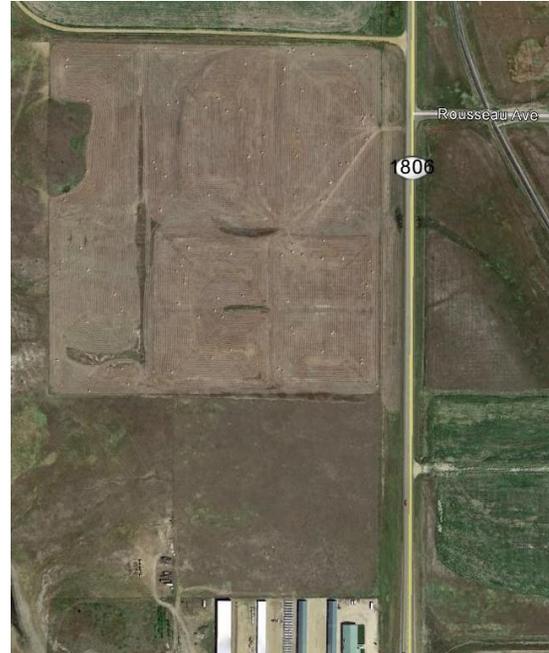


Figure 33: Stanley County Fairgrounds

L. Future Ball Park	
Location	On Scenic Byway Hwy 1806 near Rousseau Avenue
Acres	4
Points of Interest	New large recreational place
Amenities	Softball fields



Figure 34: Site of Future Softball Complex



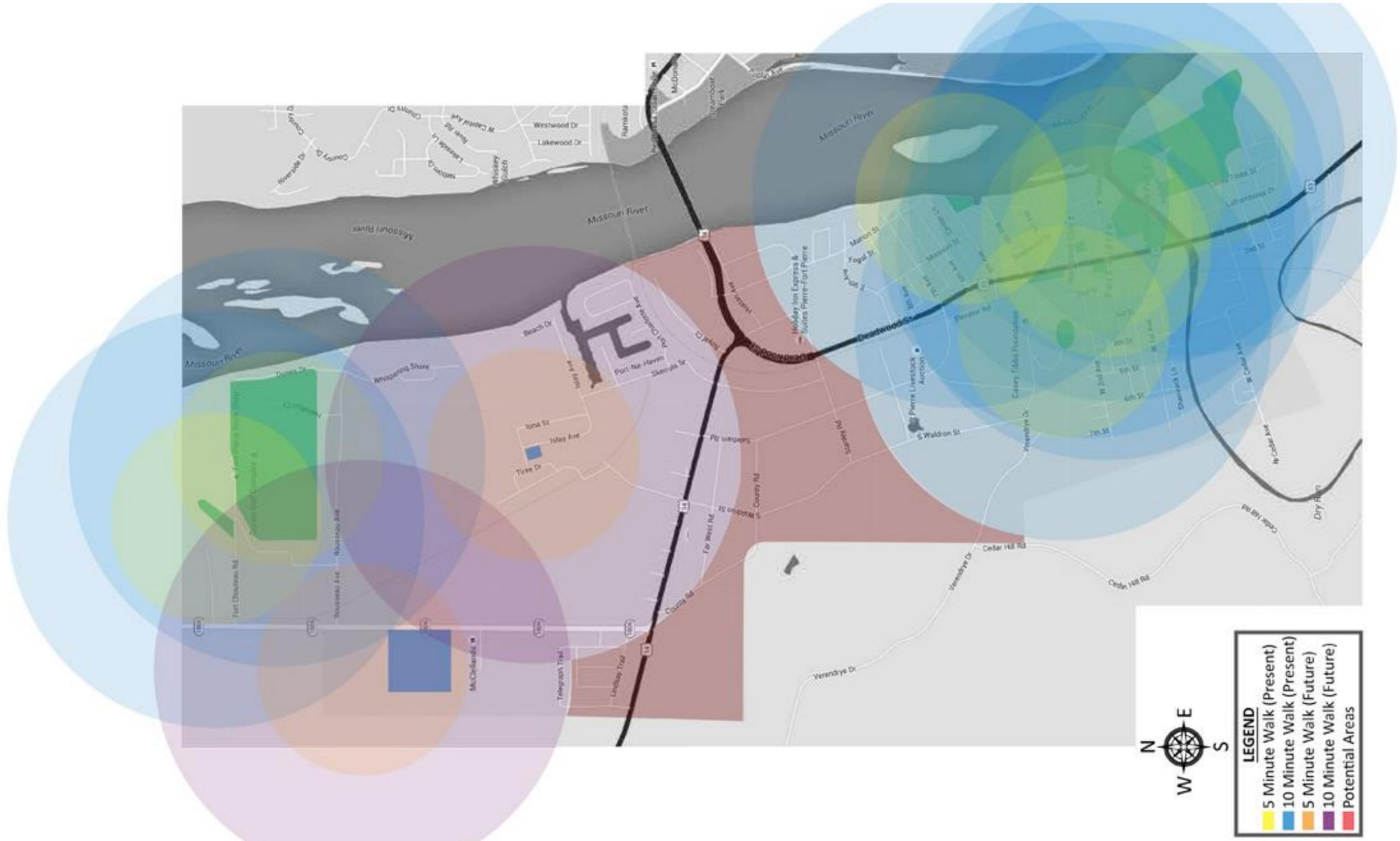


Figure 35: Parks System Service Area

Evaluation of Fort Pierre Parks System Distribution

The city of Fort Pierre offers, as of now, ten destinations for citizens to enjoy within city limits. As seen in [Figure 1 Map], most destinations are slightly clustered in the downtown district while two others are near the north edge of the city limits. Future park development is happening in the north side of city limits in Marion's Acres and along Highway 1806. In Figure 35 (previous), the walkability to each recreational area is mapped. The inner circles (orange for future and yellow for present) of the larger circles signify five minutes of walking to the nearest entrance of a recreational area as the larger circles (purple for future and blue for present) represent a ten-minute walk. Due to the clustering of recreational areas in the downtown district, a couple of parks and destinations are covered with multiple walking zones giving people opportunities to go to more than one area. Although these destinations are appropriate, Fort Pierre has a few areas that lack proper coverage (shown in red).

Though most of the red area is industrial or commercial property, nearly three-fourths of one neighborhood is out of walking distance. The western most neighborhood on Highway 14 and Highway 1806 is in need of some recreational area. With the development of a future ball park starting with two ball diamonds along Highway 1806, a playground should be included along with a trail system from that recreational area to the underserved neighborhood. This will promote active transportation and physical activity by requiring residents to travel a shorter distance to a recreational area.

Enhancements within Fort Pierre Parks System

Each recreational area has its own uniqueness due to its history, location, and/or function(s). Though some areas are of better quality than others, improvements should be addressed.

Overall Parks System

Plants other than trees and lawn -- such as shrubs, herbaceous perennials, and bulbs -- play an important role in the outdoor environment. No recreational area besides Centennial Park has any of the above mentioned plant material. Having such plants in recreational areas can create a sense of wonder and enjoyment. Maintenance is low if appropriate species are selected. This should happen in consultation with qualified experts.

School Park Complex

While visiting and analyzing the school park complex at the end of January 2016, water was being pumped out of the school playground near the concrete drainage channel. This drainage issue should immediately be taken into account and be properly fixed with additional soil and appropriate grass seed or mulch. Not doing so right away will cause unnecessary clean-ups in the school and/or children's homes.



Figure 36: Drainage Issues at Playground

Casey Tibbs Memorial

Located on Highway 83 going to or from the downtown district, this recreational area should be updated. It is suggested that, in order to create a more aesthetically pleasing experience, the recycling dumpster be relocated from where it currently sits. In place of the one, large dumpster, one smaller one should be located

in the Stanley County Fairgrounds and one in the industrial/commercial properties along Highway 14. Evergreen shrubs (juniper species) should be placed in a row by the memorial fence leading to the bathroom area and north edge of the site. This would create walk spaces in front of the shrubs and also from the fence to the shrubs. Pathways should be made with 1/2" aggregate bound by plastic edging. This will facilitate drainage and will be easy to maintain. A master plan and perspective photo have been made to show the recommendation (Figure 37).



Figure 37: Existing Condition at Casey Tibbs (left) and Proposed Improvements (right)

Recommendation 6: Adopt CPTED Program in Parks

There tends to be a problem with vandalism within the parks of Fort Pierre, making them risky places to be. A risky park will drive away the citizens who tend to contribute to the appropriate use of public space, and invites further vandalism and crime to occur [I]. The city parks should become a safe place to interact and be active. The hot spots in each park, where the most vandalism takes place, should be the main focus of solving the problem.

The acts of vandalism need to be stopped in the Fort Pierre parks. The city should view these parks as beautification and aesthetically pleasing areas. A solution to this problem is through the adoption of Crime Prevention Through Environmental Design (CPTED) tactics. CPTED is defined as a multi-disciplinary approach to deterring criminal behavior through environmental design^x. The goal of CPTED is to stop the offender before the act of crime is committed through the idea that they are being watched. CPTED encompasses three strategies: natural surveillance, natural access control, and natural territorial reinforcement.

Natural surveillance can be achieved by generating the opportunity for more active transportation routes (walking & biking) around park areas. Landscape designs should impact the point of entry into the park to make for a strong viewing window. When considering the placement of light fixtures, a strong design will avoid blind spots. Where there are places that lack surveillance, closed-circuit television (CCTV) can be implemented. CCTV relies on strategic placement of cameras and observation of the camera's input on monitors elsewhere^{xi}.

Natural access control can be achieved through a strong design that will lead park users through the desired paths. Proper access points should be easily defined. Fences can be used to eliminate intrusion into private places. Thorny plants can be planted at the base to further reinforce that there will not be any trespassing.

Natural territorial reinforcement can relate to residential areas as well as public park safety. Maintaining landscapes and parks will show that the space is actively being taken advantage of and being used for its actual purpose. Residential areas with trees are seen as safer and more attractive. Amenities such as seating will give a sense of attraction for desired users.

There needs to be priorities in place for this process to be successful. An increase in the Parks Department staff is necessary. As the city keeps increasing in size, there are proposals for new park establishments. New park proposals lead towards the need of a larger staff to help monitor and keep the city parks in pleasing condition. Fort Pierre should have one more full-time employee and one more part-time employee. A secondary, but not as desirable, option is to utilize volunteers to provide adequate surveillance in the parks. The long-term outlooks should be considered and these opportunities seen through the lens of successful parks and green spaces, where upkeep, safety, and social interactions for the citizens of Fort Pierre are paramount. This is best facilitated with a larger, trained parks staff.

Limit After-Hours Vehicular Access to Verendrye Monument

The Verendrye Monument marks a location where Louis Verendrye and his brother buried a lead plate claiming the land for France^{xiii}. The monument is on Verendrye Mountain which overlooks the city of Fort Pierre and the Missouri River. This isolated facility is the frequent target of vandalism and littering. These acts of crime are most likely committed after hours. To help prevent this, eliminate vehicular access with a gate across the access road from sunrise to sunset. The gate could be placed in one of two different locations. Incorporating the vehicular access gate would be in the best interest to reduce the acts of crime committed at the monument site. Patrolling this facility after-hours is also necessary.

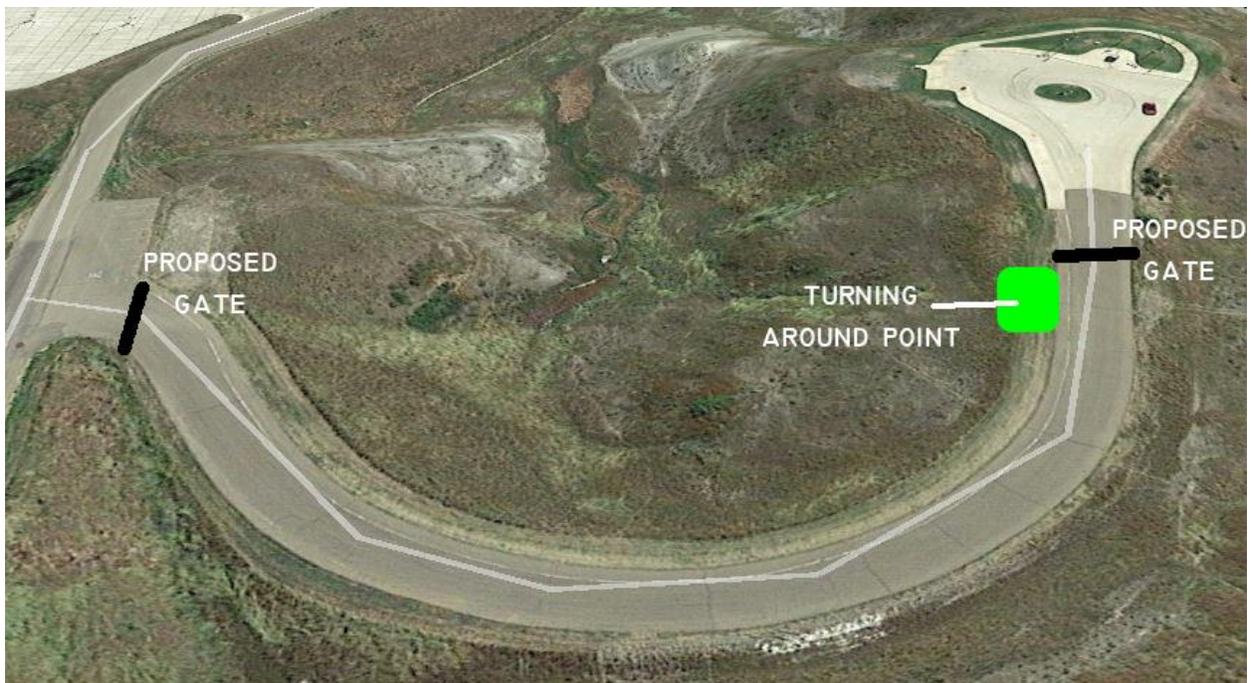


Figure 38: Proposed Controlled-Access Measures at Verendrye Memorial

Increase Surveillance at Fischers Lilly Park

Fischers Lilly Park is the location where Lewis & Clark came in contact with the Teton Lakota nation tribe and almost put a stop to their expedition. The park is in an attractive location at the confluence of the Bad River and the Missouri River. The issues in this park also deal with littering and vandalism. The picnic shelters are where most of this takes place. Surveillance cameras (CCTV) should be placed inside the picnic shelters to identify and prosecute those committing these acts. Cameras are intimidating to people and help to hold them accountable for their actions, making people think twice about their choices. The incorporation of more light fixtures throughout the park will ensure safety and lead people through the park. Lights eliminate blind spots that are inviting for littering and vandalism to take place.



Figure 39: Proposed CPTED Measures at Fischers Lilly Picnic Shelter



Figure 40: Fischers Lilly Park Lighting Improvements

The Casey Tibbs Monument features a life-sized sculpture that swivels in the wind like a weather vane. This replication is of Tibbs' championship ride on the horse Necktie^{xiii}. The wooden fences protecting the sculpture have been vandalized, as has the chain-link fence separating the park from the adjacent train tracks. There are overhead lights in the area, but the addition of uplighting on the sculpture will ensure a more protected area as a whole. The landscape lighting will also accent the statue, making it more visible and striking in the evening hours.

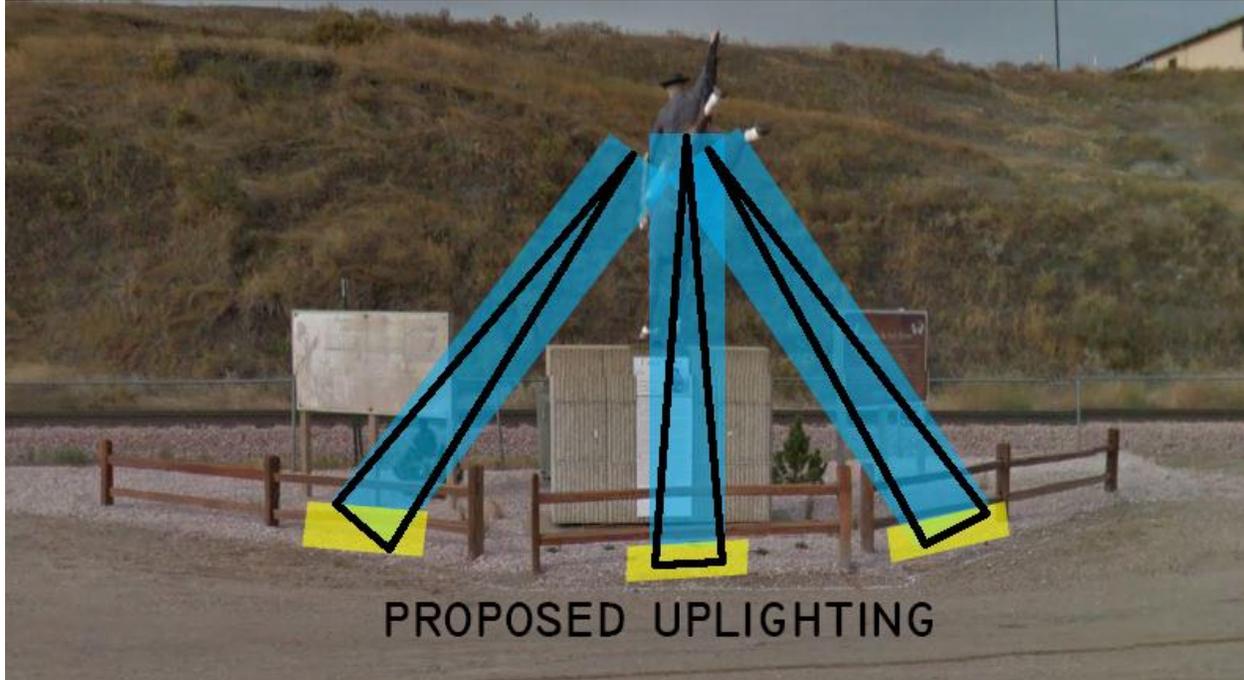


Figure 41: Placement and Effects of Accent Lighting on Tibbs Memorial Statue

In addition, the incorporation of crime-detering plant materials such as junipers or barberries between the chain-link fence and the parking area, as suggested in the Recommendation 5, will help to discourage unwanted access and vandalism.

There are many opportunities for preventing vandalism in Fort Pierre's parks and public spaces. By adopting CPTED principles and practices, the City will improve wanted access to these facilities and help to promote a sense of stewardship and responsibility amongst all age and social groups in the community. This will in turn lead to a greater level of active transportation as people feel safe to travel to and visit park areas.

Recommendation 7: Improve Signage in Fort Pierre

Fort Pierre is located along the Missouri River, mirroring its sister city of Pierre. With this prime location, combined with an ever-expanding supply of parks and public amenities, Fort Pierre naturally attracts many visitors from around the state. One issue that continues to arise amongst visitors is the lack of a well-coordinated wayfinding system in the city. Visitors consistently complain that getting around Fort Pierre is counter-intuitive, and that many attractions in the city are difficult to find. This recommendation seeks to address this problem, and has been developed in coordination with a citizen-led committee studying the issue for the city.

Directional Wayfinding

Wayfinding refers to visual and textual information systems that guide people through a physical environment and enhance their understanding and experience of the space^{xivxv}.

Throughout the City of Fort Pierre there are historical monuments, parks, boat docks, bike/walking paths, etc. However, there are very few wayfinding signs to help people navigate throughout the city to these different locations. Because of this, it is recommended that a comprehensive directional wayfinding plan is installed.

Directional wayfinding will benefit the city in many ways. With Fort Pierre having so many monuments and highlights throughout the city, it is important that visitors are able to locate and utilize these amenities. By adding wayfinding throughout the streets of Fort Pierre, visitors and residents will be able to navigate throughout the city to different sites without confusion.

Cautionary Signage

These signs are used to warn road users of the potential for certain hazardous conditions either on or adjacent to the roadway, so that the motorists are cautious and take the desired action.

A number of outdoor activities currently take place in Fort Pierre, including walking, running, cycling, and water sports. However, there are very few cautionary signs throughout the city that adequately warn people about the safety concerns of their surroundings. It is recommended that a cautionary signage system be installed throughout the city as appropriate.

Cautionary wayfinding aids will be placed along bike paths, streets, school zones, pedestrian crossings, etc. This will warn people of things that they should be looking out for, including cyclists sharing the roadway, pedestrian crossings, and school zones. These signs will aid in the safety of residents and visitors throughout the city.

Proposed Signage Design

Signs will direct pedestrians and vehicular traffic to main entrances, key decision points, destinations, and exit points. They will also warn pedestrians and drivers of obstacles in the area (cyclists, pedestrian crossing, school zone, etc.) by displaying graphic prompts. These signs shall harmonize with the surrounding architecture and historic charm of the city. The signs need to be clear, easily recognizable, and easy to understand; making for easy and safe navigation throughout the entire city.



Figure 42: Example of Cautionary Signage

The major roadways (HWY 14 & 83) will include large double-pole panels (see Figure 43). These signs will be used to direct pedestrians towards the main attractions throughout town. On the secondary roads, small single-pole signage will be used to direct pedestrians to many other destinations throughout the city (Figure 44). These signs will be designed to allow for future expansion; the pre-existing posts will have the ability to add or remove a panel, this will allow for a continually up to date and efficient wayfinding system.

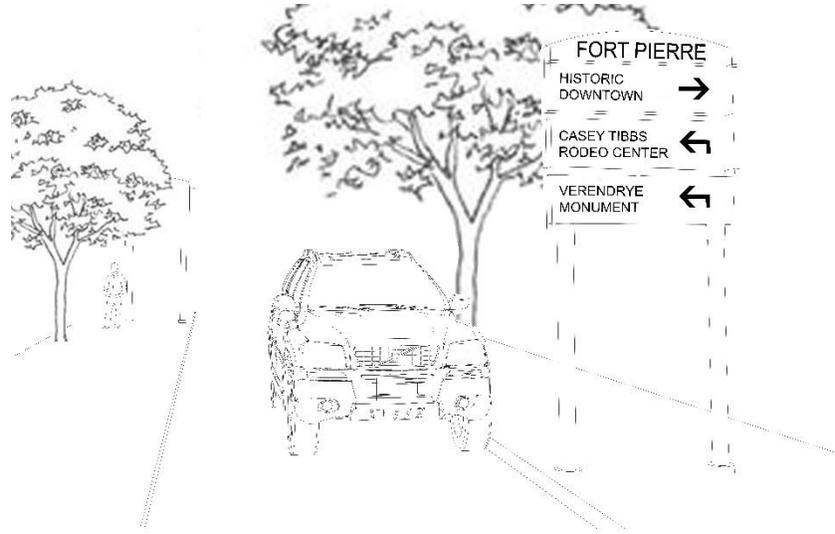


Figure 43: Double-Pole Wayfinding Panel

Benefits

There are multiple benefits that can come from a successful wayfinding system. Navigations will become much easier for those who are unfamiliar with the Fort Pierre area. This will help reduce frustration, stress, anxiety, and late arrivals, increase the safety throughout the city for both vehicular and pedestrian traffic, and it will enhance the aesthetic value of the city. Not only will this system benefit the visitors of Fort Pierre, but it will also benefit the local economic development as visitors are informed of the existence and location of various businesses and attractions.

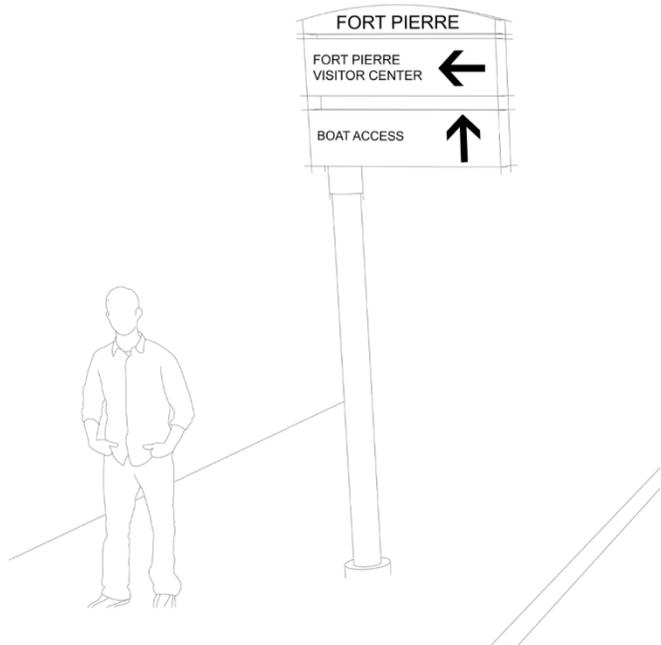


Figure 44: Single-Pole Wayfinding Panel

Phasing Plan

Each wayfinding sign, including the design and installation an estimated cost is approximately \$3,000. Along Highway 14 and Highway 83 there will be eight double-pole signs and along the secondary street there will be eight small-pole signs, this will bring the initial estimated cost to approximately \$48,000. Each sign will have the option to add on additional panels; this estimated to cost between \$500-\$1,000 depending on the size of panel (single-pole or double-pole).

There are multiple ways to phase-in this plan gradually. It is recommended that the large signs along Highway 14 and Highway 83 are installed first, and that the small, single-pole signs on the secondary roads are installed on a priority, as-needed basis after that. Potential funding sources for this wayfinding system include grants, donations, and a sponsorship program for businesses that would like to have their name displayed on a sign.

Proposed Destinations

The following list of sites in Fort Pierre includes the key locations to which visitors will most likely require in-situ directions (Figure 45). Other sites may be added in the future as the need presents itself. There is also a need to relate to Fort Pierre's sister city Pierre, the Cultural Heritage Center, and the State Capitol Grounds within this wayfinding system.

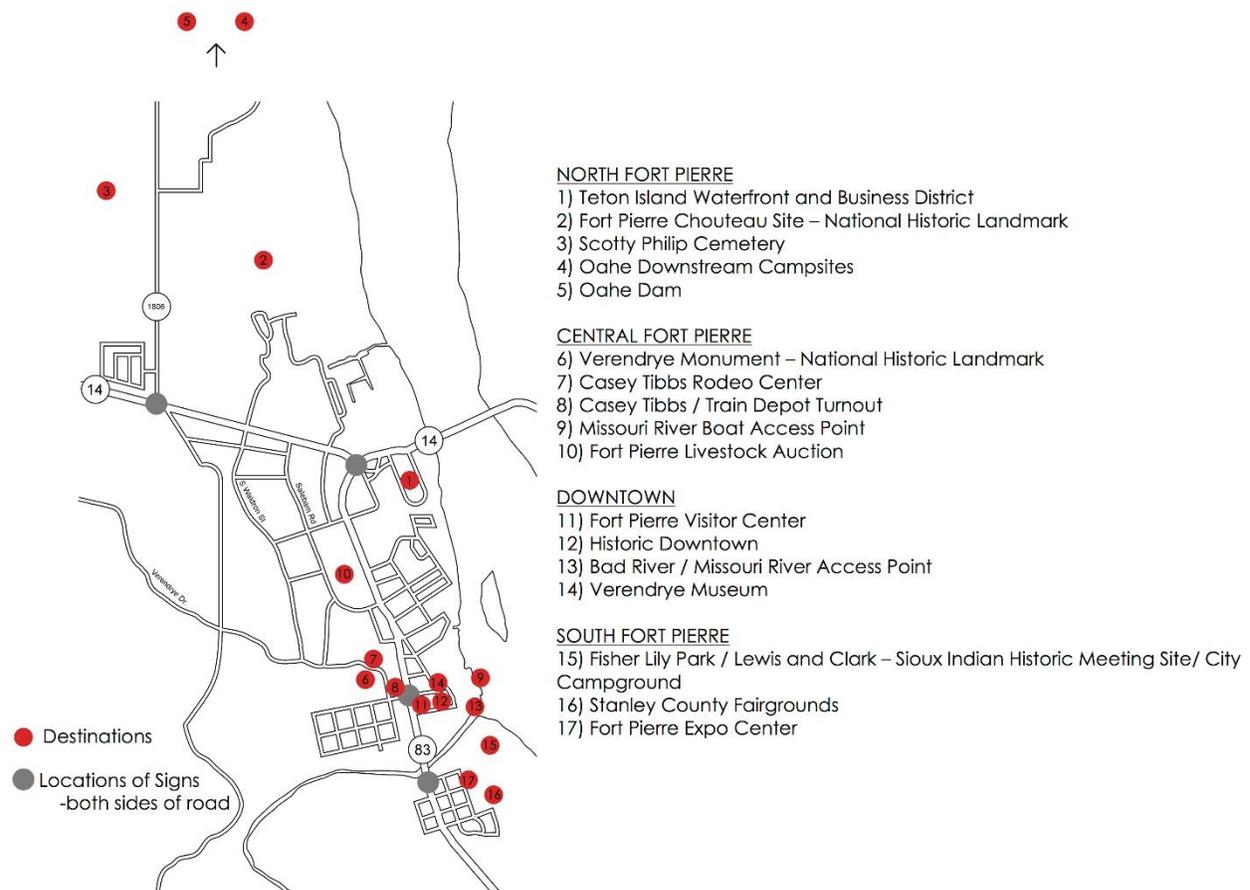


Figure 45: Proposed Wayfinding Locations

Appendix A: Sample Sidewalk Ordinance Language

Rapid City, South Dakota^{xvi}

12.08.060 New and existing developments.

A. *Conformance with sidewalk requirements—Exceptions.* The construction of a permanent sidewalk fronting or abutting all streets, highways and avenues shall be accomplished by the builder, owner or developer of all new or existing residential or commercial buildings within the city, except in the following circumstances:

1. When the Common Council, pursuant to Chapter 17.50 of this code, approves a planned unit development or planned residential development incorporating a sidewalk plan unique to the development;

2. When the lot has a frontage in excess of 200 feet per dwelling unit located on the lot and is in the General Agricultural Zoning District; however, if the lot abuts or is adjacent to a lot with existing sidewalk, this exception shall not apply;

3. When the property has frontage along an interstate highway, a sidewalk will not be required along the interstate;

4. When the Common Council, in its sole discretion, approves a variance from sidewalk requirements.

5. All property with existing development on the effective date of these regulations which is not in compliance with the provisions of these regulations shall be considered nonconforming and allowed to continue until such time as a building permit is granted to enlarge by 20% or more a structure or parking lot on the property or increase the occupant load by 20% or more. A waiver of right to protest shall be required prior to a building permit being granted to enlarge by less than 20% a structure or parking lot on the property or increase the occupant load by less than 20%. Nothing in this section shall limit the City Council's ability to order the installation of sidewalk in accordance with the provision of § 12.08.020.

B. *Inspection prerequisite to certificate of occupancy—Bond.* No certificate of occupancy shall be issued nor shall a water meter be released until a final inspection by the Building Official reveals that security in an amount equal to the estimated cost of construction of the sidewalk, whereby the sidewalk will be constructed without cost to the city in the event of default by the builder, owner or developer of the property. All bonds and other methods of guarantee shall be approved by the City Attorney.

C. *Application for variance.* Any person aggrieved by any decision of the Building Official under this section may apply in writing to the Common Council for an exception from the requirements of this section.

96.050 RESPONSIBILITY.

The construction of a permanent sidewalk fronting or abutting all streets, highways and avenues shall be accomplished by the builder, owner or developer of all new or relocated residential and commercial buildings within the city.

(1992 Code, § 38-39) (Ord. 104-99, passed 10-14-1999)

96.051 SUPERVISION.

The building and construction of all sidewalks and driveway approaches within the city shall be done under the supervision of the city engineer.

(1992 Code, § 38-40) (Ord. 104-99, passed 10-14-1999)

96.052 APPROVAL GENERALLY.

The construction of sidewalks and driveway approaches within the city shall be approved by the city prior to the issuance of a certificate of occupancy as provided by the building code; except where conditions exist which in the opinion of the city engineer justify waiver thereof.

(1992 Code, § 38-41) (Ord. 104-99, passed 10-14-1999)

96.053 SPECIFICATIONS.

The construction of all sidewalks and driveway approaches, whether to be done by direct contract with the city or by contract with the abutting property owners, shall be done strictly in accordance with the city's specifications for sidewalks and driveway approaches. The city engineer shall have full power to condemn work and material not in accordance with the requirements of those specifications.

(1992 Code, § 38-42) (Ord. 104-99, passed 10-14-1999)

96.054 PERMIT REQUIRED.

(a) Before any sidewalk or private driveway approach is constructed within the right-of-way by any contractor or person for the owners of abutting property, the contractor or person must first secure a permit therefor from the city engineer.

(b) Any person installing or constructing a sidewalk within the right-of-way and in front of or along property owned by him or her shall obtain a permit. The sidewalk shall be constructed in accordance with city specifications. If the city determines that the sidewalk was not constructed in accordance with city specifications, it shall be replaced by the property

owner. The persons shall be exempt from the provisions of §§ 96.030, 96.031, 96.071 through 96.073, 96.085 and 96.086. Driveway approach permits will only be granted to bonded and insured contractors.

(1992 Code, § 38-43) (Ord. 104-99, passed 10-14-1999)

96.055 WIDTH OF SIDEWALKS.

The width of all sidewalks shall be determined by the city's engineering design standards.

(1992 Code, § 38-45) (Ord. 104-99, passed 10-14-1999)

96.056 SIDEWALKS IN PLANNED UNIT DEVELOPMENTS.

In approved planned unit developments including large scale residential developments as defined in chapter 160 of this Code, permanent sidewalks shall be located in a manner and in those areas as shall best provide access to the residents thereof, including utilization of open spaces and substantially as shown on approved development plans therefor, all subject to §§ 96.051 through 96.054.

Sources

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ⁱⁱ <https://www.theparkcatalog.com>

ⁱⁱⁱ Andersen, Michael. "NO, PROTECTED BIKE LANES ARE PROBABLY NOT TOO EXPENSIVE FOR YOUR CITY TO BUILD (CHART)." 5 Mar. 2014. Web.

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^v <http://nacto.org/publication/urban-street-design-guide/street-design-elements/sidewalks/>

^{vi} *ibid*

^{vii} <http://www-nrd.nhtsa.dot.gov/Pubs/812124.pdf>

^{viii} Heffel, Nathan. "Cow Town Opts For Funk Over Funky Smell." NPR. NPR, n.d. Web. 19 Apr. 2016.

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^{xii} City of Fort Pierre. "Verendrye Monument (2016)." <http://www.fortpierre.com>. Web. 6 Apr. 2016. <<http://www.fortpierre.com/attractions/verendrye-monument/>>.

^{xiii} Forrider, Nathan. "Rodeo Champion Rides with the Wind (2002)." <http://www.roadsideamerica.com>. Web. 6 Apr. 2016. <<http://www.roadsideamerica.com/tip/6910>>.

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^{xv} "SEGD." Clive Roux. Web. 19 Apr. 2016. <<https://segd.org/what-wayfinding>>.

^{xvi} "City of Rapid City, South Dakota Code Of Ordinances." American Legal Publishing. American Legal Publishing, 17 Feb 2015. Web. 14 March 2015.

^{xvii} "City of Sioux Falls, South Dakota Code of Ordinances." American Legal Publishing. American Legal Publishing, 10 Feb 2015. Web. 14 March 2015.