SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT AND SECTION 4(F) EVALUATION

FOR

I-29 Exit 130 (20th Street South) Interchange
EM 0295(45) 130, PCN 020V
And 20th St S and 22nd Ave S Intersection
EM 0295(45) 130, PCN 0A3L

Brookings County
Brookings, South Dakota

Submitted Pursuant to 42 U.S.C. 4332(2) and 49 U.S.C. 303
by the
US Department of Transportation
Federal Highway Administration
and
South Dakota Department of Transportation

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ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act
APE	Area of Potential Effect
BMP	Best Management Practice
BUILD	Better Utilizing Investments to Leverage Development
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EA	Environmental Assessment
EO	Executive Order
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
I-29	Interstate 29
IPaC	Information for Planning and Consultation
ITC	Interstate Telecommunications Coop
LOS	level of service
LWCF	Land and Water Conservation Fund
NEPA	National Environmental Protection Act
NLEB	Northern Long-Eared Bat
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OHWM	Ordinary High-Water Mark
OWUS	Other Waters of the United States
ROW	Right-Of-Way
SDDANR	South Dakota Department of Agriculture and Natural Resources
SDDOT	South Dakota Department of Transportation
SDGFP	South Dakota Department of Game, Fish, and Parks
SEA	Supplemental Environmental Assessment
SHPO	State Historic Preservation Office
US 14	U.S. Highway 14
USACE	U.S. Army Corps of Engineers
U.S.C.	U.S. Supreme Court
USDOT	United States Department of Transportation
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

In 2020, an Environmental Assessment (EA) and, in 2021, a Finding of No Significant Impact (FONSI) were signed by the Federal Highway Administration (FHWA) and South Dakota Department of Transportation (SDDOT) to construct the Interstate 29 (I-29) at 20th Street South Interchange. This Supplemental Environmental Assessment (SEA) is to evaluate the expansion of the east-side corners of the 20th Street South and 22nd Avenue South intersection to improve the turning radius for trucks and the right-of-way (ROW) preservation for future widening on the west side of 22nd Avenue South (the Project). The Project is in the City of Brookings (Brookings) in Brookings County, South Dakota.

The east side corners expansion project is identified in the current South Dakota Statewide Transportation Improvement Program (STIP) (2025-2028) as PCN0A3L. The stakeholders for this Project include Brookings, Brookings County, SDDOT, and FHWA. The Project has been coordinated with state and federal agencies, landowners, businesses, and Brookings's Parks, Recreation and Forestry Department.

There is no specific project noted in the Brookings City Improvement Plan (CIP) for the ROW preservation along the west side of 22nd Avenue South. The development plans that were known during the 2020 EA have progressed and coordination between the Brookings and developers has continued. ROW preservation is needed for the future improvements on the west side of the intersection to avoid conflict with the development of these areas. ROW preservation is being completed through match funding from Brookings. Brookings is doing this through their development plan review and approval process.

This SEA was developed in accordance with the National Environmental Policy Act (NEPA) and the Council on Environmental Quality's (CEQ's) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] §1500-1508) and the corresponding regulations and guidelines of the U.S. Department of Transportation (USDOT) and FHWA.

1.1 NEED FOR SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

In 2020, the construction of the I-29 Interchange at 20th Street South did include the intersection of 20th Street South and 22nd Avenue South, which is directly adjacent to the Edgebrook Golf Course. Edgebrook Golf Course is a property protected under Section 6(f) of the Land and Water Conservation Act. The design and construction at the intersection avoided the need for permanent right-of-way (ROW) from the Edgebrook Golf Course which would have resulted in permanent conversion or the acquired ROW under Section 6(f). A permanent conversion process can take at least a year to coordinate.

The I-29 interchange at 20th Street South had received a FHWA Better Utilizing Investments to Leverage Development (BUILD) grant which had a tight timeline. If the timeline for obligation of funds had not met, the overall project funding would have been lost. Therefore, the Preferred Alternative of the 2021 FONSI avoided ROW impacts to the Edgebrook Golf Course by constructing tight corners at the 20th Street South and 22nd Avenue South intersection. The construction of the interchange and 20th Street South from 22nd Avenue South to 34th Avenue South was completed in 2023. Large trucks have experienced significant difficulty turning at 20th Street South and 22nd Avenue South intersection corners without infringing on adjacent and

opposing direction traffic lanes. The traffic signals at the corners have also been damaged by turning trucks. In addition, the 20th Street South and 22nd Avenue South intersection provides primary truck access to the new interchange.

At the conclusion of the construction of the I-29 interchange at 20th Street South, a portion of the original grant funding was still available. When issues that resulted from the original project were identified, SDDOT, Brookings, and FHWA re-examined this intersection identifying additional improvements that could be made to better meet the Project's Purpose and Needs. FHWA determined that the remaining grant funding could be utilized for the expansion of the intersection corners and extended the grant expiration date to allow for that construction.

The SEA focuses on the proposed improvements considered at 20th Street South and 22nd Avenue South intersection. Proposed improvements include:

- Expand the northeast and southeast corners of the 20th Street South and 22nd Avenue South intersection to allow for large trucks to turn without infringing on adjacent and opposing direction traffic lanes.
- Construct new crossing points for the Allyn Frerichs Trail along the east side of 22nd Avenue South since the intersection corners would be revised. In general, the trail would remain in its existing location, but the grade would be raised to meet Americans with Disabilities (ADA) guidelines. Refer to Figure 2-2.
- Traffic signals on the east side of 22nd Avenue South installed with the 2022/2023 construction project would be moved for the expanded intersection corners.
- The Interstate Telecommunications Coop (ITC) building in the northeast quadrant of the 20th Street South and 22nd Avenue South intersection would be removed and replaced by the utility company to allow for the intersection widening (Figure 3-7).

In addition, ROW preservation on the west side of 20th Street South and 22nd Avenue South is included in this SEA. As noted in the 2020 EA, the existing southbound 22nd Avenue South through lane would become a right-turn lane at 20th Street South. A southbound through lane would be added between Canasta Lane and 20th Street South just to accommodate the two southbound through lanes at the 20th Street South and 22nd Avenue South intersection. An eastbound right-turn lane would be added to 20th Street South on the west side of 22nd Avenue South. Refer to Figure 2-2.

The future improvements were noted in the Interchange Justification Report (IJR) and confirmed within the latest traffic report (Appendix A). The ROW preservation is included within the SEA due to the development that has occurred in the southeast quadrant of the intersection and the planned development on the northeast quadrant of the intersection. Both developments were noted in the 2020 EA and have progressed, therefore ROW preservation is needed. Refer to Sections 3.2 and 3.3 for further discussion of the development within this area.

Within the 2020 EA, improvements were also noted for 34th Avenue Southeast and 20th Street South intersection by 2045. Development has not progressed in this area and the updated traffic study (Appendix A) does not show an increase in traffic that requires improvements at the intersection; therefore, ROW preservation is not warranted at this intersection.

1.2 STUDY AREA AND PROJECT AREA

For the 2020 EA, a Project Area and EA Study Area were defined early in the NEPA process and were used to consider the current transportation system and future transportation needs that may be impacted by the construction of the I-29 Interchange at 20th Street South. For the definition of each area and application within the EA process, please refer to the 2020 EA. A Study Area for the 2020 EA was also defined, refer to Figure 1-1. The 2020 EA Study Area focused on the area where the build alternatives may impact.

For this SEA, a more focused area for the proposed improvements to the 20th Street South and 22nd Avenue South intersection, a Study Area was defined. The Study Area was defined early in the process and defined the area the alternatives may impact. Refer to Figure 1-1 for the Study Area.

Figure 1-1. Project Location, Study Area, and 2020 EA Study Area

1.3 UPDATES TO REGULATIONS SINCE FONSI

The following discusses the changes that have occurred since the 2021 FONSI:

- In 2020, the Council on Environmental Quality (CEQ) issued a final rule to update its regulations for Federal agencies to implement the National Environmental Policy Act (NEPA). The rule is intended to improve interagency coordination in the environmental review process, promote earlier public involvement, increase transparency, and enhance the participation of States, Tribes, and localities.

- In 2022, the CEQ issued this final rule to amend certain provisions of its regulations for implementing the NEPA, addressing the purpose and need of a proposed action, agency NEPA procedures for implementing CEQ's NEPA regulations, and the definition of "effects."

- In 2024, the CEQ was finalizing its "Bipartisan Permitting Reform Implementation Rule" to revise its regulations for implementing the procedural provisions of the NEPA, including the recent amendments to NEPA in the Fiscal Responsibility Act. CEQ is making these revisions to provide for an effective environmental review process; ensure full and fair public engagement; enhance efficiency and regulatory certainty; and promote sound Federal agency decision making that is grounded in science, including consideration of relevant environmental, climate change, and environmental justice effects.

- In 2025, The Council on Environmental Quality (CEQ) issued this interim final rule to remove the existing implementing regulations for the National Environmental Policy Act of 1969, 42 USC 4321 et seq., as amended (NEPA), in response to Executive Order (E.O.) 14154, Unleashing American Energy. Among other things, EO 14154 rescinds EO 11991, Relating to Protection and Enhancement of Environmental Quality, which amended EO 11514, Protection and Enhancement of Environmental Quality, and directed CEQ to promulgate regulations for implementing NEPA and required Federal agencies to comply with those regulations.

- In 2023, the Supreme Court ruled that Clean Water Act protections apply only to wetlands and waters with a "continuous surface connection" to traditional interstate navigable waters, narrowing the scope of federal jurisdiction.

- The following updates to the Endangered Species Act (ESA) are being evaluated with this SEA:

    - The western regal fritillary (*Argynnis idalia occidentalis*) is proposed for listing as threatened species by the USFWS under the ESA and its range overlaps with the Study Area's location.

    - The Topeka shiner (*Notropis topeka*) is listed as an endangered species by the USFWS under the ESA and within the 2021 FONSI was not noted by the U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC). Its range has been updated and IPaC does not list the species within the Study Area.

    - The USFWS has proposed ESA protection for the monarch butterfly (*Danaus plexippus*). The proposal is to list the species as threatened with species-specific protections to conserve it under Section 4(d) of the ESA.

- The northern long-eared bat (NLEB) (*Myotis septentrionalis*) was uplisted to endangered status under the ESA on March 31, 2023. Final tools and guidance documents to conserve the NLEB were released on October 23, 2024.

- The poweshiek skipperling (*Oarisma poweshiek*) is an endangered species under the ESA, however, the range for this species has been updated and the species is no longer listed for the Study Area's location. Analysis of this species is not included in this SEA.

1.4 PURPOSE AND NEED FOR THE PROJECT

The purpose for the Project was identified within the 2020 EA and focused on the transportation needs of system linkage and traffic capacity. The purpose and need statement were developed with consideration of public input as well as agency and tribal input. Initial coordination with agencies and tribes occurred through scoping letters. In addition, meetings were held with each potentially affected landowner. Coordination with agencies, tribes, landowners, and the public will continue throughout the Project.

The purpose and need of the project have not changed. A more concise purpose and need are restated in Sections 1.2.1 and 1.2.2, for the full discussion please refer to the 2020 EA[1].

1.4.1 Purpose of the Project

The purpose of the Project for this SEA is unchanged from the 2020 EA and 2021 FONSI. The purpose of the Project is to relieve congestion on major north-south and east-west arterials and to improve transportation connectivity for community access and to facilitate growth of the local economy.

1.4.2 Project Needs

The needs for the Project for this SEA remain unchanged from the 2020 EA. Each is listed below with a discussion of relevancy to the 20th Street South and 22nd Avenue South intersection.

- **System Linkage**- The limited connections across I-29 in the existing roadway system cause longer commuting and travel times, which are expected to increase as future development of the southwest portion of Brookings occurs. For this intersection, the current design of the intersection is causing issues for trucks to turn and utilize both roadways, 20th Street South and 22nd Avenue South, as system links within the overall Brookings transportation system.

- **Traffic Capacity**- Forecasts were developed during the 2020 EA for traffic growth and were updated for this SEA in January 2025 (Appendix A). At the intersections of 22nd Avenue South and 20th Street South, traffic would become congested by planning year 2045. As noted in the 2020 EA, this intersection was improved from a level F to a C for AM and PM peak hour with the construction of the interchange. The improvement of the turning radius and ROW preservation proposed in this SEA would continue to allow the 2045 LOS to be maintained for this intersection.

[1] SDDOT, 2020. Environmental Assessment and Section 4(f) Evaluation for I-29 Exit 130 (20th Street South) Interchange located at Interstate 29 20th Street South Interchange

One Revised Build Alternative is considered for this SEA. The No Build Alternative is included to satisfy the NEPA requirements and FHWA guidelines and provides a baseline for evaluating impacts. Both are discussed further in Chapter 2.

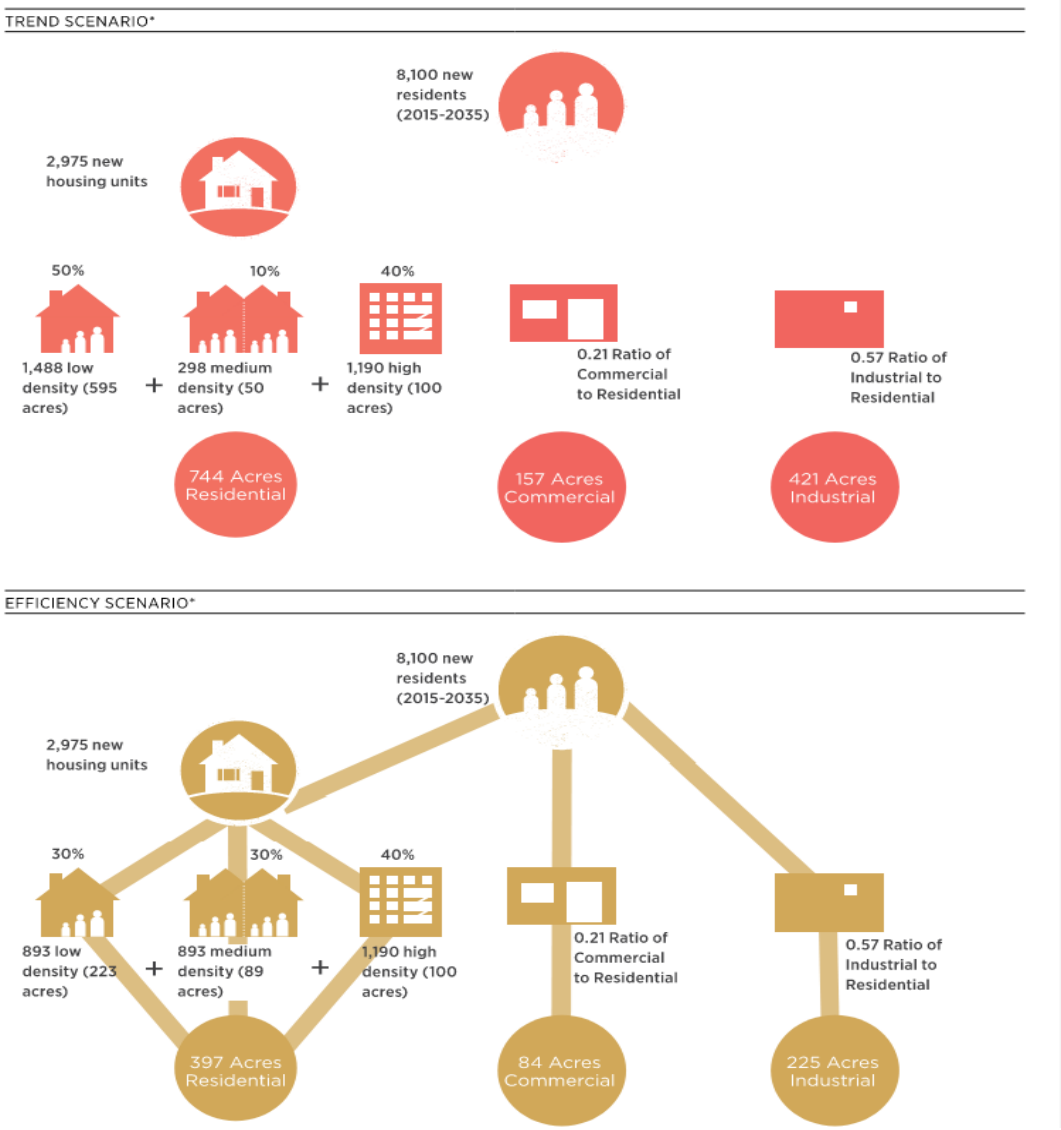
1.4.3 Project Goals

The Project goals remain unchanged from the 2020 EA. Through the scoping process, goals were considered for this Project. While Project goals are not used for screening alternatives, these goals are incorporated into the alternatives, where possible, to meet the concerns of the public and agencies. The goals identified during the public and agency scoping processes, economic development, safety, and multi-modal opportunities- the following discusses each.

1.4.3.1 Economic Development

This Project would contribute to future growth patterns, land development, and new business development. This is shown by the recent development of the southeast quadrant of the 20th Street South and 22nd Avenue South intersection as a Starbucks, and the northeast quadrant as a proposed gas station. The current growth rate of Brookings was reviewed, as were the development (residential, commercial, and industrial areas) needed to continue this growth rate and the ability of the Project to facilitate that development for Brookings to meet its growth rate.

Brookings is the fourth largest community in South Dakota, with a steady growth rate of 2.5 percent per year in population. In 2018, Brookings completed an updated *Brookings South Dakota Comprehensive Plan 2040* (*2040 Comprehensive Plan*) that included an in-depth evaluation of population and economic growth trends, land use trends and patterns, and transportation systems. To meet the continued steady growth rate, land use growth would need to occur through development of vacant land. The amount of land required to meet the growth rate was presented in two scenarios, trend and efficiency, in the *2040 Comprehensive Plan*. The trend scenario assumed that Brookings would grow at the same density and patterns that it has in the past, including many single-family detached homes. The efficiency scenario assumed that development will happen in a more compact manner, including a greater variety of housing options on smaller lots, reflecting the national trend in smaller scale retail (City of Brookings 2018). Graphic 1-1 shows the breakdown of acres of land that would be needed for residential, commercial, and industrial uses to meet the current growth rate under the trend and efficiency scenarios.



Graphic 1-1. Land Use Scenarios in the 2040 Comprehensive Plan (City of Brookings 2018)

The *2040 Comprehensive Plan* addressed the future development that will be needed to allow Brookings to continue to grow. The following was noted regarding the economy of Brookings that was relevant to the proposed interchange at 20th Street South (City of Brookings 2018):

- Limited street connectivity to large areas of undeveloped land.
- Prioritization of transportation connectivity to assist in meeting Brookings' growth rates.

In addition to the *2040 Comprehensive Plan*, the following documentation noted the plans to meet the growth areas needed:

- In 2011, Brookings and Brookings County commissioned the *Brookings Area Master Transportation Plan.* Completed in 2013, this study concluded that a new 20th Street South interchange would allow for additional access to the industrial park, allowing for additional

development of the park and the planned development on the east side of I-29 to occur (HDR 2011).

- In 2016, the *Comprehensive Land Use Plan for Brookings County* was completed. This plan noted community growth and the need for future development to accommodate that growth. This plan also noted that the reason planned development areas have not moved forward is because of the lack of existing transportation system infrastructure (Brookings County Planning Commission 2016).

- The BUILD grant application identified previously planned development areas near 20th Street South. These areas would help meet the needed residential, commercial, and industrial opportunities for this growing community.

For the 2020 EA process, Brookings and the Brookings Economic Development Corporation provided the current planned development areas within the Project Area. For this SEA the development was reassessed and within the Study Area includes a recently developed northwest quadrant and current development plans for the southeast and southwest quadrants of the intersection that are moving forward. Each of these developments contributes to this overall economic goal for the Project.

Table 1-1 shows the area needed for residential, commercial, and industrial growth for the entire city, not just the Study Area. The current planned areas in the Study Area are also noted to show the progress toward the Brookings's needed growth area due to the Project and to show that clearly defined development areas are identified. As the planning studies indicated, by creating better connectivity in the roadway system, planned development would proceed. The completed and planned areas in the Study Area are compared to the acreage needed for residential, commercial, and industrial growth for the entire city to demonstrate that this Project would assist Brookings in facilitating economic growth and striving to meet its growth rate.

Table 1-1. Acreage of Residential, Commercial, and Industrial Areas Needed to Maintain Brookings' Current Growth Rate in Comparison to Planned Development Areas

Land Use	Acreage Needed (Trend Scenario)	Acreage Needed (Efficiency Scenario)	Acreage of Development Plans Overlapping with the Study Area (Estimated)
Residential	744	397	4.5
Commercial	157	84	12.5
Industrial	421	225	0

1.4.3.2 Safety

The previous studies analyzed crash records in the Project Area. Recent improvements in the Project Area have improved the roadway concerns for safety. The remaining crashes can mainly be attributed to congestion, which was discussed *Section 1.3.2.3, Traffic Capacity*. As noted, the intersection of 22nd Avenue South and 20th Street South and the intersection of 6th Street and I-29 Southbound would be at an unacceptable LOS with the traffic levels in 2045. The Project's goal is to improve safety by relieving congestion at both intersections.

1.4.3.3 Multi-Modal Transportation

The *2040 Comprehensive Plan* notes that "a transportation system should promote a variety of complementary transportation modes including motorists, bicyclists, pedestrians, and transit riders. At present, Brookings has a strong pedestrian system, an emerging bicycle system, and a well-respected and growing on-demand transit service" (City of Brookings 2018). The Project's goal is to incorporate a shared use path along 20th Street South from the intersection with 22nd Avenue South to 34th Avenue South.

2.0 ALTERNATIVES

The alternatives discussed within this SEA are limited to include the proposed changes to the 20th Street South and 22nd Avenue South intersection and not the original approved alternatives described in the 2020 EA. This section discusses the details of the No-Build Alternative and Revised Build Alternative.

2.1 NO-BUILD ALTERNATIVE

The No-Build Alternative considers the previously built I-29 20th Street South Interchange that was constructed after the 2020 EA and 2021 FONSI. The No-Build Alternative would not expand to the east-side corners of the intersection of 20th Street South and 22nd Avenue South. The intersection would continue to have tight corners which are difficult for trucks to utilize. The No-Build Alternative would not meet the needs of the Project causing issues with providing a roadway system connectivity for all traffic. Although the No-Build Alternative does not meet the purpose and need for the Project, it will be carried forward as a baseline for comparison of the potential impacts of the Revised Build Alternative. The No-Build Alternative would also not consider the preservation of the ROW needed for the future west-side widening of 22nd Avenue South. The Interchange Justification Report for the I-29 (20th Street South) interchange identified the future lane expansion for the intersection to maintain the LOS of C by 2045.

2.2 REVISED BUILD ALTERNATIVE

Within the 2020 EA, the Build Alternatives considered the improvements needed at the 20th Street South and 22nd Avenue South intersection (Figure 2-1). The improvements at the intersection that were constructed with the interchange avoided permanent impacts to the Edgebrook Golf Course. The traffic study completed during the 2020 EA noted that the improvements at the intersection completed during the construction of the interchange would meet the traffic needs at this location. Also, the traffic study completed during the 2020 EA noted that in the future this intersection would need further improvements to meet the 2045 LOS. An updated traffic study completed for this SEA confirmed that these improvements will be needed (Appendix A). The future improvements were noted as a separate future project from the construction of the interchange and would include turning lanes added to 20th Street South and 22nd Avenue South (Figure 2-1). The updated traffic study also considered specific development-related items such as access locations to minimize conflicts with traffic on 20th Street South.

Widening of the turn radii on the northeast and southeast corners was not considered as part of the Preferred Alternative in the 2021 FONSI since the Preferred Alternative would meet the LOS and avoid the time constraints of the BUILD Grant and Section 6(f) Permanent Conversion. After the construction of the interchange, the issues with trucks turning have confirmed the need for the additional improvements noted in Figure 2-1. Therefore, the Revised Build Alternative includes turning radii improvements and as well as the previously planned ROW preservation for the turning lanes on 20th Street South and 22nd Avenue South.

The Revised Build Alternative proposes the following for 2025 construction:

- Expand the northeast and southeast corners of the 20th Street South and 22nd Avenue South intersection to allow for trucks to turn without infringing on adjacent and opposite direction traffic lanes.

- Construct new crossing points for the Allyn Frerichs Trail along the east side of 22nd Avenue South since the to accommodate revised turning radius. In general, the trail would remain in its existing location, but the grade would be raised to meet ADA guidelines. Refer to Figure 2-2.

- Traffic signals on the east side of 22nd Avenue South installed with the 2022 / 2023 construction project would be moved for the expanded intersection corners.

- The Interstate Telecommunications Coop (ITC) building in the northeast quadrant of the 20th Street South and 22nd Avenue South intersection would be removed and replaced by the utility company to allow for the intersection widening. Refer to Figure 3-7.

Economic growth was noted in the 2020 EA and since this time development has continued to progress at this intersection and contributes to the Project's goal of economic growth. The properties on the west side of 22nd Avenue South either have been developed or will be developed by the time the roadway widening occurs. The ROW preservation for the future west side intersection improvements is included within this SEA due to development's progress at this intersection. Brookings has met and coordinated with the developers since the initial 2020 EA and 2021 FONSI process. Brookings is taking the future roadway ROW needs into account as they review and approve the development plans for the properties. The future roadway ROW is small slivers of parcels with no buildings located within the needed area. The property on the southwest corner of the 20th Street South and 22nd Avenue South intersection has been developed since the 2021 FONSI. Residences at this location were acquired and removed to accommodate the development, and the construction of a portion of the proposed street, Canasta Lane, was completed in support of this development. This occurred separately from the Project and was completed by private developers and Brookings. The completed development in the southwest quadrant is depicted in Figures 2-2 and 3-1.

The Revised Build Alternative would preserve the ROW for future widening of the existing 22nd Avenue South five-lane section north of 20th Street South and add a southbound right-turn lane by 2045 as a future construction project. The Revised Build Alternative does not include the construction of improvements, just the ROW preservation. The existing southbound 22nd Avenue South through lane now becomes a right-turn lane at 20th Street South. A southbound through lane would be added between Canasta Lane and 20th Street South just to accommodate the two southbound through lanes at the 20th Street South and 22nd Avenue South intersection. An eastbound right-turn lane would be added to 20th Street South on the west side of 22nd Avenue South. Refer to Figure 2-2. This SEA considers preservation of the ROW necessary for the future lane additions which would be required to further address increasing capacity needs and provide better connectivity for larger vehicles.

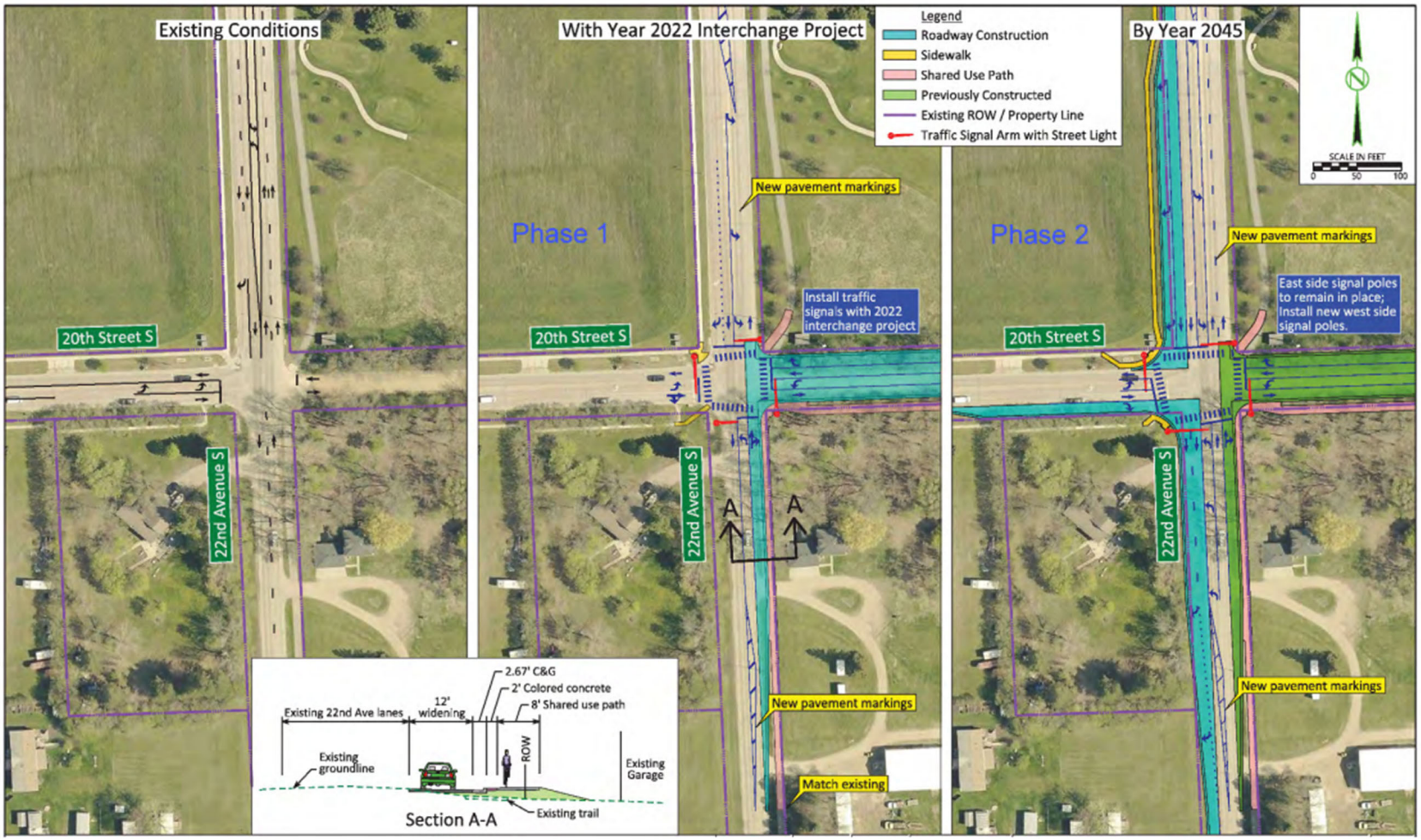


Figure 2-1. Proposed Improvements Discussed in the 2020 EA to the Intersection of 20th Street South and 22nd Avenue South

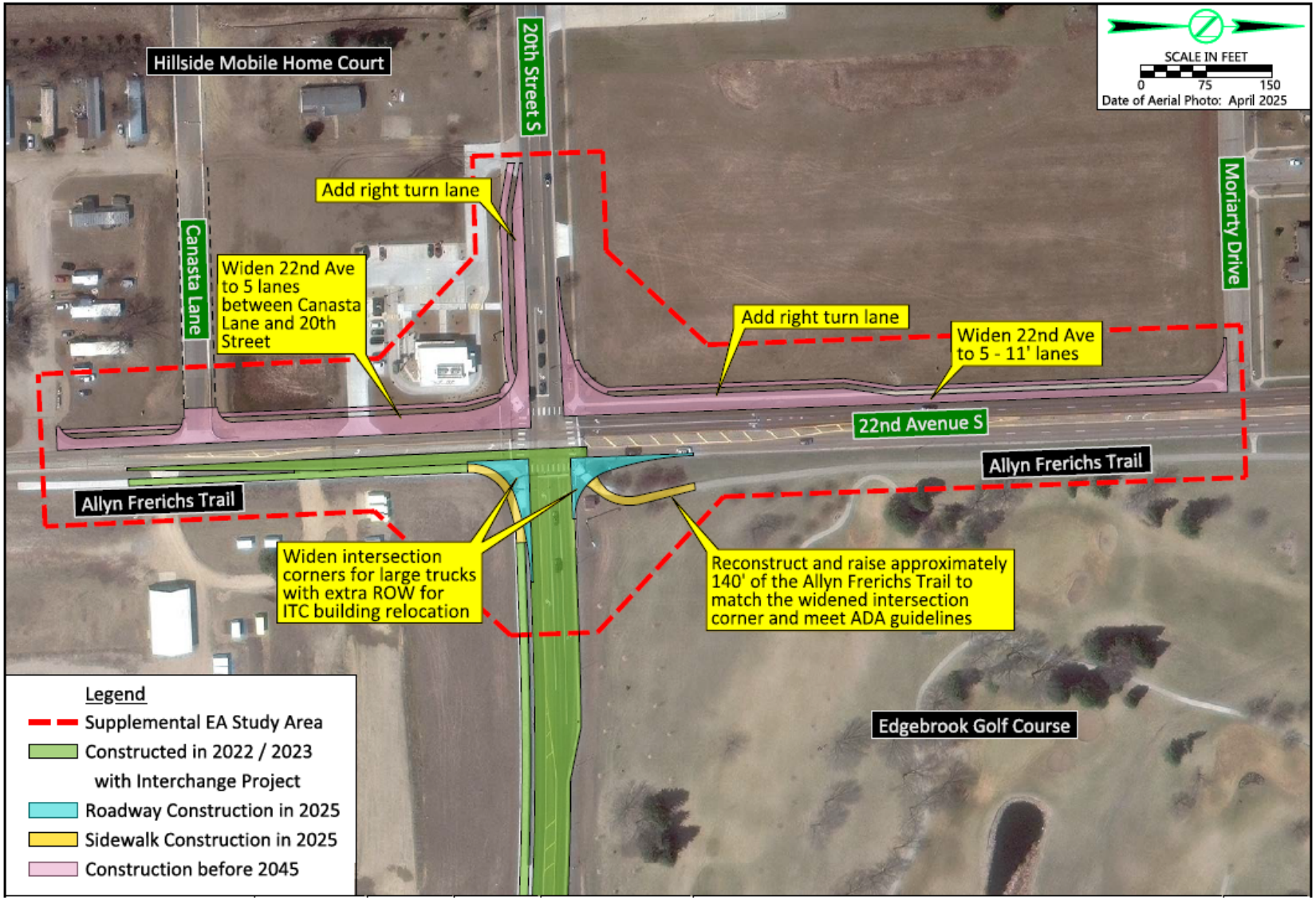


Figure 2-2. Supplemental EA Revised Build Alternative

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter includes a discussion of the existing social, economic, and environmental resources within the Study Area in remainder of the document. For this analysis, the Study Area includes an approximately 115-foot to 175-foot-wide corridor along the length of 22nd Avenue South where improvements would take place as part of the Revised Build Alternative. The Study Area is shown on Figure 1-1.

The 2020 EA documented the existing conditions and potential impacts to natural, cultural, and community resources. Table 3-1 lists each resource from the 2020 EA along with a current assessment of whether further review is needed. Resources determined to not be present within the Study Area and were therefore not reviewed in detail within this SEA include wild and scenic rivers, paleontological resources, climate change and equity, and prime and unique farmlands.

Table 3-1. Assessment of Resources Requiring Review

Resource	2020 EA Build Alternative Summary	Revised Build Alternative Summary	Further Review in SEA?
Land Use	Consistent with land use plans. Improved connectivity in the roadway system would facilitate the planned development in the Study Area, allowing Brookings to continue to grow, resulting in a moderate, beneficial effect on land use.	Would be consistent with the transportation and land use plan completed for the Brookings area. Land use within the Project Area has changed.	Yes

Resource	2020 EA Build Alternative Summary	Revised Build Alternative Summary	Further Review in SEA?
Social	Traffic congestion would be reduced, and emergency service response times would be maintained or improved. Rural areas would experience a minor, adverse effect due to conversion of property to urban areas. Traffic delays for residents to their places of employment would be reduced by at least approximately 2,000 miles and 100 hours for a one-way trip to work, resulting in an overall moderate, beneficial effect on the social environment.	Would improve the turning radius for trucks at 20th Street South and 22nd Avenue South intersection. Would be consistent with the analysis in 2020 EA so no further discussion or analysis is needed.	No
Economic Resources	Would provide connectivity in the transportation system, allowing planned development to proceed. The development is anticipated to create 300 new jobs, nearly $6 million in new earnings, and $1 million in new state and local taxes. Build alternative would have a moderate, beneficial effect on the local economy.	Would provide connectivity for truck traffic by meeting SDDOT truck turning radius guidelines at 20th Street South and 22nd Avenue South intersection. Development has changed in the area.	Yes
Acquisitions and Relocations	Would require the acquisition of five single-family residences.	Would not require acquisition of residences. Would require some acquisition of private and public property.	Yes

Resource	2020 EA Build Alternative Summary	Revised Build Alternative Summary	Further Review in SEA?
Pedestrians and Bicyclists	A segment of Allyn Frerichs Trail from the intersection of 20th Street South and 22nd Avenue South would be shifted to the east. This would provide a northbound left turn-lane on 22nd Avenue South. Currently during peak hours, drivers illegally use the trail to go around vehicles turning left onto 20th Street South. The safety for trail users would be improved. Therefore, the Build Alternative would have a moderate, beneficial effect on pedestrians and bicyclists. For the unavoidable temporary closure of this trail during construction, a feasible and safe detour route will be provided.	A segment of Allyn Frerichs Trail at the 20th Street South and 22nd Avenue South intersection would be re-graded for the widened intersection corners. A small segment of 20th Street South Shared-Use Path would be regraded at the connection to Allyn Frerichs Trail. A temporary detour for trail users would be utilized during construction.	Yes
Air Quality	Would result in a temporary increase in air emissions during construction. Following construction, a decrease in traffic congestion would lead to a decrease in emissions. Therefore, the Build Alternative would have a negligible effect on air quality.	Changes to type and number of vehicles is not anticipated. Would be consistent with the analysis in 2020 EA so no further discussion/analysis is needed. Area remains in attainment.	No

Resource	2020 EA Build Alternative Summary	Revised Build Alternative Summary	Further Review in SEA?
Noise	Six noise-related impacts are predicted because of the Build Alternative. Potential traffic noise abatement measures were determined to be not feasible. The Build Alternative is anticipated to have a minor, adverse effect on noise levels at six receptors along the eastern boundary of Edgebrook Golf Course and on portions of Allyn Frerichs Trail.	The Revised Build Alternative does not qualify as a Type I project and does not require the application of the SDDOT Noise Guidance.	No
Wetlands and Other Waters of the US	Approximately 0.49 acre of U.S. Army Corps of Engineer (USACE) non-jurisdictional wetland. The Build Alternative is anticipated to be permitted under a Section 404 nationwide permit. Overall, the Build Alternative would have a minor, adverse effect to wetlands and OWUS.	A field reconnaissance on April 23, 2025 noted that no wetlands or OWUS were present.	No
Water Quality	Would result in a minor increase in runoff from impervious surfaces due to the additional roadway. Therefore, the Build Alternative would have a minor, adverse effect on water quality.	Would result in a minor increase in runoff from impervious surfaces due to the widened corners at the 20th Street South and 22nd Avenue South intersection.	Yes

Resource	2020 EA Build Alternative Summary	Revised Build Alternative Summary	Further Review in SEA?
Vegetation, Fish, and Wildlife	Would have a negligible effect on the vegetation, fish, and wildlife populations in the Study Area. Habitat in the area is disturbed, and similar areas are available throughout the Study Area.	Would have a negligible effect on the vegetation, fish, and wildlife populations in the Study Area. Habitat in the area is disturbed, and similar areas are available throughout the Study Area. Would be consistent with the analysis in 2020 EA so no further discussion or analysis is needed.	No
Floodplain	The rise of the floodplain caused by the Build Alternative would be less than 1 foot. Therefore, it is anticipated that the Build Alternative would have a minor, direct, adverse impact on the floodplain.	There is no floodplain located within the Study Area for the Revised Build Alternative. No impacts to floodplain are expected.	No
Threatened and Endangered Species	Would have no effect to threatened and endangered species.	The Endangered Species listing status for several species and new species listed have occurred since 2020 (see Section 1.3). An updated species evaluation is required for the project.	Yes
Cultural Resources	Would have no effect to cultural resources.	Additional APE was determined, and Level III survey was completed. A determination of no historical properties affected was made for the supplemental area and SHPO concurred on December 18, 2024.	Yes
Regulated Materials	Regulated material sites would not be affected by, nor would they affect, the Build Alternative.	Regulated material sites would not be affected by, nor would they affect, the Revised Build Alternative.	No

Resource	2020 EA Build Alternative Summary	Revised Build Alternative Summary	Further Review in SEA?
Visual Impacts and Aesthetics	Would have a minor, adverse effect on the viewshed from Edgebrook Golf Course.	Minor impacts on the viewshed from Edgebrook Golf Course are anticipated. Most impacts would occur during the construction phase of the Project. Minor amounts of permanent impacts due to roadway widening and pathway realignment within the general area are also anticipated.	No
Section 4(f) and 6(f) Resources	South Dakota Game, Fish, and Parks (SDGFP) concurred with the proposed work within the golf course as part of the Build Alternative be considered a temporary non-conforming use under Section 6(f). A concurrence from Brookings would be requested of the proposed temporary occupancy exemption for the Edgebrook Golf Course and the de minimis use of the Allyn Frerichs Trail.	The Edgebrook Golf Course and the Allyn Frerichs Trail are both resources protected under Section 4(f). The Edgebrook Golf Course is also considered a Section 6(f) property. The Revised Build Alternative may have a use of Section 4(f) properties as well as an impact to a Section 6(f) property. Impacts to these resources will be minimized through the use of a detour for the Allen Frerichs Trail and mitigation for impacts to the Section 6(f) property, the Edgebrook Golf Course.	Yes

Resource	2020 EA Build Alternative Summary	Revised Build Alternative Summary	Further Review in SEA?
Utilities	Would require relocation of utilities, but impacts would be minor temporary adverse impacts. To minimize impacts, coordination has occurred with utility companies and Brookings. This coordination would continue prior to construction.	An existing communication hub building owned by ITC would be removed and replaced by ITC during project construction to allow for expansion of the east-side intersection corners (Figure 3-7). Other temporary impacts to local utilities are anticipated during construction. Coordination with Brookings and utility companies would continue throughout the construction process to minimize impacts.	Yes

3.1 RESOURCE NOT AFFECTED

The resource categories listed in this section were determined not to be impacted by this Project as discussed in Table 3-1. These resources are either not located within the Study Area or the impacts from the Project to the resource were determined to be so minor that a full review of the resource was not warranted in this SEA. Resources that are not detailed further include:

- Wild and scenic rivers
- Paleontological resources
- Climate change and equity
- Prime and unique farmlands
- Wetlands and Other Waters of the US

3.2 LAND USE

Land use and transportation are closely linked. Land use decisions can affect transportation mobility, accessibility, and safety as well as the environment and quality of life. Likewise, transportation decisions can affect land use, the environment, and quality of life as well as mobility, accessibility, and safety (Center for Environmental Excellence by AASHTO 2010). Land use was evaluated by determining the direct and indirect effects of the Project on existing land use (for example, recreation, residential, commercial, and industrial) and by verifying the consistency of the Project with development patterns and land use planning in Brookings.

3.2.1 Land Use Plans

As discussed in the 2020 EA, Brookings is a regional commerce and employment center located at the intersection of I-29 and US 14/6th Street. As the fourth largest community in South Dakota and the second largest community in the I-29 corridor, Brookings is just 58 miles north of Sioux Falls (South Dakota's largest metropolitan community) and 190 miles south of Fargo, North Dakota. Multiple plans have been completed for Brookings and were reviewed within the 2020 EA and the following is relevant to this SEA:

- ***Brookings South Dakota Comprehensive Plan 2040* (2018):** The *2040 Comprehensive Plan* included an in-depth evaluation of population and economic growth trends, land use trends and patterns, and transportation systems. This plan noted the area on the east side of I-29 to have potential for future industrial, commercial, and residential development areas, which would address the growth that will occur in Brookings (City of Brookings 2018).

- ***Brookings Area Master Transportation Plan* (2011):** This plan, completed in 2011, included origin-destination studies, projected future traffic volumes on the collector and arterial street systems, reviewed safety and crash data using the SDDOT Road Safety Inspection Program, conducted traffic counts, and calculated intersection LOS (HDR 2011).

- **Better Utilizing Investments to Leverage Development (BUILD) Grant Application, Bridging the Interstate Divide, 20th Street South Interchange Project (2019):** The BUILD grant application identified previously planned development areas near 20th Street South. These areas would help meet the needed residential, commercial, and industrial opportunities for this growing community. On the east side of I-29, an additional 20 acres of multi-family housing, 20 acres of commercial space, and 65 single-family lakefront properties could be developed. On the west side of I-29, 240 acres of future residential and 160 acres of commercial land could be developed (City of Brookings 2019).

3.2.2 Existing Land Use, Future Land Use and Planned Development

In the 2020 EA, the existing land use, future land use and planned development in the 2020 EA Project Area was identified and included in the analysis. This land use information was reviewed, and the current land use and planned developments were identified and included in the analysis for this SEA.

As noted in the 2020 EA, the land use plans in the area have been progressing since the completion of the 2040 Comprehensive Plan. Some plans have also progressed since the completion of the 2020 EA. Typically, developers create initial layouts for developable land and make Brookings aware of those areas. For the 2020 EA, the developable lands were noted by the developers to the City and Brookings Economic Development Corporation. As the development plans progress, the final development plans then are coordinated with Brookings. The 2020 EA noted residential and commercial development are noted within the Study Area for this SEA.

The following discusses the current existing land use and planned developments by each quadrant of the 20th Street South and 22nd Avenue South intersection (Figure 3-1):

- In the northeast quadrant is the Edgebrook Golf Course, a publicly owned property. This existing land use was noted within the 2020 EA and has not changed.

- In the southeast quadrant is a privately owned manufactured home community owned by Western Estates MHP LLC, a real estate business that provides rentable lots for modular homes. The property owner leases the lots to each manufactured homeowner. The remainder of the area is developable property that is privately owned and is planned for residential and commercial development. The parcel was rezoned in July 2023 from residential to business district. The 2020 EA noted that this area has a future development plan that includes both commercial and residential areas. The development plan is similar to the plan during the 2020 EA. These existing land use and future development plans were noted within the 2020 EA and have not changed.

- The northwest quadrant is a developable land that is vacant. A commercial development plan exists for a future gas station. This area was noted as a planned development area within the 2020 EA.

- The southwest quadrant has been developed and is currently a Starbucks Coffee Company location. The parcel was rezoned in March 2022 from agriculture to business. The developer also constructed Canasta Lane. This area was noted as a planned development area within the 2020 EA.

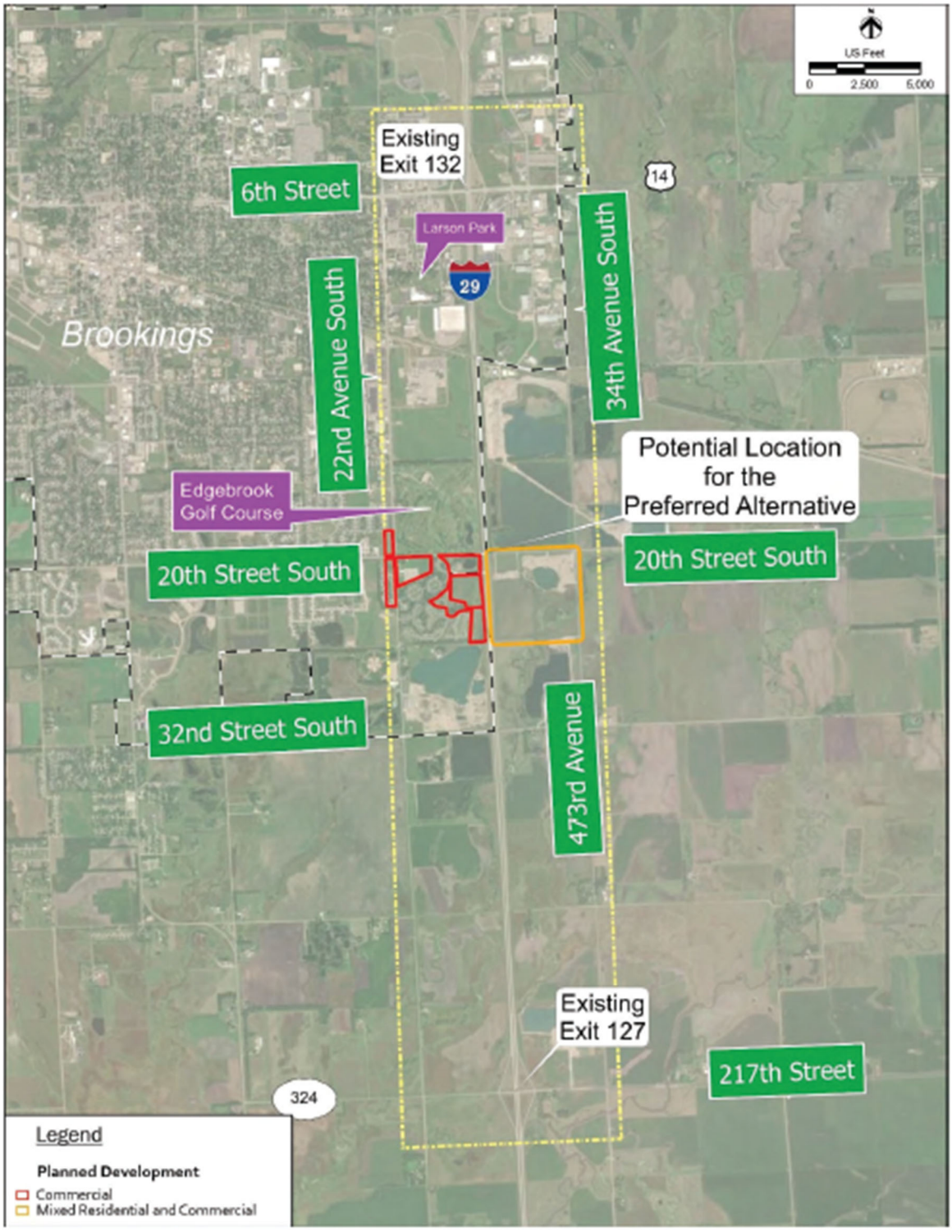


Figure 3-1. Planned Development Figure from 2020 EA

3.2.3 Environmental Consequences

3.2.3.1 No-Build Alternative

Under the No-Build Alternative, the intersection improvements and ROW preservation would not occur. The issues with the turning radius would continue and planning for the future improvements on the west side of the intersection would not be planned. The No-Build Alternative would not be consistent with the land use plan in the area, due to current and future concerns with the intersection.

3.2.3.2 Revised Build Alternative

The Build Alternative would improve the intersection, preventing the traveling public from being hindered at this location and would not prevent or inhibit planned development. During this SEA process, the following coordination occurred with the developers. This development occurred to coordinate the proposed ROW required for the proposed intersection improvements.

- For the development proposed in the southeast quadrant, coordination occurred with the landowner on September 9, 2024, and the intersection widening plan was provided. He requested the signal controller cabinet be shifted from the south side of 20th Street to the north side of 20th Street, this request was included in the design. This will reduce the visual obstruction to the development. The landowner has signed preliminary documentation noting the ROW and temporary easement needed for the Build Alternative. Therefore, the Build Alternative would not impact or be inconsistent with the planned development.

- For the proposed development within the northwest quadrant, Brookings reviewed the development plan and prepared H-lot plats for the ROW preservation area needed for the future 22nd Avenue west side widening. This area has been included within the developer's layout for the site. Therefore, the Build Alternative would not impact or be inconsistent with the planned development.

- For the proposed development within the southwest quadrant, Brookings reviewed the development plan and prepared H-lot plats for the ROW preservation area needed for the future west side improvements to the 20th Street and 22nd Avenue intersection and the 22nd Avenue widening. The City approved the final development plan that accounted for the future roadway improvements and purchased the roadway H-lots from the developer. Therefore, the Build Alternative would not impact or be inconsistent with the planned development.

The Build Alternative would be consistent with land use plans and has been coordinated for the ROW needed for the improvements to be incorporated into the development plans.

3.2.4 Mitigation Measures and Commitments

The City and Brookings County would need to coordinate transportation and land use plans to allow for expansion of the roadway system to accommodate future development.

3.3 ECONOMIC RESOURCES

During the completion of the BUILD grant, the economic benefit to Brookings from the construction of an interchange at 20th Street South, beyond the travel economic benefits, was considered. The 2020 EA noted

the Project would contribute to creating another east-west connection across I-29 that would create visibility and opportunity for planned development to proceed. To estimate the economic gain from the development, developers provided to the Brookings Economic Development Corporation their planned development areas in the Project Area which were considered in the 2020 EA Analysis (City of Brookings 2019). The following was noted for this SEA analysis:

- In the southeast quadrant of the intersection, 33 acres are planned for commercial development. This includes a 400,000 square-foot commercial and retail property, 460,000 square feet of residential multi-family above commercial space, and nearly 100,000 square feet of storage space. The current future development plan for this area remains the similar to the plan reviewed for the 2020 EA.

- On the west side of the intersection of 22nd Avenue South and 20th Street South, two additional areas, totaling 9 acres, are identified as planned commercial development. The southwest parcel has been developed as a Starbucks Coffee Company location, construction was completed in 2024. The northwest parcel has a development plan for a convenience store.

3.3.1 Environmental Consequences

3.3.1.1 No-Build Alternative

Under the No-Build Alternative, the intersection would not be improved, and issues would remain. Over time without the improvements on the east side of the intersection and future improvements on the west side of the intersection, development in the area would be affected. Travelers trying to access these commercial businesses would have more difficulty accessing this area.

3.3.1.2 Revised Build Alternative

Design techniques were used to minimize, to the extent possible, impacts on the existing businesses and future development plans during the 2020 EA process and this SEA process. The proposed ROW areas within the planned developments were coordinated with their layout plans, to avoid conflicts. Section 3.2.3.2 discussed the coordination that occurred with each development. The development of the areas would contribute to the overall economic growth of Brookings by providing improvements to the intersection, allowing better connectivity to the commercial and residential areas.

3.3.2 Mitigation Measures and Commitments

Access would be maintained to businesses from a public street during construction. Access signs indicating individual businesses by name would be included in construction signing. Construction would be phased to minimize traffic congestion impacts and overall time of construction in the Project Area.

3.4 ACQUISITIONS AND RELOCATIONS

Acquisition would be the temporary or permanent purchase of property for the construction of a project. Relocation is required when a project is likely to displace people from their homes, businesses, or farms, meaning that the project would need to acquire property which would result in the relocation of individuals or communities. A field survey and aerial photos were used to identify business and residence locations in the Study Area. Refer to Figure 3-2 for additional information and discussions of property acquisition in the Study Area. Utility relocations are discussed in Section 3.10.

Since the completion of the 2020 EA, the properties on the west side of 22nd Avenue South have been or are currently planned for developed. In the southwest quadrant of the intersection, the parcel has been developed by a private owner, separate from this Project. In the northeast quadrant, Brookings is in the process of reviewing the development plan.

On the east side of the intersection, the Edgebrook Golf Course occupies the northeast quadrant and is a Section 6(f) property. As a Section 6(f) property, specific requirements are discussed in Section 3.9. In the southeast quadrant, the buildings previously at this location were removed by the property owner.

3.4.1 Environmental Consequences

3.4.1.1 No-Build Alternative

The No-Build Alternative would not require acquisition of property nor directly change or result in relocation of existing businesses, residences, and structures.

3.4.1.2 Revised Build Alternative

The Revised Build Alternative includes the acquisition of property for the current planned improvements on the east side of the intersection, and preservation of ROW on the west side of the intersection for future widening of 22nd Avenue South. The reconstruction of the east side of the intersection is needed now to address the issues with truck turning. ROW preservation would occur on the west side of the intersection along 22nd Avenue South. ROW preservation is utilized in areas that are being developed and are known areas that need improvements within the planning horizon, in this case 2045, to help reduce the conflict later as the improvements are needed to the roadway. The Revised Build Alternative would require the ROW preservation and ROW acquisition as illustrated in Figure 3-2 and as listed in Table 3-2.

Table 3-2. Anticipated Property Acquisition

Acquisition Type	20th St S / 22nd Ave Location	Area (sq. ft.)
ROW preservation	Southwest quadrant private property	3,114
	Northwest quadrant private property	13,035
ROW acquisition	Southeast quadrant private property	621
	Northeast quadrant Edgebrook Golf Course	8,396

The Revised Build Alternative would not require the acquisition and relocation of residences. For discussion of the relocation required for utilities, refer to Section 3.8.

ROW preservation to account for the future (prior to year 2045) widening of the west side of 22nd Avenue South of the roadway ROW while the properties are vacant avoids acquisition of developed property in the future which could negatively impact the function of the property. Brookings is responsible for working with the developers through the platting process and paying owners for the private property that would be needed for the west side widening of 22nd Avenue South. See Section 3.2.3 for a discussion of the coordination that has occurred for each development area. As of April 2025, the property in the southwest quadrant of the intersection has partially been developed into a Starbucks Coffee Shop and Brookings paid for the area that would be needed for future widening of 22nd Avenue South. Brookings is in the development plat review process for the property in the northwest quadrant and negotiating with the landowner on the ROW area.

For the ROW acquisition for the Edgebrook Golf Course, a specific process is required for compliance with Section 6(f). To initiate the process, coordination was completed with the South Dakota Game Fish and Parks (SDGFP) and National Park Service (NPS) to discuss the proposed ROW acquisition, which under Section 6(f) is considered a Conversion of Use. Conversions of Use require the identification of a mitigation area that is equal value to the area that is permanently converted as ROW. Typically, the mitigation area must be adjacent to the existing park, or the park area needs to be replaced at a new location. The ROW acquisition area and proposed mitigation had a yellow book appraisal process to confirm the area is replaced with an equal value area. Refer to Section 3.7 for further discussion of the mitigation area and of the process.

3.4.2 Mitigation Measures and Commitments

Acquisitions would be conducted in conformance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended by the Surface Transportation Assistance Act of 1987 and 49 CFR, Part 24, effective April 1989.

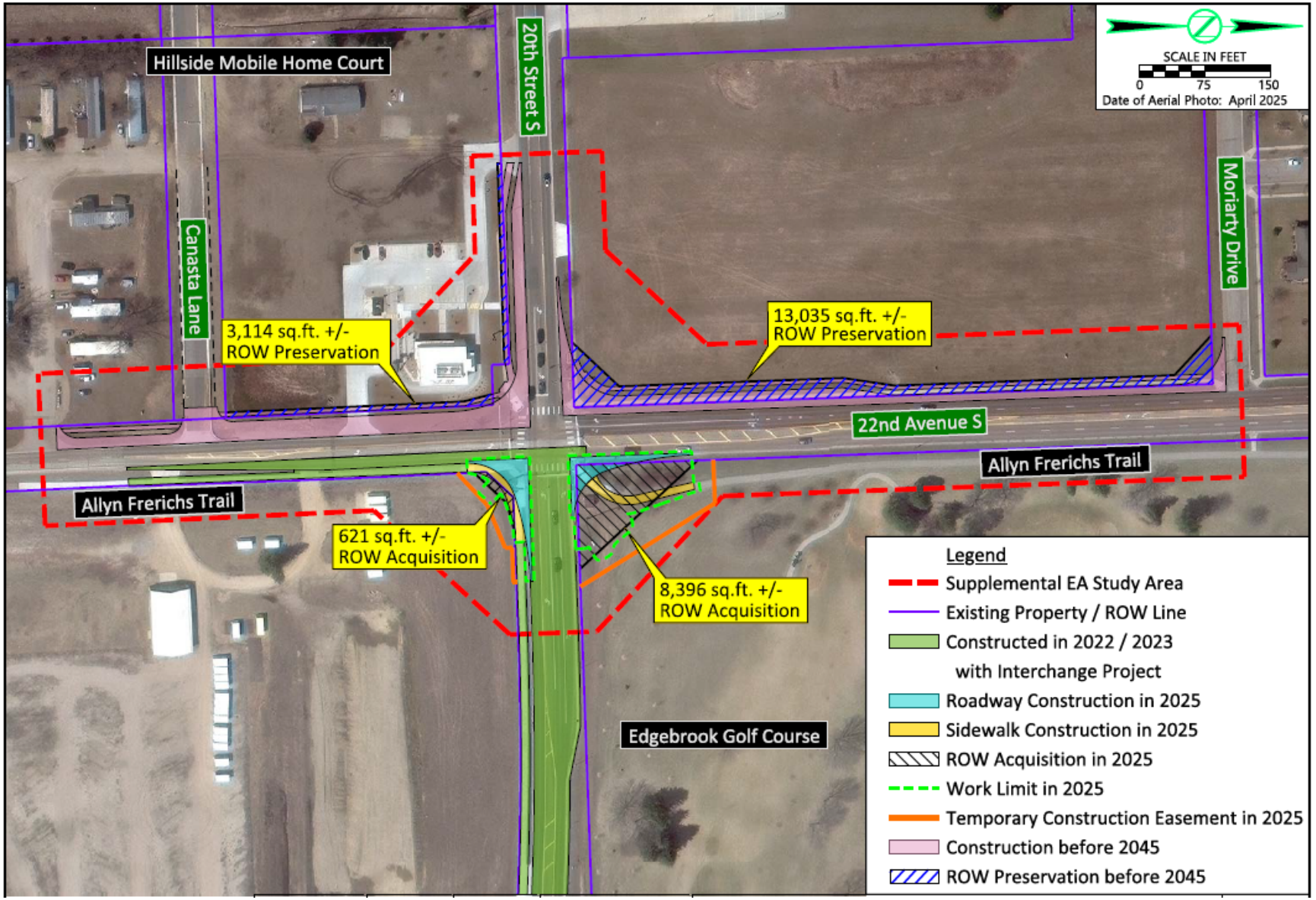


Figure 3-2. Permanent ROW Needs

3.5 PEDESTRIANS AND BICYCLISTS

Brookings has a well-developed system of pedestrian and bicycle trails. The *Brookings Bicycle Master Plan* was developed to make the community more bicycle friendly and includes future routes and facilities (on-street and off-street) to supplement existing bicycle and trail infrastructure (City of Brookings 2017). By 2040, the vision of the plan is to make Brookings a Platinum Bicycle Friendly Community, where safe and comfortable bicycling trips throughout Brookings are made by residents, students, and visitors. Please refer to Figure 3-3 for future and existing trails in vicinity of the Study Area.

The *2040 Comprehensive Plan* notes that "a transportation system should promote a variety of complementary transportation modes, including motorists, bicyclists, pedestrians, and transit riders. At Presently, Brookings has a strong pedestrian system, an emerging bicycle system, and well-respected and growing on-demand transit service. The use of these modes is expected to grow and should be incorporated into development standards and city budgets" (City of Brookings 2018).

The Allyn Frerichs Trail is an existing paved, shared use trail within the Study Area. The trail begins north of Exit 132 and continues south on the east side of I-29. The trail crosses under I-29 at the railroad tracks and then continues south until it reaches Edgebrook Golf Course. The trail turns west and goes along the north side of the golf course and then turns south and goes along the west side of the golf course, on the east side of 22nd Avenue South in the Study Area. Brookings Parks, Recreation, and Forestry Department maintains and manages the Allyn Frerichs Trail.

Brookings also identifies a mixed-use pathway on the south side of 20th Street South, between 22nd Avenue South and I-29 (City of Brookings, 2025). This is referred to in this SEA as the 20th Street South Shared-Use Path, which continues east until the intersection with 34th Avenue South as shown in Figure 3-3. It should be noted that there are no connections to other trails or mixed-use pathways at the 34th Street intersection at this time so the mixed-use pathway on the south side of 20th Street South will essentially be a "dead end" pedestrian pathway until the trail system is further developed. Brookings is constructing this path further from the 20th Street South and 22nd Avenue South intersection to the west along 20th Street South during the Summer 2025.

The *Brookings Bicycle Master Plan* noted potential future shared use trails. The future shared use trails shown in the plan include the Allyn Frerichs Trail becoming part of a potential US Bicycle Route 55 alignment through Brookings. In addition, main arterials US 14 and 6th Street and 22nd Avenue South, were noted as accommodating either shared use paths or separated bike lanes in the future (City of Brookings 2017).

Currently, the undersized turn radius at this intersection causes vehicles (including large trucks) to encroach on the shared use path located on the corner to make the turn into the proper lane. This poses a risk of collision for pedestrians, bicyclists, and motorists.

3.5.1 Environmental Consequences

3.5.1.1 No-Build Alternative

No improvements to the existing identified pedestrian or bicycle facilities would be made as part of the No-Build Alternative. The tight corners of the intersection of 20th Street South and 22nd Avenue South has led to trucks damaging the traffic signal (including the pedestrian indicators) and knocking over pedestrian push button poles. This poses a hazard to pedestrians crossing the intersection. A portion of the existing trail

exceeds ADA longitudinal grade guidelines. The No-Build Alternative would have a continued moderate adverse effect on pedestrians and bicyclists. The No-Build Alternative would have no impact on future shared use pathway construction within or adjacent to the Study Area.

3.5.1.2 Revised Build Alternative

The Revised Build Alternative would improve pedestrians and bicycle facilities. The Revised Build Alternative would create a widened turning radius so trucks can make the turns without damaging signal equipment. Widening of the turn radius would also minimize the risk of trucks driving on the shared use path where pedestrians/bicyclists may be located.

The Allyn Frerichs Trail would be raised to meet ADA guidelines, which meet the Project Goal of multi-modal transportation in this area. The Revised Build Alternative would temporarily impact a small portion of the path and access to the path at the intersection. This Project would not impact future trail planning within the area. Therefore, the Revised Build Alternative would have a beneficial effect on pedestrians and bicyclists. The 20th Street South Shared-Use Path was constructed during the completion of the interchange. However, currently there are no connections to that trail between 22nd Avenue South and 34th Avenue South. There also are no pedestrian facilities along 34th Avenue South or on 20th Street South to the east of 34th Avenue South. So, until the trail system is further developed in the future, the shared-use path along the south side of 20th Street South is essentially a “dead-end” facility.

The Allyn Frerichs Trail is considered a Section 4(f) property since it is an existing recreational pedestrian and bike trail, and the Revised Build Alternative would constitute a use under Section 4(f). Please refer to Section 3.9 for further discussion of Section 4(f). The Revised Build Alternative would have no impact on future shared use pathway construction within or adjacent to the Study Area.

3.5.2 Mitigation Measures and Commitments

The following are the commitments that are required for the Project and will be completed by the Brookings and SDDOT:

- Access to the Allyn Frerichs Trail would be restricted for a period that is anticipated to be less than the time needed for construction.
- A detour would be provided due to the temporary closure of the Allyn Frerichs Trail. Sheet 19 of the construction plans provides a detour layout for the temporary closure of the Allyn Frerichs Trail. The detour is also shown on Figure 3-4. Signage would be provided to direct users around the construction.
- Temporary construction fencing would be installed along proposed construction limits near the Allyn Frerichs Trail.
- Appropriate signage would be installed to alert users of the Allyn Frerichs Trail of construction activities, access restrictions or closures, and to direct users to secondary access points.
- The Contractor would be required to closely coordinate the construction schedule with SDDOT Environmental Manager (605.773.3721) and Brookings Parks, Recreation, and Forestry Director (605.692.2708) at the preconstruction meeting.

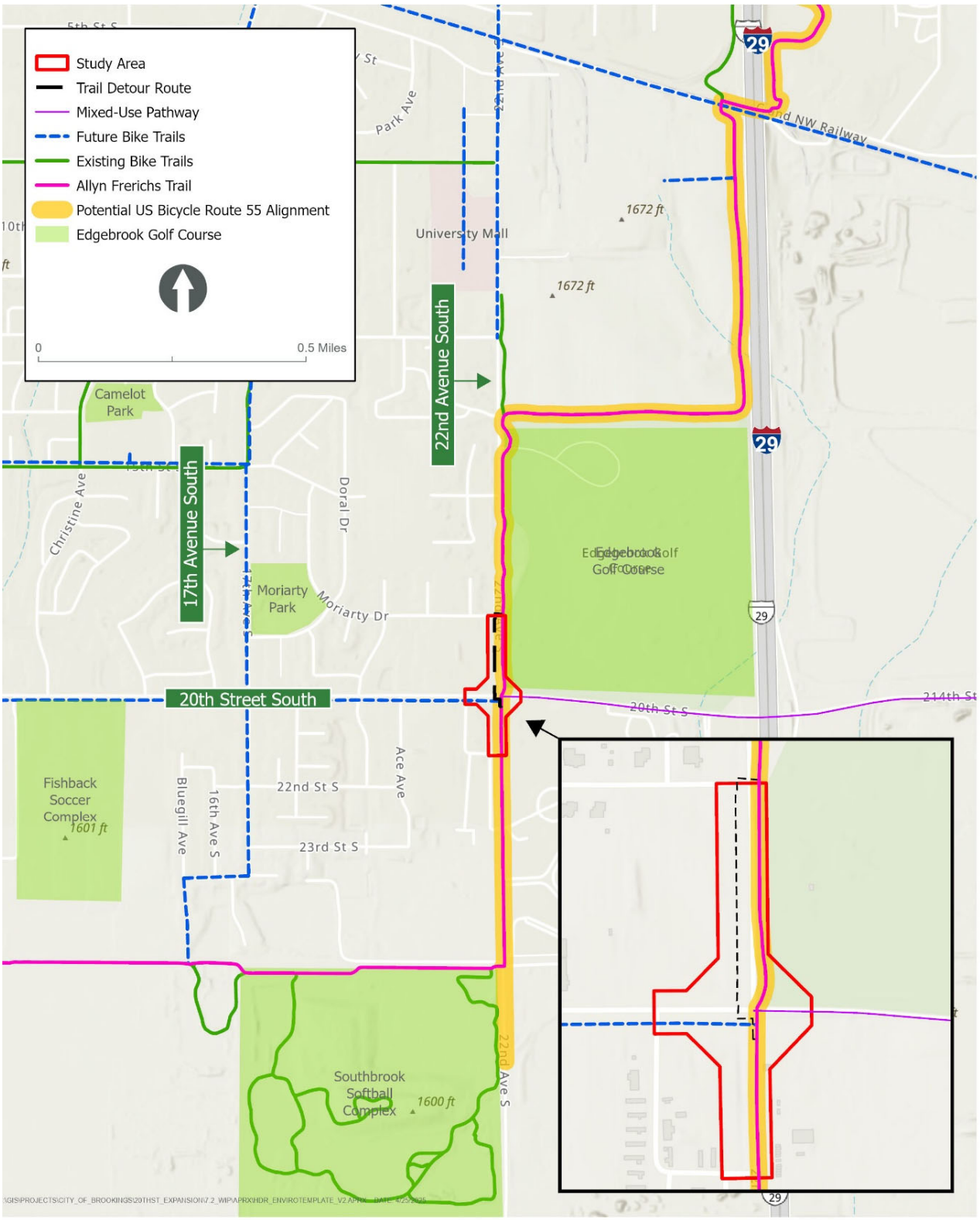


Figure 3-3. Existing Pedestrian and Bicyclist Trails and Proposed Detour

Figure 3-4. Pedestrian Detour Layout

3.6 WATER QUALITY

The Clean Water Act provides for the establishment of water quality standards, control of discharges, development of wastewater treatment management plans and practices, prevention or minimization of the loss or degradation of surface waterbodies and groundwater, and the regulation of other issues concerning water quality. The purpose of this section is to determine if the Project has the potential to exceed water quality standards from the discharge of surface water runoff, cause impact on the groundwater and water supply/drinking water sources or affect wastewater treatment management plans and practices.

The Study Area is located within the Upper Big Sioux Watershed (SDDANR 2024a). One isolated wetland was identified via desktop delineation within the Study Area. No other surface water resources were identified in the Study Area upon desktop review. No impaired waterbodies were identified within the Study Area.

No major aquifers are mapped within the Study Area (SDDANR 2024b). The residences and businesses within the Study Area receive their drinking water through Brookings Municipal Utilities. Brookings receives its water supply from the Big Sioux Aquifer and the wells are located outside of the Study Area. The Big Sioux Aquifer covers an area of approximately 20 square miles, with a drainage area of approximately 100 square miles. The drainage area provides an average recharge of water into the aquifer of 9 billion gallons annually (Brookings Municipal Utilities 2024). No water plants are located within the Study Area.

3.6.1 Environmental Consequences

3.6.1.1 No-Build Alternative

Under the No-Build Alternative, no additional ground disturbances would occur, therefore no surface water or groundwater impacts would be anticipated within the Study Area.

3.6.1.2 Revised Build Alternative

The Revised Build Alternative would increase the existing area of disturbance due to the addition of lanes on 22nd Avenue South and the widened intersection corners. Minor increases in surface water runoff may occur with the increased disturbance areas and changes in land use from vegetated ROW to paved surfaces. This minor increase in surface water runoff is anticipated to cause a minor permanent increase in surface runoff post construction of the Project.

Coordination occurred with SDDANR and their response on November 20, 2024, noted that the Project would not have any adverse environmental effects to drinking water in this area and is unlikely to have adverse effects to groundwater quality (Appendix A B). The Revised Build Alternative is anticipated to have minor, adverse effects on water quality due to the slight increase in impervious area within the Study Area from existing conditions.

Any construction activity that disturbs an area of 1 or more acres of land must have authorization under the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activities. The permit can be obtained through coordination with SDDANR. The Project would disturb less than 1 acre and therefore does not require the NPDES General Permit.

3.6.2 Mitigation Measures and Commitments

SDDANR in their November 20, 2024, response noted that at a minimum, and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of the pollutants from the construction site (Appendix AB).

Any groundwater wells would be confirmed during physical survey and, if impacted, would be properly capped and sealed. Any impacted wells and connections would be replaced with properties that were not fully acquired.

3.7 THREATENED AND ENDANGERED SPECIES

Section 7 of the ESA, as amended, applies to federal actions and sets forth requirements for consultation to determine if the proposed action may affect a threatened or endangered species. If a threatened or endangered species or its critical habitat may be affected, Section 7(a)(2) of the Endangered Species Act

requires the federal lead agency to consult with USFWS or the National Marine Fisheries Service, as appropriate, to ensure that the project does not jeopardize the continued existence of the affected species. Threatened, endangered, candidate, and proposed federally listed animal and plant species and their habitats that exist in the affected environment must also be considered. Plant or animal species with special status are also included.

A search of the USFWS Information for Planning and Consultation (IPaC) database (Project Code 2025-0023938) indicated that three threatened, two endangered listed species, and two proposed threatened species may be present in the Study Area (USFWS 2024a). The threatened, endangered, and proposed threatened species that may be present in the Study Area include the following:

- **Northern Long-eared Bat (*Myotis septentrionalis*) – endangered status:** The northern long-eared bat is a medium-sized bat that occurs across the central, eastern, and northern portions of the United States and across Canada. The species decline is primarily attributed to white-nose syndrome. The western population of the northern long-eared bat occurs in several states, including South Dakota. The species commonly roost singly or in colonies in the trees of forested areas and, to a lesser extent, in caves, mines, and structures (USFWS 2024b). A field reconnaissance was completed to identify if any suitable habitat is present in the Study Area. Northern long-eared bat habitat is presumed to not be present as the Study Area has a limited number of trees and is within an urban area near a high traffic corridor. No exfoliating bark or snags were present.

- **Rufa Red Knot (*Calidris canutus rufa*) – threatened status:** The rufa red knot is a medium-sized shorebird and makes one of the longest-distance migrations known, migrating up to 19,000 miles annually (USFWS 2024c). The rufa red knot has a large range and can be found during portions of the year as far south as Brazil but often breeds in the central Canadian arctic (USFWS 2024c). While most red knots follow migration routes along the east or west coasts of North America, small numbers of these species follow an inland migration route, which may include stopovers in the Great Plains (USFWS 2024c), including South Dakota. Preferred stopover habitat includes gravely or sandy beaches, tidal mudflats, salt marshes, shallow coastal impoundments, and peat banks. Stopovers are defined as places where migrant birds stop to rest, drink, and eat during migration or after long flights (USFWS 2024c). There are no suitable sand or gravel bars, tidal mud flats, salt marshes, or peat banks in the Study Area.

- **Topeka Shiner (*Notropis topeka)* – endangered status:** The Topeka shiner is a small minnow species (up to three inches) that lives in low-order streams on the prairies of the Great Plains states. Critical habitat is designated Nebraska, Minnesota, and Iowa but no critical habitat has been designated in South Dakota. The Topeka shiner inhabits moderately clear creeks with bottoms of gravel, sand, bedrock, or rubble. The species spawns in silt-free gravel from May to July and spawns over the nests of green and orange-spotted sunfish (USFWS 2020a, Missouri Department of Conservation 2024). This species can only live in streams and no streams are present in the Study Area. There is no suitable habitat or designated critical habitat in the Study Area.

- **Dakota Skipper (*Hesperia dacotae*) – threatened status:** The Dakota skipper is a small butterfly that relies on healthy native prairie within its current range of North Dakota, South Dakota, Minnesota, Manitoba, and Saskatchewan to complete its life cycle (USFWS 2019). The Dakota skipper overwinters as larvae in shelters at ground level, relying on medium-stature native grasses, such as prairie dropseed (*Sporobolus heterolepis*), little bluestem (*Schizachyrium scoparium*), and sideoats

grama (*Bouteloua curtipendula*) for growth and survival to complete one generation per year. The adult Dakota skipper requires a diversity of flowering forbs as a nectar source during its flight period from late June to early or mid-July. Two preferred adult habitat types have been identified throughout the range of the Dakota skipper, consisting of moist bluestem prairie (Type A) and upland mixed-grass prairie (Type B; USFWS 2024d). There is no designated critical habitat within the Study Area. Because the Project would occur within a previously disturbed road corridor and native moist bluestem prairies or upland mixed-grass prairies are not found within the Study Area, no suitable habitat exists within the Study Area.

- **Monarch Butterfly (*Danaus plexippus)* – proposed threatened status:** Monarch butterflies are large butterflies with orange wings bordered by black and two rows of white dots reside within the black. Monarchs require milkweed plants to host their eggs and larvae hatch two to five days later and go through five molting periods over the next couple of weeks feeding on the milkweed. Multiple generations can be produced each breeding season as most adults only live two to five weeks but can also overwinter for up to nine months. Monarchs in temperate climates migrate up to 3,000 km to warmer areas to overwinter and then return in the spring (USFWS 2024e). Threats to habitat include loss of milkweed, grassland conversion for agricultural use, and widespread herbicide use. While not officially listed, it is proposed to be listed as threatened (USFWS 2024e). No designated critical habitat is within the Study Area. Due to the previously disturbed nature of the intersection and road corridor, there is no suitable habitat for the monarch butterfly within the Study Area.

- **Western Regal Fritillary (*Argynnis idalia occidentalis*) – proposed threatened status:** The western regal fritillary has a wingspan of three to four inches known for its distinctive rusty orange forewings and black hindwings with white spots across the middle of the wing currently occupies 14 states and historically inhabited a larger area. Caterpillars can be black, yellow, or orange with orange or red stripes and with yellow and black spines (Moorehouse 2022). The species requires areas where large tracts of grasslands are intact, close together, and remain unconverted (USFWS 2024f). Land conversion and agricultural development are the greatest causes of habitat loss. While not officially listed, it is proposed to be listed as threatened. No designated critical habitat is in the Study Area. Due to the previously disturbed and urban nature of the survey area, there is no native grassland and therefore no suitable habitat is within the Study Area.

- **Western Prairie Fringed Orchid (*Platanthera praeclara*) – threatened status:** Western prairie fringed orchids occur west of the Mississippi River and currently occur in Iowa, Kansas, Minnesota, Nebraska, North Dakota, and Manitoba, Canada (USFWS 2024g). Preferential habitat includes wet, unplowed tallgrass prairies and meadows; however, western prairie fringed orchids have been found in fields and roadside ditches. Habitat loss and degradation, primarily through conversion to cropland, is the greatest threat to the orchid (USFWS 2021). Because the Project would occur in a highly disturbed area, no native tallgrass prairie habitats or wet meadows suitable for populations of western prairie fringed orchid exist in the survey area.

State threatened or endangered species and species of management concern (designated species that require both control and protection) are regulated under South Dakota Statutes 34A-8 and 34A-8A, respectively. SDGFP maintains a list of species determined to be threatened or endangered in South Dakota. In the SDGFP response dated December 23, 2024, the SDGFP noted no concerns with the Project (Appendix A). During coordination with SDGFP, the agency noted that habitat surveys should be completed for the northern long-eared bat. As noted in the above discussion, these surveys were completed and the species

not believed to inhabit the Study Area (, Phase I Habitat Assessments, Northern Long-Eared Bat Habitat Assessment Data Sheet). SDGFP also noted that any activities impacting streambeds should not be completed during fish spawning periods that take place from April through June. No streams are located within the Study Area.

3.7.1 Environmental Consequences

3.7.1.1 No-Build Alternative

The No-Build Alternative maintains the Study Area as is. The No-Build Alternative would not change the relationship between the existing roads and threatened or endangered species. Therefore, there would be no effects on threatened or endangered species associated with the No-Build Alternative.

3.7.1.2 Revised Build Alternative

As discussed above, no suitable habitat for the above listed and proposed species was identified in the Study Area. Therefore, based on lack of suitable habitat, the Revised Build Alternative is anticipated to have no effect on these species. On January 21, 2025, USFWS replied to the scoping letter sent to their agency, they noted no concerns with the Project (Appendix B).

3.7.2 Mitigation Measures and Commitments

No mitigation measures or commitments are required.

3.8 CULTURAL RESOURCES

Historical, architectural, archaeological, and cultural resources that would be affected by federally funded/licensed undertakings come under the protection of the National Historic Preservation Act of 1966 (16 United States Code 470), as amended. Section 106 of this act requires federal agencies to consider the effects of such undertakings on properties listed, or eligible for listing, in the National Register of Historic Places (NRHP). Regulations related to this process are described in 36 CFR Part 800, Protection of Historic Properties. A broader range of cultural resources comes under the protection of Section 4(f) of the USDOT Act of 1966, which requires projects funded by USDOT to avoid significant historic sites unless there is no "feasible and prudent" alternative. In general, this provision applies to resources that are listed, or eligible for listing, in the NRHP. However, at the discretion of USDOT, Section 4(f) protection may also be extended to properties that do not meet NRHP criteria as long as the responsible jurisdiction advocates Section 4(f) status.

The Area of Potential Effect (APE) is the geographic area or areas within which an undertaking may cause changes in the character or use of historic properties or archaeological sites. A potential effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for listing in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Examples of adverse effects include physical damage or alteration of the property, change of the character of the property's use or of physical features within its setting that contribute to its historical significance, and introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features. Therefore, the APE for historic properties is the area that contains a property that would be acquired or physically disturbed to the extent that its current use may be affected, or that would be significantly visually affected by the alternatives

under consideration. For archaeological sites, the APE is the area where the ground could be disturbed as a direct or indirect consequence of the alternatives under consideration.

A Level III Cultural Resources Survey and Report were completed in the APE identified for this SEA in September 2024. A series of shovel tests were excavated in portions of the APE that appeared to be undisturbed from previous development. No archeological sites were identified within the APE (Augustana Archeological Lab 2024).

3.8.1 Environmental Consequences

3.8.1.1 No-Build Alternative

The No-Build Alternative would not impact historic structures or archaeological sites in the Study Area.

3.8.1.2 Revised Build Alternative

No historic properties or archeological sites were identified within the APE. Therefore, a determination of no historic properties affected was recommended in the Level III Cultural Resources Report (Augustana Archeological Lab 2024). A letter from SDDOT was sent to the State Historical Preservation Office (SHPO) on December 13, 2024, recommending an effect determination of no historic properties affected. On December 18, 2024, SHPO responded by concurring with the effect determination of no historic properties effected (Appendix A).

3.8.2 Mitigation Measures and Commitments

If historic properties are discovered, the SDDOT would notify the SHPO and coordinate the next steps.

3.9 SECTION 4(F) AND 6(F) RESOURCES

Section 4(f) of the USDOT Act of 1966 requires determination of whether a US Department of Transportation (USDOT) proposed project would adversely affect or occupy a Section 4(f) resource. Additionally, Section 6(f) of the Land and Water Conservation Act (LWCF) of 1965 (Section 6(f)) requires approval from the NPS for converting land that has been paid for in part or in entirety by LWCF grants to non-park or non-recreation uses.

No historic properties are listed or eligible for listing on the NRHP located within the Study Area. Refer to Section 3.6. There are publicly owned parks and recreation areas that are open to the public as follows and is shown on Figure 3-3. The use of and impact to the Section 4(f) and 6(f) properties by the Revised Build Alternative are discussed in the following sections.

Edgebrook Golf Course

Edgebrook Golf Course is a municipal 18-hole facility with a 9-hole junior/short course located at 1415 22nd Avenue South (Figure 3-5). It is owned and operated by Brookings. Fees are reviewed and set annually by the Brookings Park, Recreation, and Forestry Board and include single rounds of golf and seasonal passes. Section 4(f) applies to the golf course because it is owned, operated, and managed by a public agency for the primary purpose of public recreation. Randy Kittle, the Grants Coordinator with the SDGFP, Division of Parks and Recreation, confirmed that three LWCF grants (46-00166, 46-00304, and 46-01035) were used to develop Edgebrook Golf Course and that the entire boundary of the golf course is protected under Section

6(f) for public outdoor recreation (R. Kittle, personal communication, June 24, 2024). Section 6(f) applies to the property boundary at the time the LWCF grant funds were used for development of the golf course.

Allyn Frerichs Trail

The Allyn Frerichs Trail is an existing paved, shared use trail designated and functioning primarily for recreational use. Brookings Parks, Recreation, and Forestry Department maintains and manages the trail and has confirmed the significance of this trail as part of its recreation system. The trail begins north of Exit 132 and continues south on the east side of I-29. The trail crosses under I-29 at the railroad tracks and then continues south until it reaches Edgebrook Golf Course. The trail turns west and goes along the north side of the golf course and then turns south and goes along the west side of the golf course, on the east side of 22nd Avenue South within the Study Area. The trail continues west through portions of Brookings residential areas and connects to several park trail systems (City of Brookings 2010). The Allyn Frerichs Trail is part of a planned trail loop. The loop, when complete, would provide connections to a larger system of existing and planned shared use paths that have been identified in the Brookings Master Drainage Plan and Master Park Plan (City of Brookings 2017). The trail is also under consideration as part of a potential US Bicycle Route 55 alignment (City of Brookings 2017). For more information on pedestrian and bicyclist accommodation, please refer to Section 3.5. Brookings Parks, Recreation, and Forestry Department has confirmed that this trail is a Section 4(f) property. Section 4(f) applies to the trail because it is a publicly owned, shared use path designated and functioning primarily for recreation (Appendix C). Section 6(f) does not apply because the SDGFP Grants Coordinator confirmed that LWCF grant funds were not used to create the trail (Appendix A).

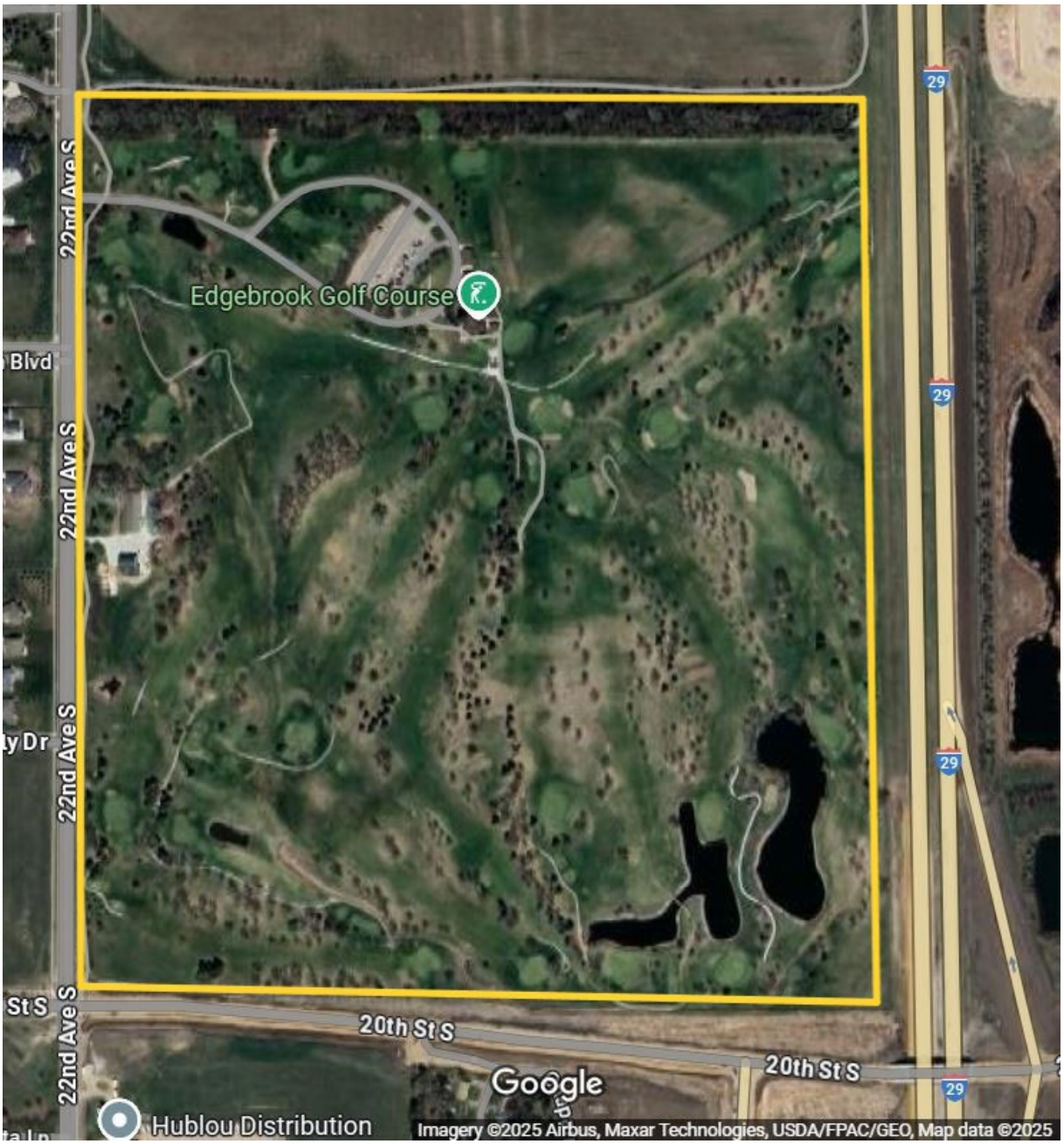


Figure 3-5. Edgebrook Golf Course with Property Boundary

3.9.1 Environmental Consequences

3.9.1.1 No-Build Alternative

Under the No-Build Alternative, the improvements to the intersection of 20th Street South and 22nd Avenue South would not be constructed. There would be no further impacts on any of the identified Section 4(f) and 6(f) properties. Identified safety concerns for pedestrians and bicyclists using the trail would continue to impact the Allyn Frerichs Trail.

3.9.1.2 Revised Build Alternative

Edgebrook Golf Course

The Revised Build Alternative would require permanent ROW transfer from the Edgebrook Golf Course. A permanent acquisition would be needed to complete the construction of the Revised Build Alternative along the southeast east corner of the golf course at the intersection of 20th Street South and 22nd Avenue South. Operations of the golf course would not be impacted. A total of 0.19 acre (8,396 square feet) within the golf course property would be permanently impacted and 0.26 acre of temporary easement would be required for construction. The permanently impacted areas are considered a conversion of use of the 6(f) property. The temporary impact area would be grading and reseeded to a similar or better condition once the construction of the area is complete.

Section 6(f) requires that all funded lands be retained and used solely for the purposes of outdoor recreation in perpetuity. Section 6(f) also notes LWCF-funded property converted to non-recreational purposes must have the approval of the NPS. A conversion can be approved by the NPS only if there is a substitution for other recreational properties of at least equal fair market value and of reasonably equivalent usefulness and location. Each state has an identified state agency that is also responsible for compliance and enforcement of Section 6(f); within South Dakota this is SDGFP.

Meetings were held on June 28, 2024, and February 6, 2025, with the SDGFP Grants Manager to discuss the Revised Build Alternative and needed conversion area. The SDGFP Grants Manager then coordinated with the NPS. As part of the early coordination for Section 6(f), a boundary of the Section 6(f) property is identified and for this Project is the parcel boundary of the Edgebrook Golf Course (Appendix C and Figure 3-5). This boundary was utilized to calculate the permanent area needed of 0.19-acre, which was coordinated with SDGFP and Brookings Parks, Recreation, and Forestry Department (Figure 3-6). With the location of the property directly adjacent to the intersection, avoidance of the area is not possible to improve the turning radii.

Due to the unavoidable impact, the NPS determined that the Revised Alternative would result in a Conversion of Use. To mitigate for the Conversion of Use, replacement land was considered and identified to be a 0.54-acre (23,629 square foot) area in the southeast portion of the golf course north of 20th Street South (Figure 3-6). The proposed replacement property is directly adjacent to the golf course and is currently owned by SDDOT. Golf carts currently encroach into the proposed mitigation area and a path was previously built outside the golf course property and purchased by SDDOT as part of the I-29 20th Street South interchange project. The transfer would immediately provide beneficial uses for the Edgebrook Golf Course to preserve this path for Edgebrook Golf Course users.

The mitigation area was part of the 2020 EA Study Area, and the conditions of the area are the same as when considered during the EA process. Refer to Appendix B, 2020 EA Coordination for the following coordination was completed, which included the mitigation area. The following information can be utilized by NPS for their NEPA requirements:

- A wetland delineation was completed for the 2020 EA, and no wetlands or other waters of the US are present within the mitigation area.

- A Northern Long Eared Bat Survey was completed, habitat was present adjacent to the mitigation area within the golf course, and tree removal occurred for the construction of the interchange

and was coordinated during the 2020 EA. An effect determination of may affect, not likely to adversely affect was recommended and USFWS concurred. For this SEA action, the mitigation area would be a conversion of property, no tree removal would occur. No effect would occur to the species from the conversion of the SDDOT ROW to golf property.

- Tribal coordination letters were sent out. Lower Brule Tribe responded no comment.

- Coordination occurred with SDGFP and SDDANR, no construction would occur in this area. The mitigation area would be converted from SDDOT ROW to golf course property, no commitments noted are applicable.

- A cultural resources survey and report, A Level III Cultural Resources Survey of the Proposed Interstate 29 Interchange at 20th Street South, Brookings, Brookings County, South Dakota was completed. SHPO concurred with a No Historic Properties Affected determination.

As part of the Conversion of Use process under Section 6(f), an appraisal of the impacted and mitigation areas was completed on April 3, 2025, as part of the Section 6(f) conversion requirements. A Compliance and Stewardship Form was completed and provided to SDGFP for their coordination with NPS on April 7, 2025. A draft SEA was provided for the NPS to utilize to complete their NEPA requirement. The NPS responded on May 19, 2025, and noted the following. Refer to Appendix C for their full response.

- As far as the Section 6(f) conversion is concerned, it is acceptable if the Project moves into construction before the conversion is approved.

- The NPS will be adopting the NEPA completed by the FHWA through this SEA. Additional coordination occurred to provide the previous tribal coordination for NPS to adopt as well, for both the conversion and mitigation areas.

- The NPS does not see any concerns with the mitigation area and LWCF conversion.

The next step is for SDDOT and Brookings to continue coordination with the SDGFP Section 6(f) Liaison and provide any additional information requested, until the NPS has approved the Conversion of Use. SDDOT and Brookings will then coordinate the transfer of the mitigation area to become part of the Edgebrook Golf Course.

Allyn Frerichs Trail

The widening in the northeast corner of the intersection of 20th Street South and 22nd Avenue South would require reconstruction of a small segment of the Allyn Frerichs Trail (Figure 3-7). The proposed improvements would be minor and shorter in duration than the construction for the added turn lanes on 20th Street South and 22nd Avenue South. The Revised Build Alternative would require the crossing of Allyn Frerichs Trail on the northeast and southeast side of the intersection to be reconstructed. On the northeast side, the grade would be improved. On the southeast side, permanent ROW would be purchased from the adjacent private landowner to accommodate shifting of the trail adjacent to the expanded corner radius. The Revised Build Alternative is not anticipated to impede or cause any impacts to construction or use of the future trail segment.

During construction, a temporary detour of the Allyn Frerichs Trail would be required. The detour would utilize the existing sidewalk. Sheet 19 of the construction plans provides a detour layout for the temporary closure

of the Allyn Frerichs Trail (Appendix D). The detour is also shown on Figure 3-4. Signage would be provided to direct users around the construction.

In accordance with 23 CFR 774.3, the proposed project is anticipated to have a *de minimis* impact to Edgebrook Golf Course and Allyn Frerichs Trail, based upon the following assessment:

- All possible planning to minimize harm has been incorporated into project development.
- The nature and magnitude of changes would not adversely affect the recreational activities, features, or attributes that qualified the property for 4(f) protection.
- Proposed measures to minimize harm and resulting mitigation, regarding protecting the 4(f) property and maintaining access and safety, are reasonable and acceptable.

Based on the scope of the proposed project and type of work for the Revised Build Alternative, there would be no adverse effects to the protected recreational activities, features, or attributes associated with Edgebrook Golf Course and Allyn Frerichs Trail under Section 4(f) consideration. A *de minimis* impact is anticipated for each of the Section 4(f) properties. The Brookings Parks, Recreation, and Forestry Department is the official with jurisdiction (OWJ) under Section 4(f) for all the properties. The Project was consulted with the OWJ on July 30, 2024. A public notice will be posted in the Brookings Register to solicit public comment for the SEA and Section 4(f) uses. After being informed of the public comments and FHWA's intent to make the *de minimis* impact finding, a concurrence from the OWJ would be requested for the *de minimis* impact of the Allyn Frerichs Trail and Edgebrook Golf Course.

3.9.2 Mitigation Measures and Commitments

In accordance with Section 4(f), the Revised Build Alternative is anticipated to have a *de minimis* impact to the Allyn Frerichs Trail and Edgebrook Golf Course based upon the following measures to minimize harm. Brookings and SDDOT will incorporate the following during final design and construction:

- Access to the Allyn Frerichs Trail would be restricted for a period that is anticipated to be less than the time needed for construction.
- A detour would be provided due to the temporary closure of the Allyn Frerichs Trail. Sheet 19 of the construction plans provides a detour layout for the temporary closure of the Allyn Frerichs Trail. The detour is also shown on Figure 3-4. Signage would be provided to direct users around the construction.
- Temporary construction fencing would be installed along proposed construction limits near the Allyn Frerichs Trail.
- Appropriate signage would be installed to alert users of the Allyn Frerichs Trail of construction activities, access restrictions or closures, and to direct users to secondary access points.
- The staging and/or storage of construction equipment or materials would not take place outside proposed construction limits that are within the defined boundaries of the 4(f) property.

- The Contractor would be required to closely coordinate the construction schedule with SDDOT Environmental Manager (605.773.3721) and Brookings Parks, Recreation, and Forestry Director (605.692.2708) at the preconstruction meeting.

For the Section 6(f), conversion of use process, the Brookings and SDDOT will provide any additional information requested from NPS as the agency reviews the Compliance and Stewardship Form, including the appraisal. The Brookings and SDDOT will coordinate with SDGFP and NPS for approval of the conversion of use under Section 6(f). Mitigation for the Section 6(f) process is the 0.54-acre area identified directly adjacent to the Edgebrook Golf Course as shown in Figure 3-6.

The following are the commitments for Section 6(f) to be incorporated into construction:

- SDDOT will install temporary construction fencing along proposed construction limits near the Allyn Frerichs Trail and Edgebrook Golf Course.

- Access to the Edgebrook Golf Course will not be impacted.

- Appropriate signage would be installed to alert users of the Allyn Frerichs Trail and the Edgebrook Golf Course of construction activities, access restrictions or closures, and to direct users to secondary access points prior to the start of construction activities to protect the existing 6(f) property and the public.

- The staging and/or storage of construction equipment or materials would not take place outside proposed construction limits that are within the defined boundaries of the 6(f) property.

- The Contractor would be required to closely coordinate the construction schedule with SDDOT Environmental Manager (605.773.3721) and Brookings Parks, Recreation, and Forestry Director (605.692.2708) prior to the start of construction activities.

- Revegetation and landscaping within the temporary grading area within the Edgebrook Golf Course would occur.

In addition, SDDOT is responsible for completing the Conversion of Use and receiving NPS approval. SDDOT will transfer the identified Section 6(f) mitigation area to Brookings Park, Recreation, and Forestry Director after the approval of the Conversion of Use from the NPS.

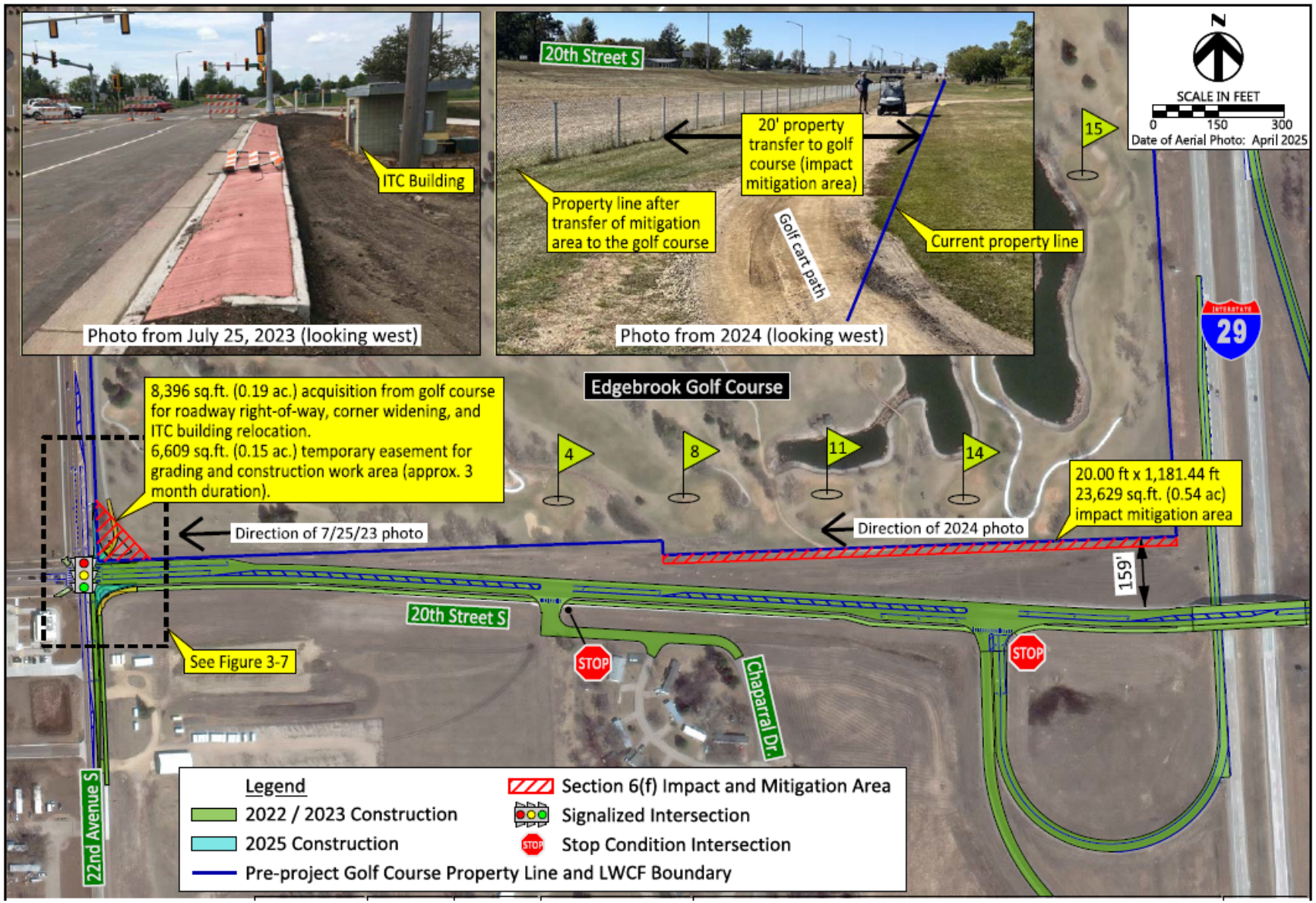


Figure 3-6. Section 6(f) Area Impacted and Proposed Mitigation Area

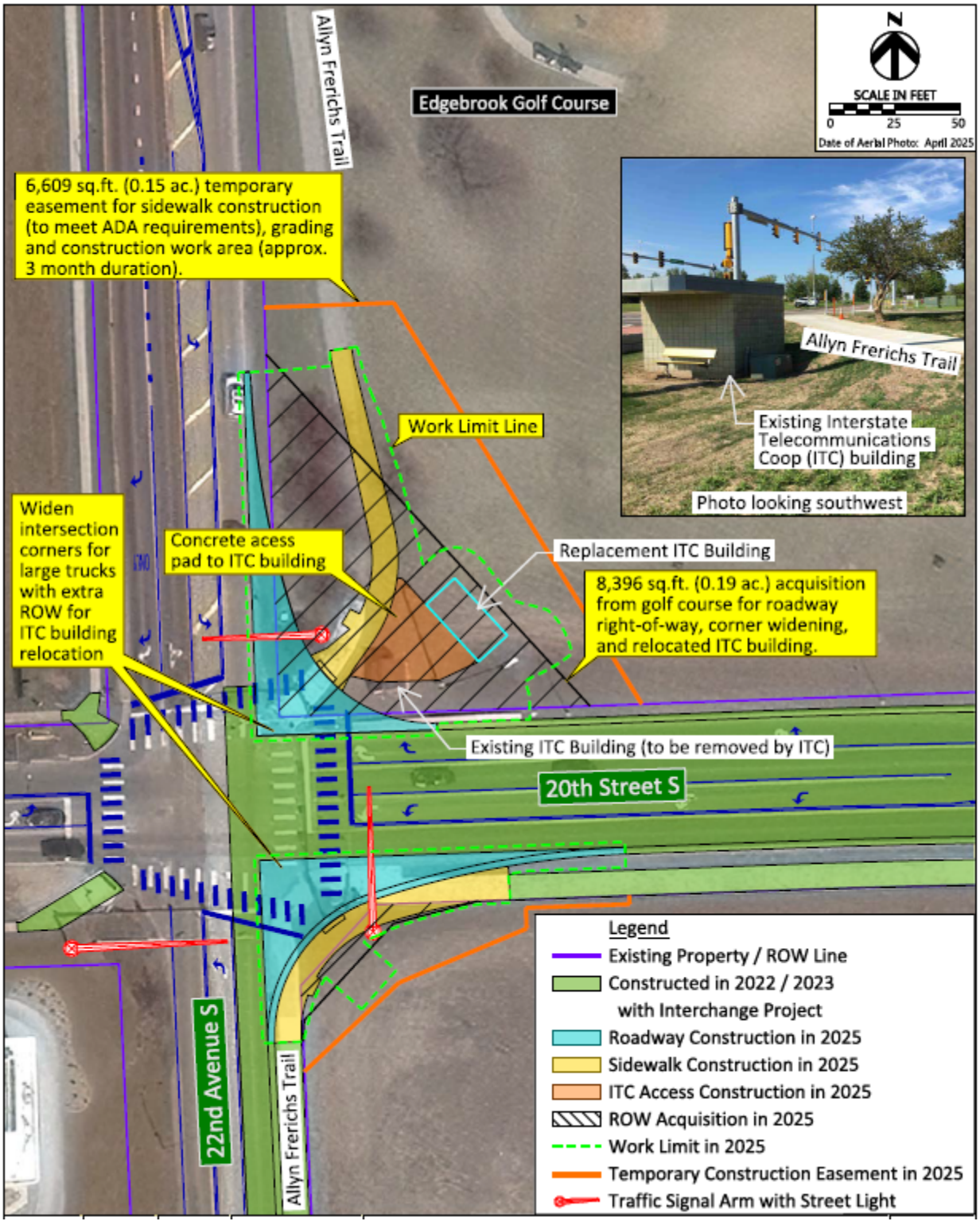


Figure 3-7. ITC Building, Golf Course, and Trail at the 20th St South and 22nd Ave Intersection

3.10 UTILITIES

The following utilities are within the working limits of the Revised Build Alternative:

- **Electrical:** Brookings Municipal Utilities owns an underground electric line under 22nd Avenue South and light poles along 20th Street South and 22nd Avenue South. One light pole will be relocated for the Project. The relocated light pole does not exceed the Federal Aviation Administration (FAA) height limitations.

- **Water:** The Brookings Municipal Utilities Water Department provides Brookings with potable water. Brookings receives its water supply from underground aquifers. A well within the Big Sioux Aquifer, located 2 miles northeast of Brookings, supplies water to the Brookings Municipal Utilities Water Department. A water main runs along the north side of 20th Street South and crosses 22nd Avenue South within the intersection.

- **Sewer:** Wastewater is diverted to the Brookings Wastewater Treatment Plant and flows south along 22nd Avenue South and 34th Avenue South, crossing 20th Street South.

- **Fiber:** Fiber lines for internet are provided through Swiftel Communications, SDN Communications, ITC), and several lines are in the Study Area.

- **ITC Building**: There is an existing ITC building in the northeast quadrant of the 20th Street South / 22nd Avenue South intersection that serves as a hub for several underground communication lines.

3.10.1 Environmental Consequences

3.10.1.1 No-Build Alternative

The No-Build Alternative would not involve Project construction and therefore would not result in temporary or permanent impacts on utilities.

3.10.1.2 Revised Build Alternative

The Revised Build Alternative would have temporary impacts due to the relocation of private and public utilities in the Study Area before or during construction. To minimize potential utility impacts caused by the proposed Project, close coordination occurred with utility companies and Brookings. Coordination would continue throughout final design and into construction of the Revised Build Alternative. The ITC building would be relocated to allow for the expansion of the intersection corner (Figure 3-7). The work would be completed by ITC. SDDOT, Brookings, and ITC are executing a utility agreement in accordance with SDDOT policy to cover the cost of building relocation because ITC has an easement that was executed prior to development of the golf course. Figures 3-6 and 3-7 show photos of the existing ITC building. Intersection expansion cannot take place without removing the existing building as indicated in Figure 3-7. The replacement building would be within the ROW area obtained from the golf course for the east side intersection expansion. Removal of the existing ITC building and construction of the replacement building will take place during the intersection expansion project. Coordination between the roadway contractor and the ITC contractor is called for in the intersection expansion plans.

3.10.2 Mitigation Measures and Commitments

Coordination with utility private utility companies the Brookings Municipal Utilities has been completed. SDDOT, the City of Brookings, and ITC are executing a utility agreement for work associated with the removal of the existing ITC building and a replacement building to be constructed by ITC while intersection expansion construction is occurring. The existing and replacement ITC buildings are within the ROW acquisition/impact area of the golf course; mitigation of the Section 6(f) 8,396 square foot impact area is accomplished with a 23,629 square foot parcel approximately 1,500 feet east of the 20th Street South and 22nd Avenue South intersection along the south side of Edgebrook Golf Course.

4.0 SUMMARY OF IMPACTS, MITIGATION AND COMMITMENTS

Table 4-1 summarizes the anticipated permitting and approvals. Table 4-2 summaries the environmental impacts associated with No-Build Alternative and Revised Build Alternative. Table 4-3 summarizes the mitigation measures for the Revised Build Alternative. Appendix D includes a draft Section A that would be included within the final design and plan sheets for construction.

Table 4-1. Anticipated Permitting and Approvals

Permit or Approval Name/Type	Permit/Approval Description	Issuing Agency	Permit/Approval Requirements
Section 4(f) *De Minimis* OWJ Concurrence	A *de minimus* impact of 4(f) property.	Brookings (OWJ)	Brookings was determined to be the OWJ for the Edgebrook Golf Course and Allyn Frerich Trail. Concurrence with the *de minimus* impact of the properties for the project are required and will be requested after public availability of this SEA. Minimization measures discussed with Brookings would be used to minimize impacts to the golf course and Allyn Frerich Trail.
Section 6(f) Conversion of Use Approval	Conversion of 6(f) property from specified recreation use to another use.	NPS	A Conversion of Use approval from NPS is required for the project due to use of portion of the 6(f) properties switching from recreation to transportation. Mitigation measures discussed with NPS and SDGFP would be used to satisfactorily replace the property to the Edgebrook Golf Course. SDDOT is responsible for completing the Conversion of Use and receiving NPS approval. SDDOT will transfer the identified Section 6(f) mitigation area to Brookings Park, Recreation, and Forestry Director after the approval of the Conversion of Use from the NPS.

Table 4-2: Impact Summary of the No-Build Alternative and Revised Build Alternative

No-Build Alternative	Revised Build Alternative
Acquisitions and Relocations	
No acquisitions or relocations are required under the No-Build Alternative.	The Revised Build Alternative would require the **acquisition from four parcels for a total of approximately 0.58 acres.**
Pedestrians and Bicyclists	
The tight corners on the east side of the 20th Street South and 22nd Avenue South intersection have resulted in trucks damaging the pedestrian signal equipment. This will continue with the No-Build Alternative.	The Revised Build Alternative would improve the pedestrian and bicycle facilities. The Revised Build Alternative would create a widened turning radius, so trucks are much less likely to damage pedestrian signal equipment where the Allyn Frerichs Trail crosses 20th Street South. Therefore, the Revised Build Alternative would have a **moderate beneficial effect** on pedestrians and bicyclists.
Water Quality	
The No-Build Alternative would have **no effects** on water quality.	In coordination with SDDANR, they noted that the Project would not have any adverse environmental effects to drinking water and is unlikely to have adverse effects to groundwater quality The Revised Build Alternative would result in a **negligible to minor increase** in runoff from impervious surfaces due to the additional lanes.
Threatened and Endangered Species	
The No-Build Alternative would have **no effects** on listed and proposed threatened or endangered species.	The Revised Build Alternative would have **no effect** to listed and proposed threatened and endangered species.
Cultural Resources	
The No-Build Alternative would have an effect determination of **no historic properties affected**.	The Revised Build Alternative would have an effect determination of **no historic properties affected**.

No-Build Alternative	Revised Build Alternative
Section 4(f) and Section 6(f) Resources	
The No-Build Alternative would have **no effects** on Section 4(f) and Section 6(f) resources.	The proposed work within the golf course as part of the Revised Build Alternative is anticipated to be considered a **Conversion of Use** under Section 6(f). For Section 4(f) ***de minimis*** **impact** of the Allyn Frerichs Trail and Edgebrook Golf Course would occur.
Utilities	
The No-Build Alternative would have **no effects** on utilities.	The Revised Build Alternative would require relocation of the ITC building. Relocations of utilities would be necessary with the Revised Build Alternative. To minimize impacts, coordination has occurred with utility companies and Brookings. This coordination would continue prior to construction.

Table 4-3. Mitigation Measures Proposed for Revised Build Alternative

Environmental Commitment	Mitigation Measures
Acquisitions and Relocations	Acquisitions and relocations will be conducted in conformance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended by the Surface Transportation Assistance Act of 1987 and 49 CFR, Part 24, effective April 1989.
Pedestrians and Bicyclists	See commitments for Section 4(f) and 6(f).
Water Quality	Due to the relative area (0.37 acre), the SDDOT standard Stormwater Pollution Prevention Plan (SWPPP) is not necessary. However, specific erosion control plans are included in the construction plans in accordance with SDDOT guidelines. SDDOT Standard Commitments A (Water Source) and E (Stormwater) have been incorporated into the plans. The disturbed area (0.37 acre) does not reach the point of requiring a stormwater discharge permit. The plan notes state that construction dewatering will not be required due to the limited subsurface excavation.

Environmental Commitment	Mitigation Measures
Section 4(f) and 6(f) Resources	The following have been incorporated into Section A (Environmental Commitments) of the plans: <u>Allyn Frerichs Trail</u> Access to the Allyn Frerichs Trail would be restricted for a period that is anticipated to be less than the time needed for construction. Sheet 19 of the construction plans provides a detour layout for the temporary closure of the Allyn Frerichs Trail. The detour is also shown on Figure 3-4. Signage would be provided to direct users around the construction. The Contractor is not permitted to stage equipment or materials within the Allyn Frerichs Trail or the Edgebrook Golf Course. The land being used will be fully restored and returned to a condition which is at least as good as that which existed prior to the project. Revegetation and landscaping within the temporary grading areas will occur. The Contractor will notify the Project Engineer if additional easement is needed to complete the work adjacent to any Section 4(f) property. The Project Engineer will obtain an appropriate course of action from the Environmental Office before proceeding with construction activities that affect any Section 4(f) property. The Contractor would be required to closely coordinate the construction schedule with SDDOT Environmental Manager (605.773.3721) and Brookings Parks, Recreation, and Forestry Director (605.692.2708) at the preconstruction meeting. <u>Edgebrook Golf Course</u> The impacted area of the Edgebrook Golf Course in the northeast quadrant of the 20th Street South and 22nd Avenue South intersection is being mitigated by replacement property of equal or greater usefulness and value along the south edge of the golf course approximately 1,500 feet east of the intersection. The Contractor is not permitted to stage equipment or materials within the Edgebrook Golf Course. The Contractor will notify the Project Engineer if additional easement is needed to complete the work adjacent to any Section 6(f) property. The Project Engineer will obtain an appropriate course of action from the Environmental Office before proceeding with construction activities that affect any Section 6(f) property.

Environmental Commitment	Mitigation Measures
Utilities	Coordination with utility companies has been completed. SDDOT, the City of Brookings, and ITC are executing a utility agreement for work associated with the removal of the existing ITC building and a replacement building to be constructed by ITC while intersection expansion construction is occurring. The existing and replacement ITC buildings are within the ROW acquisition/impact area of the golf course; mitigation of the Section 6(f) 8,396 square foot impact area is accomplished with a 23,629 square foot parcel approximately 1,500 feet east of the 20th Street South and 22nd Avenue South intersection along the south side of Edgebrook Golf Course.

5.0 COORDINATION AND PUBLIC INVOLVEMENT

As indicated in the SEA and supporting documentation, SDDOT coordinated with Federal, State, and local agencies, and Tribes during the development of the SEA.

5.1 PUBLIC INVOLVEMENT

Brookings held a public meeting on April 9, 2025, to discuss the planned construction projects for 2025. The proposed turning radius improvements on the east side of the 20th Street South and 22nd Avenue South intersection was presented via a poster and discussed with attendees at the public meeting. No written comments were submitted regarding this Project.

5.2 AGENCY COORDINATION

Federal, State, and local agencies that were consulted regarding the Project include:

- National Parks Service
- United States Fish and Wildlife Service
- South Dakota State Historic Preservation Office
- South Dakota Department of Agriculture and Natural Resources
- South Dakota Department of Game, Fish and Parks
- Brookings Parks, Recreation, and Forestry Department

Appendix B of the SEA summarizes the agency and local government coordination relevant to the Project.

5.3 TRIBAL COORDINATION

Section 106 of the National Historic Preservation Act of 1966 guides federal agencies to consult tribes that are federally recognized and may have a cultural or religious association to historic resources affected by federal actions. For this Project, SDDOT sent coordination letters on November 4, 2024 and April 23, 2025, to the following tribes that may have an interest in the highway projects in Brookings County. No response was received.

- Bureau of Indian Affairs
- Flandreau Santee Sioux Tribe
- Rosebud Sioux Tribe
- Lower Brule Sioux Tribe
- Crow Creek Sioux Tribe
- Sisseton Wahpeton
- Three Affiliated Nations
- Chippewa Cree Tribe

5.4 FUTURE INVOLVEMENT

Public coordination will occur following the release of this SEA and Section 4(f) evaluation for public comment. Following the 30-day comment period, public and agency comments on the SEA would be summarized, and responses would be provided in the same way that comments on the EA were provided for. Additional actions or changes precipitated by the public or agency's comments but not presented in the SEA, would be specified. If further documentation is necessary, it would be accomplished by revising the SEA or preparing an Environmental Impact Statement, whichever is appropriate. Mitigation presented in the SEA would be committed to and completed by Brookings and SDDOT.

If the environmental review process finds that the Project will not result in any significant environmental impacts, SDDOT will prepare a request for an amended Finding of No Significant Impact (FONSI) and will submit the request to FHWA. SDDOT will also seek concurrence from the Brookings's Parks, Recreation, and Forestry Department for the proposed Section 4(f) determination. If FHWA agrees that an amended FONSI and the Section 4(f) determination is appropriate, it will issue an amended FONSI to conclude the environmental review process and document the decision. If FHWA determines that the Project would result in significant environmental impacts, SDDOT may prepare an Environmental Impact Statement or select the No-Build Alternative as its preferred alternative.

6.0 PREFERRED ALTERNATIVE

Based on the evaluation of potential impacts, the Revised Build Alternative is recommended as the preferred alternative. The Revised Build Alternative would address future traffic capacity issues at the intersection. The Revised Build Alternative would meet SDDOT design criteria for large truck-turning movements at the 20th Street South and 22nd Avenue South intersection, fulfilling the needs of the Project outlined in Section 1.4.2.

Although the drawbacks of the Revised Build Alternative include the permanent conversion of a property protected by Section 6(f), Edgebrook Golf Course, and the de minimis use of 4(f) properties, Edgebrook Golf Course and Allyn Frerichs Trail, the No-Build Alternative is not recommended as the preferred alternative because truck traffic would continue to have issues with the turning movement at this intersection, therefore hindering traffic flows through the area.

The preferred alternative avoids or minimizes impacts on environmental resources to the extent practicable. For those unavoidable impacts, mitigation measures are proposed. Due to meeting the Purpose and Need and considering the potential impacts, the Revised Build Alternative was identified as the preferred alternative. Refer to Figure 2-2.

7.0 SUPPLEMENTAL TECHNICAL REPORTS PREPARED FOR THIS SEA

The following technical reports were prepared for this SEA:

- Augustana Archeological Laboratory 2024. *Level III Cultural Resources Investigation for Proposed Supplemental EA for the I-29, Exit 130 Interchange in Brookings South Dakota*.
- HDR 2025. *20th Street S & 22nd Avenue Intersection Traffic Operations Update*.
- HDR 2025. *Wetland Delineation Memo for Brookings Interchange*.

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APPENDIX A: TRAFFIC STUDY UPDATE

Memo

Date:	Friday, January 17, 2025
Project:	20th Street S Interchange
To:	City of Brookings
From:	HDR
Subject:	20th Street S & 22nd Avenue Intersection Traffic Operations Update

Introduction

This memo updates the 20th Street South Corridor Year of Need Analysis within the I-29 20th Street South Interchange Justification Report (IJR) completed in September 2020. Recommendations for intersection turn lane configurations, geometrics, and traffic control are provided for Year 2050 (Planning Horizon) Build condition traffic volumes.

The analysis updates traffic forecasts for Year 2050 to include revised growth rates and trip generation based on current development trends. Existing condition traffic patterns, which provide the foundation for traffic forecasting, were also updated using intersection turning movement counts collected in spring/summer 2024 following opening of the I-29 Exit 130 (20th Street S) interchange.

Data Collection

Peak period intersection turning movement counts were collected on typical weekdays in the months of April, May, and June 2024 at the following intersections:

- 20th Street S & 22nd Avenue (April 2024 when SDSU was still in session)
- 20th Street S & I-29 southbound ramp terminal (May 2024)
- 20th Street S & I-29 northbound ramp terminal (May 2024)
- 20th Street S & 34th Avenue (May 2024)
- 20th Street S & Ace Avenue (June 2024)

Twenty-four hours of counts were processed for the two 20th Street S and I-29 ramp terminal intersections to establish daily volumes.

Seasonal factors and growth factors for study area streets were provided by the South Dakota Department of Transportation (SDDOT).

Existing Volumes

Peak hours were well-defined within the traffic counts and generally reflect:

- AM peak hour: 7:15 – 8: 15 a.m.
- PM Peak hour: 4:30 – 5:30 p.m.

Peak hour volumes specific to each respective intersection were used to develop the existing condition volume set shown in **Figure 1**. These volumes may vary +/- 15 minutes from the corridor peak hour. Volumes were smoothed and balanced across intersections where feasible. Existing 20th Street S volumes do not balance between Ace Avenue and 22nd Avenue due to uncounted, high-volume mid-segment driveways. Heavy vehicle percentages are based on the 2024 intersection turning movement counts.

Traffic Forecasts

The development of traffic forecasts used the following process:

1. **Develop 'Existing' condition volumes**
    a. Based on spring/summer 2024 intersection turning movement counts
2. **Determine traffic growth factor between years 2024 to 2050**
    a. Based on review of SDDOT-derived growth factors
    b. Reflects general traffic growth passing through the study area
3. **Develop Year 2050 'Background' traffic volumes**
    a. 'Background' traffic volumes = Existing traffic x growth factor identified in Step 2
    b. Adjusted intersection volumes using NCHRP 765 'Iterative Procedure – Directional Method' to create the 'Background' traffic volume set
4. **Develop 'Development' generated traffic volumes**
    a. Met with City of Brookings to discuss potential development along the 20th Street S and 22nd Avenue corridors within the study area
    b. City of Brookings provided available site plans and traffic impact studies
    c. For development west of I-29:
        i. Estimated trip generation using ITE Trip Generation Manual, 11th Edition, trip generation rates
    d. For development east of I-29:
        i. Refined trip generation estimates documented in the I-29 20th Street S IJR's Traffic Forecasting Process Summary memo
    e. Assigned trip generation volumes to the study area street network based on location of development, access points, existing traffic patterns, and proximity to I-29 and the Brookings core areas to create the 'Development' traffic volume set
5. **Develop Year 2050 AM, PM, and Daily traffic volumes**
    a. Combine volumes developed in Steps 3 and 4
    b. Adjusted volumes to align with target 'K' factors
    c. Balanced and smoothed volumes to create the Year 2050 traffic volume set

Year 2050 AM, PM, and Daily traffic volumes are provided in **Figure 2**.

EXISTING (2024) TRAFFIC VOLUMES

FIGURE 1

2050 PLANNING HORIZON TRAFFIC VOLUMES

FIGURE 2

BROOKINGS, SD | 20TH STREET S & 22ND AVENUE INTERSECTION TRAFFIC OPERATIONS UPDATE

Development Trip Generation

Trip generation estimates for developable/redevelopable areas west of I-29 are shown in **Table 1**, correlating to areas identified in **Figure 3**. A 10 percent reduction was applied for internal capture to account for trips that begin and end within a development area.

The identified development in this area west of I-29 is expected to generate upwards of 14,000 trips per day. However, it should be noted that pass-by trips (traffic that is already on the corridor that would access the development as part of their typical route) account for nearly half of this development's generated trips. These types of trips do not increase traffic on the arterial street network.

Table 1: Trip Generation for Development West of I-29

Area	#	Land Use	Total Daily Trips	AM				PM			
				In	Out	Pass-By	Total	In	Out	Pass-By	Total
NW	1	C-Store / Gas Station	3,240	68	68	205	341	57	57	173	287
NW	2	Strip Retail Plaza	1,868	33	22	38	93	78	78	104	260
SW	3	C-Store / Gas Station	3,703	78	78	234	390	66	66	196	328
SW	4	Coffee Shop w/DT & Inside Seating	768	6	6	112	124	3	3	50	56
SW	5	Strip Retail Plaza	881	14	9	14	37	32	32	41	105
SE	6	Strip Retail Plaza	2,580	47	32	54	133	112	112	148	372
SE	7	Office	854	105	14	0	119	19	94	0	113
		Totals:	*13,894*	*351*	*229*	*657*	*1,237*	*367*	*442*	*712*	*1,521*

Trips account for 10% reduction for internal capture

Trip generation estimates for developable areas east of I-29 are shown in **Table 2** and correlate to areas identified in **Figure 3**. Since future development is less defined in this area, a 15% internal capture reduction was applied to the mixed-use development area and pass-by trips were not estimated.

Table 2: Trip Generation for Development East of I-29

Area	#	Land Use	Total Daily Trips	AM				PM			
				In	Out	Pass-By	Total	In	Out	Pass-By	Total
E	48	Office Park	3,320	410	40	0	450	80	410	0	490
E	60	Mixed Use (Office, Retail, Apartments, SF Homes)	8,270	640	430	0	1,070	220	490	0	710
		Totals:	*11,590*	*1,050*	*470*	*0*	*1,520*	*300*	*900*	*0*	*1,200*

Mixed-use development trips account for 15% reduction for internal capture

It should be noted that not all generated trips will access the study area street network. In many instances, these developments will include access points to other surrounding streets with connectivity outside of this study area.

0 500 Feet

TRIP GENERATION DEVELOPMENT AREAS

FIGURE 3

Traffic Operations Analysis

Methodology

The traffic operations analysis follows methodology in the Highway Capacity Manual, 7th Edition (HCM7). A Level of Service (LOS) goal of 'C' was used to identify recommended intersection lane configuration and/or traffic control modifications beyond what is currently installed.

The traffic operations analysis was conducted using Synchro/SimTraffic version 12. Analysis measures were reported from Synchro's HCM7 module and SimTraffic. HCM7 methodology recommends right turn on red (RTOR) be zero unless field measured. SimTraffic simulation was used to provide an alternate analysis where RTOR was estimated and incorporated into the operational results.

Analyzed Lane Configurations and Traffic Control

Analyzed lane configurations and traffic control are shown in **Figure 4**. The recommended 2050 Build condition intersection lane configurations and traffic control reflect the following modifications to the existing conditions:

20TH STREET S & 22ND AVENUE INTERSECTION

- Add southbound through lane
  - SB approach: LT, T, T, RT
- Add northbound through lane
  - NB approach: LT, T, T/RT
- Add eastbound right turn lane
  - EB approach: LT, T, RT

I-29 NORTHBOUND AND SOUTHBOUND RAMP TERMINAL INTERSECTIONS

- Signalize both intersections

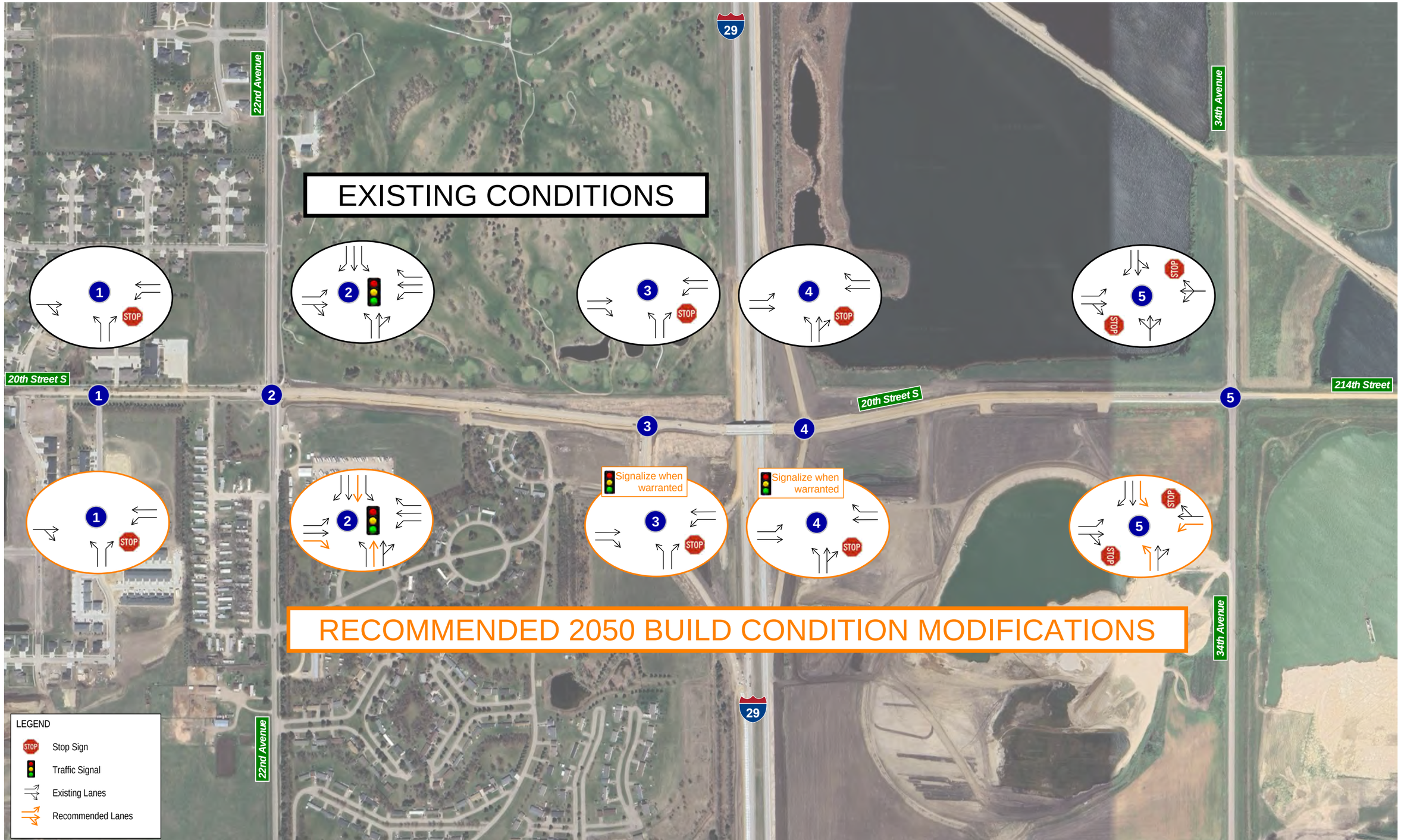
20TH STREET S & 34TH AVENUE

- Add westbound left turn lane
  - WB approach: LT, T/RT
- Add southbound and northbound left turn lanes
  - SB approach: LT, T, RT
  - NB approach: LT, T/RT

Traffic Analysis Output Reports

Traffic analysis output reports are provided in the Appendix as follows:

- **Appendix A:** Existing and 2050 Build condition intersection operations analysis reports for results presented in Table 3 and **Table 4**
- **Appendix B:** I-29 ramp terminal intersection year of need analysis reports
- **Appendix C:** 20th Street S & 22nd Avenue year of need analysis reports
- **Appendix D:** 20th Street S & 34th Avenue year of need analysis reports



LANE CONFIGURATIONS AND TRAFFIC CONTROL

FIGURE 4

Intersection Operations Analysis

A summary of intersection operations for the Existing and 2050 Build conditions is provided in **Table 3** and **Table 4** for HCM7 and SimTraffic output, respectively.

Table 3: Intersection Operations (HCM7)

20th Street S Intersection	**Existing (2024)**			**2050 Build Condition**		
	Intersection Control	**AM** *LOS / Delay*	**PM** *LOS / Delay*	Intersection Control	**AM** *LOS / Delay*	**PM** *LOS / Delay*
Ace Ave	TWSC	A / 0.8 *(B / 11.2)*	A / 0.9 *(B / 11.2)*	TWSC	A / 1.3 *(C / 17.0)*	A / 1.4 *(C / 17.4)*
22nd Ave	Signal	B / 16.7	B / 17.6	Signal	C / 31.9	C / 28.8
I-29 SB RTI	TWSC	A / 1.5 *(B / 11.2)*	A / 2.9 *(B / 12.2)*	Signal	A / 6.4	A / 9.5
I-29 NB RTI	TWSC	A / 6.7 *(B / 13.5)*	A / 6.3 *(B / 12.2)*	Signal	B / 10.4	B / 15.5
34th Ave	TWSC	A / 5.8 *(A / 9.6)*	A / 2.7 *(A / 9.3)*	TWSC	E / 44.5 *(F / 100.6)*	B / 13.8 *(D / 31.1)*

RTOR assumed zero

Overall intersection delay in terms of seconds of delay/vehicle; Worst-case stop-control approach also shown *(LOS / Delay)*

Table 4: Intersection Operations (SimTraffic)

20th Street S Intersection	**Existing (2024)**			**2050 Build Condition**		
	Intersection Control	**AM** *LOS / Delay*	**PM** *LOS / Delay*	Intersection Control	**AM** *LOS / Delay*	**PM** *LOS / Delay*
Ace Ave	TWSC	A / 1.0 *(A / 5.3)*	A / 0.8 *(A / 5.5)*	TWSC	A / 3.1 *(B / 14.3)*	A / 2.0 *(C / 14.1)*
22nd Ave	Signal	B / 12.3	B / 12.2	Signal	C / 28.5	C / 27.9
I-29 SB RTI	TWSC	A / 1.6 *(A / 6.2)*	A / 2.3 *(A / 7.2)*	Signal	A / 8.9	B / 11.3
I-29 NB RTI	TWSC	A / 2.9 *(A / 6.0)*	A / 2.8 *(A / 5.8)*	Signal	B / 13.1	B / 15.1
34th Ave	TWSC	A / 0.8 *(A / 4.9)*	A / 1.4 *(A / 4.5)*	TWSC	A / 8.8 *(C / 14.7)*	A / 6.6 *(D / 13.0)*

RTOR incorporated through SimTraffic simulation

Overall intersection delay in terms of seconds of delay/vehicle; Worst-case stop-control approach also shown *(LOS / Delay)*

Key findings from the intersection operations analysis include:

20TH STREET S & 22ND AVENUE INTERSECTION

- Permitted U-turn movements with right turn on red (RTOR)
    - Permitted U-turn movements within the 20th Street S & 22nd Avenue intersection may limit opportunities for RTOR and right turn overlap signal phasing
        - Example includes the potential need for a southbound to northbound U-turn, where an upstream right-in right-out at the gas station access (northwest quadrant) may lead to downstream U-turn movements
    - As U-turn demand grows, intersection operations will shift from the SimTraffic measures (RTOR permitted) to the HCM7 measures (RTOR assumed 0)
    - If a westbound right turn overlap (with a left turn phase) is not provided due to conflicting U-turn movements, overall intersection operations are expected to degrade to LOS D
    - Include U Turn Yield to Right Turn sign (MUTCD R10-16) to help manage conflict for these movements
- Westbound through movement 95th percentile queue exceeds 725 feet in the Year 2050 PM peak hour
    - Reflects a rolling queue between 22nd avenue and I-29 Exit 130 southbound ramp terminal intersection due to high commuter traffic flow traveling back to residential areas west of 22nd Avenue
        - Several different sources of traffic (e.g., development traffic adjacent to 20th Street S and 34th Avenue, interchange traffic from I-29) contribute to the continuous westbound flow arriving at the intersection
    - Traffic signal coordination with future I-29 Exit 130 interchange traffic signals (when warranted) provides some benefit, but a portion of the continuous flow of westbound through traffic will still be required to stop at 22nd Avenue
    - A second westbound through lane would provide a benefit to westbound, and overall intersection, queue lengths and delay. Additional lanes on 20th Street S should be explored through future planning studies.

20TH STREET S & I-29 NORTHBOUND AND SOUTHBOUND RAMP TERMINAL INTERSECTIONS

- Signalizing the existing ramp terminal intersections address 2050 operational needs

20TH STREET S & 34TH AVENUE INTERSECTION

- Elevated delay for eastbound left turn movement in AM peak hour (HCM7 analysis only)
    - High-volume commute route movement
- Key contributors to this condition include the following, which collectively lead to fewer gaps in 34th Avenue traffic and higher levels of eastbound/westbound delay:
    - Development along 34th Avenue, which increases northbound/southbound traffic traveling through the intersection
    - Development east of I-29, north of 20th Street S, which increases eastbound left turn traffic demand
    - Paving 214th Street east to Aurora, which draws additional traffic to the corridor originating from/destined to areas east of 34th Avenue

I-29 Ramp Terminal Intersections: Traffic Signal Year of Need

Traffic signal year of need analyses were conducted for the two I-29 Exit 130 interchange ramp terminal intersections using the following methods:

- **Traffic signal warrants**: planning-level review of traffic signal warrants to identify when traffic volumes may exceed traffic signal volume-warrant thresholds
- **Stop-controlled approach LOS D:** traffic operations analysis to identify when traffic volumes may result in stop-controlled approach LOS D

As development will be the primary generator of new traffic on 20th Street S and the interchange approaches, the pace and density of future development will play a key role in planning-level timelines. For this analysis, straight-line growth between 2024 and 2050 was assumed.

Traffic Signal Warrants (MUTCD Warrant 1 and 2)

A planning-level review of traffic signal warrants was conducted using guidance provided in the Manual on Uniform Traffic Control Devices (MUTCD). Warrant 1 (8-hour) and Warrant 2 (4-hour) were reviewed by applying peak hour growth factors (between Years 2024 and 2050) to 15-minute count intervals within the 24-hour traffic count spreadsheets. Growth factors were determined for each intersection movement.

Both ramp terminal intersections were analyzed using a single through lane in each direction on 20th Street S. For the off-ramp approach, only the northbound left turn movement traffic volumes were analyzed. It is anticipated that northbound right turn volumes will be able to enter 20th Street S with minimal delay well into the future.

Findings from the planning-level warrant analysis include:

20TH STREET S & I-29 SOUTHBOUND RAMP TERMINAL

- 4-hour warrant met between 2045 and 2050

20TH STREET S & I-29 NORTHBOUND RAMP TERMINAL

- 4-hour warrant met between 2040 and 2045

Stop-Controlled Approach LOS D

A traffic operations analysis was also conducted to identify the approximate volumes and associated timeframe for when the off-ramp approach would reach LOS D. The analysis also identified when the northbound off-ramp left turn movement reaches LOS D. Level of Service measures were obtained from HCM7 output in Synchro.

Findings from the planning-level LOS D analysis include:

20TH STREET S & I-29 SOUTHBOUND RAMP TERMINAL

- AM Peak Hour
  - Off-ramp approach LOS D between 2045 and 2050
  - Off-ramp left turn LOS D movement between 2040 and 2045
- PM Peak Hour
  - Off-ramp approach LOS D between 2035 and 2040
  - Off-ramp left turn LOS D movement between 2035 and 2040

20TH STREET S & I-29 NORTHBOUND RAMP TERMINAL

- AM Peak Hour
  - Off-ramp approach LOS D between 2035 and 2040
  - Off-ramp left turn LOS D movement between 2030 and 2035
- PM Peak Hour
  - Off-ramp approach LOS D between 2035 and 2040
  - Off-ramp left turn LOS D movement between 2035 and 2040

20th Street S & 22nd Avenue Intersection: Intersection Build-Out Year of Need

The 20th Street S & 22nd Avenue intersection existing configuration was analyzed to determine when full built-out may be required. Similar to the ramp terminal intersections, straight-line growth between 2024 and 2050 was assumed. The following summarizes the approximate timeframes for when the intersection transitions from LOS C to LOS D:

- AM peak hour: 2040 (LOS C) – 2045 (LOS D)
- PM peak hour: 2045 (LOS C) – 2050 (LOS D)

Overall, there appears to be capacity within the existing intersection configuration to accommodate several years of traffic growth. Generally, the high volume conflicting movements generating these LOS C to LOS D transitions include eastbound through and left turn movements, southbound left turn and right turn movements, and westbound through and right turn movements.

20th Street S & 22nd Avenue Intersection 95th Percentile Queues

Table 5 summarizes Year 2050 Build condition 95th percentile queues for the 20th Street S & 22nd Avenue intersection obtained from SimTraffic output for use in future intersection design geometrics.

As previously discussed, the westbound queue is expected to reflect a rolling queue extending upstream of the intersection upwards of 725 feet (95th percentile) in the PM peak hour. However, the average queue is measured at 333 feet, which reflects that this queue is well managed for most of the PM peak hour though there may be a short period with the longer condition.

Table 5: 20th Street S & 22nd Avenue 95% Queues (2050 Build Condition, SimTraffic)

Intersection Movement	AM (ft)	PM (ft)
Eastbound Left Turn	**207**	154
Eastbound Through	**307**	153
Eastbound Right Turn	**110**	40
Westbound Left Turn	141	**248**
Westbound Through	318	**725**
Westbound Right Turn	180	**329**
Northbound Left Turn	61	**80**
Northbound Through/Right Turn	**134**	110
Southbound Left Turn	**221**	206
Southbound Through	**258**	231
Southbound Right Turn	36	**174**

Longest queue between the two peak hours noted in **Bold Text**

20th Street S & 34th Avenue Intersection Build-Out Year of Need

An incremental build-out of the intersection was evaluated, first starting with SDDOT unsignalized intersection turn lane warrants[1] for the northbound and southbound left turn volumes. Using straight-line growth between 2024 and 2050 volumes, it was found that turn lanes were warranted in the following timeframes:

- Southbound left turn lane warranted between 2045 and 2050
- Northbound left turn lane warranted by 2030

The northbound left turn lane warrant is highly dependent on development south of 20th Street S and thus the year of need likely correlates with, and is due to, that future development's density and timeline. When a northbound left turn lane is constructed, the north leg should also be widened to include a southbound left turn lane for lane balance through the intersection.

The next step of the incremental build-out analysis analyzed overall intersection LOS. The eastbound left turn movement in the AM peak hour drives the poor LOS shown in **Table 3**. The operational year of need for overall intersection and eastbound approach LOS transitions in the AM peak hour are as follows:

- Overall intersection (AM peak hour): 2045 (LOS C) – 2050 (LOS E)
- Eastbound approach (AM peak hour): 2045 (LOS D) – 2050 (LOS F)

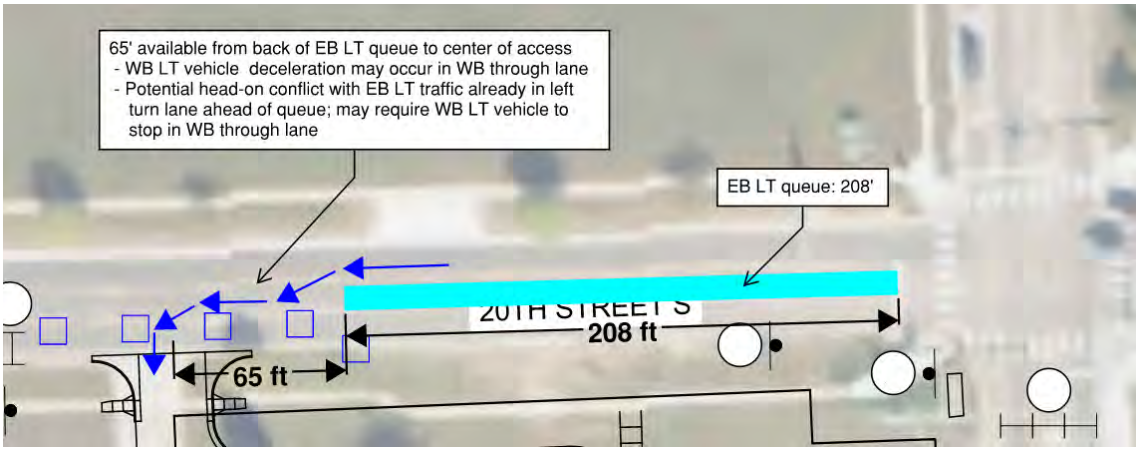
Traffic data was not collected at the 20th Street S & 34th Avenue for a full planning-level traffic signal warrant analysis, but it is anticipated volumes may approach warrant thresholds around the same time as the aforementioned intersection and approach LOS transition timeframes.

[1] SDDOT Road Design Manual, Chapter 15 Traffic, https://dotfiles.sd.gov/rd/rdmch15.pdf

Development Notes

Anecdotal notes associated with development traffic include:

- Right-in right-out access points immediately upstream of a signalized intersection may necessitate U-turn accommodations at that signalized intersection. This may adversely impact overall intersection operations by limiting opportunities for right turn overlap signal phasing and RTOR.
- Over time, traffic will gravitate towards routes and development access points with least delay, shortest travel time, easy turns (right turns in lieu of left turns), etc. Internal connectivity within and between developments is encouraged. Areas of note surrounding the 20th Street S & 22nd Avenue intersection include:
    - **Southeast quadrant:** northbound left turn traffic turning from (out of) the development to westbound 20th Street S may experience lengthy delays waiting for gaps in traffic, particularly during the PM peak hour.
    - **All quadrants:** 20th Street S & 22nd Avenue intersection queues are expected to grow considerably with future development.
        - Several planned developments expect high traffic volumes on adjacent arterial streets, as their proposed uses rely on pass-by type trips for a large portion of their customer traffic.
        - Development full access points should be monitored. When queues on the arterial streets extend through a development full access location and operations and safety are adversely impacted, the development access should be converted to RIRO or closed.
- Access points close to the 20th Street S & 22nd Avenue should be monitored for head-on conflict risk within center left turn lanes. As intersection queues grow, left turn queues may extend back to, or through, upstream access points. This leads to situations where opposing left turn traffic is unable to complete the lane change and then decelerate within the left turn lane without conflict of an opposing left turn vehicle.
    - See **Figure 5** for potential conflict overlap on 20th Street S, west of 22nd Avenue. See **Appendix E** for a sketch of potential turn lane dimensions at this location.



20th Street S & 22nd Avenue intersection, west leg. Site plan sheet modified for this figure.

Figure 5: Example of Potential Left Turn Conflict Overlap

Recommendations

The following recommendations for 20th Street S intersections are based on findings from this analysis. Recommended modifications to the existing intersections are noted in **Bold Orange** in the associated tables and **Figure 4**.

20th Street S & 22nd Avenue Intersection

Recommended lane configuration, intersection traffic control, and planning-level timelines for intersection build-out (recommended lane additions) for the 20th Street S & 22nd Avenue intersection are provided in **Table 6**.

Table 6: Recommended 2050 Build Condition Intersection (20th Street S & 22nd Avenue)

Approach	Lane Configuration	Intersection Control	Traffic Signal Year of Need	Intersection Build-Out Year of Need
EB	LT, T, **RT**	Traffic Signal (existing)	**Approximate year of warrant:** n/a	**Approximate year of LOS D:** 2040-2045 (AM) 2045-2050 (PM)
WB	LT, T, RT			
NB	LT, **T**, T/RT			
SB	LT, T, **T**, RT			

Modifications noted in **Bold Orange**

Where there may be conflict between U-turn and right turn traffic, it is recommended a U Turn Yield to Right Turn sign (MUTCD R10-16) be installed. This recommendation is applicable at other potential U-turn / right turn conflicts within the study area.

I-29 Exit 130 Interchange Ramp Terminal Intersections

Recommended lane configuration, intersection traffic control, and planning-level timelines for intersection build-out (traffic signals) for the southbound and northbound I-29 Exit 130 interchange ramp terminal intersections are provided in **Table 7** and **Table 8**, respectively.

Table 7: Recommended 2050 Build Condition Intersection (I-29 Exit 130 Interchange Southbound Ramp Terminal Intersection)

Approach	Lane Configuration	Intersection Control	Traffic Signal Year of Need	TWSC LOS Year of Need
EB	T, RT	TWSC (existing) **Traffic Signal (when warranted)**	**Approximate year of warrant:** 2045–2050	**Approximate year of off-ramp approach LOS D:** 2045–2050 (AM) 2035–2040 (PM) **Approximate year of NB LT LOS D:** 2040–2045 (AM) 2035–2040 (PM)
WB	LT, T			
NB	LT, RT stop-controlled approach			

Modifications noted in **Bold Orange**

Table 8: Recommended 2050 Build Condition Intersection (I-29 Exit 130 Interchange Northbound Ramp Terminal Intersection)

Approach	Lane Configuration	Intersection Control	Traffic Signal Year of Need	TWSC LOS Year of Need
EB	LT, T	TWSC (existing) **Traffic Signal (when warranted)**	**Approximate year of warrant:** 2040–2045	**Approximate year of off-ramp approach LOS D:** 2035–2040 (AM) 2035–2040 (PM) **Approximate year of NB LT LOS D:** 2030–2035 (AM) 2035–2040 (PM)
WB	T, RT			
NB	LT, T/RT stop-controlled approach			

Modifications noted in **Bold Orange**

20th Street S & 34th Avenue Intersection

Recommended lane configuration, intersection traffic control, and planning-level timelines for intersection build-out (recommended lane additions) for the 20th Street S & 34th Avenue intersection are provided in **Table 9**.

Timelines of needs at this intersection are highly dependent on development along 34th Avenue and paving of 214th Street east of 34th Avenue to Aurora. These conditions are likely more applicable to gauge timeline than the estimated year of need, which was based on straight-line growth assumptions. Therefore, the intersection should be analyzed in conjunction with any large future development along 34th Avenue (to review development-generated turn lane warrants) and/or paving of 214th Street east to Aurora to determine what improvements may be needed upon opening.

While not analyzed, a roundabout should be considered as an option if the intersection is fully reconstructed. Additional analysis should be conducted using updated traffic counts to gauge feasibility at that time.

Table 9: Recommended 2050 Build Condition Intersection (20th Street S & 34th Avenue)

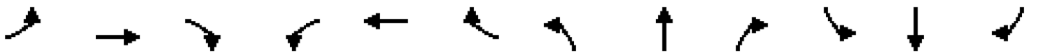
Approach	2050 Build Condition Lane Configuration	Intersection Control	Traffic Signal Year of Need	Intersection Build-Out Year of Need
EB	LT, T/RT	TWSC (existing) *Consider traffic signal or roundabout when intersection control needs to be modified.*	**Approximate year of warrant:** n/a	**Warranted turn lanes:** NB: by 2030 (PM) SB: 2045-2050 (PM) **Approximate year of LOS D:** 2045-2050 (AM)
WB	**LT**, T/RT			
NB	**LT**, T/RT			
SB	**LT**, T, RT			

Modifications noted in **Bold Orange**

Appendix A: Existing and 2050 Build Condition Intersection Operations Reports

HCM 7th Signalized Intersection Summary
3: 22nd Ave & 20th St S

11/21/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	210	210	15	5	100	110	20	155	20	100	45	60
Future Volume (veh/h)	210	210	15	5	100	110	20	155	20	100	45	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758
Adj Flow Rate, veh/h	233	233	17	6	111	122	22	172	22	111	50	67
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	595	645	47	444	489	525	341	230	29	299	367	498
Arrive On Green	0.13	0.40	0.40	0.00	0.28	0.28	0.02	0.15	0.15	0.07	0.21	0.21
Sat Flow, veh/h	1674	1619	118	1674	1758	1490	1674	1527	195	1674	1758	1490
Grp Volume(v), veh/h	233	0	250	6	111	122	22	0	194	111	50	67
Grp Sat Flow(s),veh/h/ln	1674	0	1737	1674	1758	1490	1674	0	1723	1674	1758	1490
Q Serve(g_s), s	5.2	0.0	5.8	0.1	2.8	3.3	0.6	0.0	6.2	3.1	1.3	1.8
Cycle Q Clear(g_c), s	5.2	0.0	5.8	0.1	2.8	3.3	0.6	0.0	6.2	3.1	1.3	1.8
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	595	0	692	444	489	525	341	0	259	299	367	498
V/C Ratio(X)	0.39	0.00	0.36	0.01	0.23	0.23	0.06	0.00	0.75	0.37	0.14	0.13
Avail Cap(c_a), veh/h	734	0	692	581	489	525	460	0	448	378	518	625
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.9	0.0	12.2	14.9	16.1	13.2	20.4	0.0	23.5	18.4	18.6	13.4
Incr Delay (d2), s/veh	0.2	0.0	1.5	0.0	1.1	1.0	0.0	0.0	4.3	0.3	0.2	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.9	0.0	3.9	0.1	2.1	2.0	0.4	0.0	4.7	2.0	0.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	11.0	0.0	13.7	14.9	17.1	14.2	20.4	0.0	27.8	18.6	18.8	13.5
LnGrp LOS	B		B	B	B	B	C		C	B	B	B
Approach Vol, veh/h		483			239			216			228	
Approach Delay, s/veh		12.4			15.6			27.0			17.2	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	29.5	5.4	18.1	11.7	22.6	8.8	14.7
Change Period (Y+Rc), s	4.5	6.5	4.5	6.0	4.5	6.5	4.5	6.0
Max Green Setting (Gmax), s	5.0	23.0	5.0	17.0	12.0	16.0	7.0	15.0
Max Q Clear Time (g_c+I1), s	2.1	7.8	2.6	3.8	7.2	5.3	5.1	8.2
Green Ext Time (p_c), s	0.0	1.2	0.0	0.3	0.1	0.7	0.0	0.5

Intersection Summary	
HCM 7th Control Delay, s/veh	16.7
HCM 7th LOS	B

Notes

User approved changes to right turn type.

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	365	5	5	165	15	25
Future Vol, veh/h	365	5	5	165	15	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	150	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	406	6	6	183	17	28

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	411	0	603	408
Stage 1	-	-	-	-	408	-
Stage 2	-	-	-	-	194	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1142	-	461	641
Stage 1	-	-	-	-	669	-
Stage 2	-	-	-	-	836	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1142	-	458	641
Mov Cap-2 Maneuver	-	-	-	-	541	-
Stage 1	-	-	-	-	669	-
Stage 2	-	-	-	-	832	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.24	11.24
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	541	641	-	-	1142	-
HCM Lane V/C Ratio	0.031	0.043	-	-	0.005	-
HCM Control Delay (s/veh)	11.9	10.9	-	-	8.2	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	220	110	5	150	65	5
Future Vol, veh/h	220	110	5	150	65	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	185	250	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	244	122	6	167	72	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	367	0	422	244
Stage 1	-	-	-	-	244	-
Stage 2	-	-	-	-	178	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1186	-	586	792
Stage 1	-	-	-	-	794	-
Stage 2	-	-	-	-	851	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1186	-	584	792
Mov Cap-2 Maneuver	-	-	-	-	639	-
Stage 1	-	-	-	-	794	-
Stage 2	-	-	-	-	847	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.26	11.22
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	639	792	-	-	1186	-
HCM Lane V/C Ratio	0.113	0.007	-	-	0.005	-
HCM Control Delay (s/veh)	11.3	9.6	-	-	8	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	125	100	0	0	35	10	120	0	5	0	0	0
Future Vol, veh/h	125	100	0	0	35	10	120	0	5	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	185	-	-	-	-	200	0	-	200	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	139	111	0	0	39	11	133	0	6	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	50	0	-	-	-	0	428	439	111
Stage 1	-	-	-	-	-	-	389	389	-
Stage 2	-	-	-	-	-	-	39	50	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	1550	-	0	0	-	-	582	510	939
Stage 1	-	-	0	0	-	-	683	607	-
Stage 2	-	-	0	0	-	-	981	851	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1550	-	-	-	-	-	530	0	939
Mov Cap-2 Maneuver	-	-	-	-	-	-	548	0	-
Stage 1	-	-	-	-	-	-	622	0	-
Stage 2	-	-	-	-	-	-	981	0	-

Approach	EB	WB	NB
HCM Control Delay, s/v	4.19	0	13.47
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	548	939	1550	-	-	-
HCM Lane V/C Ratio	0.243	0.006	0.09	-	-	-
HCM Control Delay (s/veh)	13.7	8.9	7.6	-	-	-
HCM Lane LOS	B	A	A	-	-	-
HCM 95th %tile Q(veh)	0.9	0	0.3	-	-	-

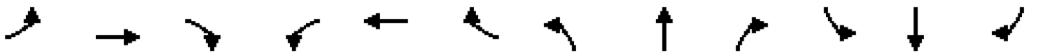
Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	90	5	5	1	5	5	10	35	5	5	10	25
Future Vol, veh/h	90	5	5	1	5	5	10	35	5	5	10	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	150	-	-	200	-	-	200	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	100	6	6	1	6	6	11	39	6	6	11	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	86	89	11	89	114	42	39	0	0	44	0	0
Stage 1	22	22	-	64	64	-	-	-	-	-	-	-
Stage 2	64	67	-	25	50	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	897	799	1067	894	774	1026	1565	-	-	1557	-	-
Stage 1	994	875	-	944	840	-	-	-	-	-	-	-
Stage 2	944	837	-	990	851	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	877	791	1067	874	766	1026	1565	-	-	1557	-	-
Mov Cap-2 Maneuver	877	791	-	874	766	-	-	-	-	-	-	-
Stage 1	990	872	-	938	834	-	-	-	-	-	-	-
Stage 2	926	831	-	975	848	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	9.57	9.15	1.46	0.91
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1565	-	-	877	908	874	877	1557	-	-
HCM Lane V/C Ratio	0.007	-	-	0.114	0.012	0.001	0.013	0.004	-	-
HCM Control Delay (s/veh)	7.3	-	-	9.6	9	9.1	9.2	7.3	-	-
HCM Lane LOS	A	-	-	A	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0	0	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	120	15	25	215	130	25	100	5	105	165	230
Future Volume (veh/h)	125	120	15	25	215	130	25	100	5	105	165	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758
Adj Flow Rate, veh/h	139	133	17	28	239	144	28	111	6	117	183	256
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	491	617	79	577	608	632	250	227	12	347	346	408
Arrive On Green	0.08	0.40	0.40	0.02	0.35	0.35	0.02	0.14	0.14	0.08	0.20	0.20
Sat Flow, veh/h	1674	1527	195	1674	1758	1490	1674	1652	89	1674	1758	1490
Grp Volume(v), veh/h	139	0	150	28	239	144	28	0	117	117	183	256
Grp Sat Flow(s),veh/h/ln	1674	0	1723	1674	1758	1490	1674	0	1742	1674	1758	1490
Q Serve(g_s), s	3.0	0.0	3.4	0.6	6.1	3.7	0.9	0.0	3.7	3.4	5.5	9.0
Cycle Q Clear(g_c), s	3.0	0.0	3.4	0.6	6.1	3.7	0.9	0.0	3.7	3.4	5.5	9.0
Prop In Lane	1.00		0.11	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	491	0	696	577	608	632	250	0	239	347	346	408
V/C Ratio(X)	0.28	0.00	0.22	0.05	0.39	0.23	0.11	0.00	0.49	0.34	0.53	0.63
Avail Cap(c_a), veh/h	588	0	696	687	608	632	360	0	440	441	444	490
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.7	0.0	11.6	12.2	14.7	10.9	21.6	0.0	23.7	19.0	21.4	18.9
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.0	1.9	0.8	0.1	0.0	1.6	0.2	1.3	1.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.7	0.0	2.2	0.4	4.4	2.1	0.6	0.0	2.7	2.2	3.9	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	10.8	0.0	12.3	12.2	16.6	11.7	21.6	0.0	25.3	19.2	22.6	20.8
LnGrp LOS	B		B	B	B	B	C		C	B	C	C
Approach Vol, veh/h		289			411			145			556	
Approach Delay, s/veh		11.6			14.6			24.6			21.1	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	30.5	5.6	17.7	9.1	27.1	9.2	14.2
Change Period (Y+Rc), s	4.5	6.5	4.5	6.0	4.5	6.5	4.5	6.0
Max Green Setting (Gmax), s	5.0	24.0	5.0	15.0	8.0	20.0	8.0	15.0
Max Q Clear Time (g_c+I1), s	2.6	5.4	2.9	11.0	5.0	8.1	5.4	5.7
Green Ext Time (p_c), s	0.0	0.7	0.0	0.7	0.0	1.4	0.0	0.3

Intersection Summary	
HCM 7th Control Delay, s/veh	17.6
HCM 7th LOS	B

Notes

User approved changes to right turn type.

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	260	15	40	405	10	20
Future Vol, veh/h	260	15	40	405	10	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	150	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	289	17	44	450	11	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	306	0	836	297
Stage 1	-	-	-	-	297	-
Stage 2	-	-	-	-	539	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1250	-	336	740
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	583	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1250	-	324	740
Mov Cap-2 Maneuver	-	-	-	-	435	-
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	562	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.72	11.17
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	435	740	-	-	1250	-
HCM Lane V/C Ratio	0.026	0.03	-	-	0.036	-
HCM Control Delay (s/veh)	13.5	10	-	-	8	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	110	120	10	235	135	5
Future Vol, veh/h	110	120	10	235	135	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	185	250	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	122	133	11	261	150	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	256	0	406	122
Stage 1	-	-	-	-	122	-
Stage 2	-	-	-	-	283	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1304	-	599	926
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	762	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1304	-	594	926
Mov Cap-2 Maneuver	-	-	-	-	639	-
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	756	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.32	12.23
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	639	926	-	-	1304	-
HCM Lane V/C Ratio	0.235	0.006	-	-	0.009	-
HCM Control Delay (s/veh)	12.4	8.9	-	-	7.8	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.9	0	-	-	0	-

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	75	40	0	0	100	15	145	0	5	0	0	0
Future Vol, veh/h	75	40	0	0	100	15	145	0	5	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	185	-	-	-	-	200	0	-	200	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	83	44	0	0	111	17	161	0	6	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	128	0	-	-	-	0	322	339	44
Stage 1	-	-	-	-	-	-	211	211	-
Stage 2	-	-	-	-	-	-	111	128	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	1452	-	0	0	-	-	669	581	1023
Stage 1	-	-	0	0	-	-	822	726	-
Stage 2	-	-	0	0	-	-	911	788	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1452	-	-	-	-	-	631	0	1023
Mov Cap-2 Maneuver	-	-	-	-	-	-	652	0	-
Stage 1	-	-	-	-	-	-	775	0	-
Stage 2	-	-	-	-	-	-	911	0	-

Approach	EB	WB	NB
HCM Control Delay, s/v	4.98	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	652	1023	1452	-	-	-
HCM Lane V/C Ratio	0.247	0.005	0.057	-	-	-
HCM Control Delay (s/veh)	12.3	8.5	7.6	-	-	-
HCM Lane LOS	B	A	A	-	-	-
HCM 95th %tile Q(veh)	1	0	0.2	-	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	10	10	1	5	5	5	10	1	5	40	105
Future Vol, veh/h	25	10	10	1	5	5	5	10	1	5	40	105
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	150	-	-	200	-	-	200	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	28	11	11	1	6	6	6	11	1	6	44	117

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	81	79	44	84	195	12	161	0	0	12	0	0
Stage 1	56	56	-	23	23	-	-	-	-	-	-	-
Stage 2	25	23	-	61	172	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	905	809	1023	900	699	1066	1412	-	-	1600	-	-
Stage 1	954	847	-	993	874	-	-	-	-	-	-	-
Stage 2	990	874	-	948	754	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	886	803	1023	872	693	1066	1412	-	-	1600	-	-
Mov Cap-2 Maneuver	886	803	-	872	693	-	-	-	-	-	-	-
Stage 1	951	844	-	989	871	-	-	-	-	-	-	-
Stage 2	975	870	-	922	752	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	9.15	9.32	2.36	0.24
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1412	-	-	886	900	872	840	1600	-	-
HCM Lane V/C Ratio	0.004	-	-	0.031	0.025	0.001	0.013	0.003	-	-
HCM Control Delay (s/veh)	7.6	-	-	9.2	9.1	9.1	9.3	7.3	-	-
HCM Lane LOS	A	-	-	A	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	0	0	-	-

3: 22nd Ave & 20th St S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	10.2	8.6	20.5	12.9	12.3

7: SB Ramps & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.4	0.1
Total Del/Veh (s)	1.0	0.9	6.2	1.6

8: NB Ramps & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.4	0.1
Total Del/Veh (s)	1.7	0.4	6.0	2.9

11: 34th Ave & 20th St S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.7	2.8	0.8
Total Del/Veh (s)	4.9	4.3	0.4	0.2	2.9

14: Ace Ave & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.3	0.0	1.6	0.3
Total Del/Veh (s)	1.0	0.2	5.3	1.0

16: Chaparral Dr & 20th St S Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.9	0.5	1.4

19: 22nd Ave & Canasta Ln Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.2
Total Del/Veh (s)	0.6	0.1	0.5

22: 22nd Ave & Starbucks RIRO Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.0	1.6	1.1

23: Starbucks/Circle K Full & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	0.5	1.5	4.7	1.0

25: Kwik Star Full & 20th St S Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.1	0.2

29: 22nd Ave & Circle K RIRO Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.1	0.2	0.9

30: 22nd Ave & N Dev. Access Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.0
Total Del/Veh (s)	0.1	0.3	0.2

33: East Dev. Access & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	4.2	0.2
Total Del/Veh (s)	0.6	0.5	4.6	0.8

Total Network Performance

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	16.3

3: 22nd Ave & 20th St S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	11.7	9.3	3.8	9.3	15.1	3.2	17.1	21.9	13.3	18.8	15.4	2.0

3: 22nd Ave & 20th St S Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	12.3

7: SB Ramps & 20th St S Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	3.4	0.1
Total Del/Veh (s)	0.9	1.1	3.2	0.8	6.4	3.2	1.6

8: NB Ramps & 20th St S Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	4.0	0.1
Total Del/Veh (s)	2.5	0.8	0.4	0.2	6.1	2.8	2.9

11: 34th Ave & 20th St S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0		0.2	0.1	3.2	0.1	0.1	3.7	0.3	3.7
Total Del/Veh (s)	4.9	6.4	1.9		6.9	1.9	0.6	0.5	0.0	0.8	0.4	0.1

11: 34th Ave & 20th St S Performance by movement

Movement	All
Denied Del/Veh (s)	0.8
Total Del/Veh (s)	2.9

14: Ace Ave & 20th St S Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.3	0.5	0.0	0.0	4.3	0.1	0.3
Total Del/Veh (s)	1.0	0.7	3.7	0.1	7.2	4.2	1.0

16: Chaparral Dr & 20th St S Performance by movement

Movement	EBT	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.9	0.5	1.4

19: 22nd Ave & Canasta Ln Performance by movement

Movement	NBT	SBT	All
Denied Del/Veh (s)	0.2	0.0	0.2
Total Del/Veh (s)	0.6	0.1	0.5

22: 22nd Ave & Starbucks RIRO Performance by movement

Movement	NBT	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.0	1.6	1.1

23: Starbucks/Circle K Full & 20th St S Performance by movement

Movement	EBT	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	0.5	4.1	1.4	4.7	1.0

25: Kwik Star Full & 20th St S Performance by movement

Movement	EBT	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.1	0.2

29: 22nd Ave & Circle K RIRO Performance by movement

Movement	NBT	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.1	0.2	0.9

30: 22nd Ave & N Dev. Access Performance by movement

Movement	NBT	SBT	All
Denied Del/Veh (s)	0.0	0.2	0.0
Total Del/Veh (s)	0.1	0.3	0.2

33: East Dev. Access & 20th St S Performance by movement

Movement	EBT	EBR	WBT	NBL	All
Denied Del/Veh (s)	0.0	0.0	0.0	4.2	0.2
Total Del/Veh (s)	0.6	0.7	0.5	4.6	0.8

Total Network Performance

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	16.3

Intersection: 3: 22nd Ave & 20th St S

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	148	136	21	98	70	81	139	112	68	54
Average Queue (ft)	64	55	2	37	31	16	80	46	20	15
95th Queue (ft)	116	111	13	78	58	54	131	88	49	37
Link Distance (ft)		261		1007			134		200	200
Upstream Blk Time (%)						0	1			
Queuing Penalty (veh)						0	2			
Storage Bay Dist (ft)	150		250		275	185		190		
Storage Blk Time (%)	0	0				0	1			
Queuing Penalty (veh)	1	0				0	0			

Intersection: 7: SB Ramps & 20th St S

Movement	EB	WB	NB	NB
Directions Served	R	L	L	R
Maximum Queue (ft)	4	21	66	21
Average Queue (ft)	0	1	26	3
95th Queue (ft)	3	12	51	15
Link Distance (ft)			1036	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	185	250		150
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: NB Ramps & 20th St S

Movement	EB	WB	NB	NB
Directions Served	L	R	L	TR
Maximum Queue (ft)	44	2	83	30
Average Queue (ft)	7	0	37	5
95th Queue (ft)	30	2	63	22
Link Distance (ft)			1072	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	185	200		200
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: 34th Ave & 20th St S

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	L	L
Maximum Queue (ft)	70	23	8	31	8	14
Average Queue (ft)	32	7	0	10	0	0
95th Queue (ft)	56	22	5	32	5	6
Link Distance (ft)		769		1839		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200		150		200	200
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 14: Ace Ave & 20th St S

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	25	35	51
Average Queue (ft)	2	13	18
95th Queue (ft)	14	38	46
Link Distance (ft)			856
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	150	150	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: Chaparral Dr & 20th St S

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 19: 22nd Ave & Canasta Ln

Movement	
Directions Served	
Maximum Queue (ft)	
Average Queue (ft)	
95th Queue (ft)	
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 22: 22nd Ave & Starbucks RIRO

Movement	NB
Directions Served	T
Maximum Queue (ft)	40
Average Queue (ft)	2
95th Queue (ft)	18
Link Distance (ft)	112
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 23: Starbucks/Circle K Full & 20th St S

Movement	WB	NB
Directions Served	L	TR
Maximum Queue (ft)	21	48
Average Queue (ft)	2	18
95th Queue (ft)	13	45
Link Distance (ft)		239
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 25: Kwik Star Full & 20th St S

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 29: 22nd Ave & Circle K RIRO

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 30: 22nd Ave & N Dev. Access

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 33: East Dev. Access & 20th St S

Movement	NB
Directions Served	L
Maximum Queue (ft)	31
Average Queue (ft)	6
95th Queue (ft)	25
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	75
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 3

3: 22nd Ave & 20th St S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	9.7	10.5	22.7	12.0	12.2

7: SB Ramps & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.3	0.1
Total Del/Veh (s)	0.8	1.0	7.2	2.3

8: NB Ramps & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.4	0.1
Total Del/Veh (s)	1.6	0.5	5.8	2.8

11: 34th Ave & 20th St S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.2	1.3	2.7	1.9
Total Del/Veh (s)	4.1	4.5	0.5	0.5	1.4

14: Ace Ave & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.2	0.0	1.5	0.1
Total Del/Veh (s)	0.8	0.4	5.5	0.8

16: Chaparral Dr & 20th St S Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.6	0.7	1.1

19: 22nd Ave & Canasta Ln Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.1
Total Del/Veh (s)	0.4	0.2	0.3

22: 22nd Ave & Starbucks RIRO Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.7	2.0	1.5

23: Starbucks/Circle K Full & 20th St S Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	1.5	1.1

25: Kwik Star Full & 20th St S Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.3	0.3

29: 22nd Ave & Circle K RIRO Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.1	0.6	0.8

30: 22nd Ave & N Dev. Access Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.1
Total Del/Veh (s)	0.1	0.7	0.4

33: East Dev. Access & 20th St S Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.3	0.3

Total Network Performance

Denied Del/Veh (s)	0.6
Total Del/Veh (s)	16.2

3: 22nd Ave & 20th St S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	10.9	9.0	4.9	10.3	15.1	3.0	18.9	24.1	13.3	17.6	18.8	4.2

3: 22nd Ave & 20th St S Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	12.2

7: SB Ramps & 20th St S Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	3.6	0.1
Total Del/Veh (s)	0.7	0.9	3.4	0.9	7.4	3.1	2.3

8: NB Ramps & 20th St S Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	4.0	0.1
Total Del/Veh (s)	2.3	0.4	0.5	0.3	6.0	2.6	2.8

11: 34th Ave & 20th St S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.0	0.0		0.1	0.1	3.4	0.1	0.1	3.0	0.4	3.5
Total Del/Veh (s)	4.1	6.3	1.7		7.7	1.7	0.8	0.3	0.0	0.7	0.7	0.4

11: 34th Ave & 20th St S Performance by movement

Movement	All
Denied Del/Veh (s)	1.9
Total Del/Veh (s)	1.4

14: Ace Ave & 20th St S Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.2	0.2	0.0	0.0	4.3	0.1	0.1
Total Del/Veh (s)	0.8	0.6	2.6	0.2	10.3	3.1	0.8

16: Chaparral Dr & 20th St S Performance by movement

Movement	EBT	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.6	0.7	1.1

19: 22nd Ave & Canasta Ln Performance by movement

Movement	NBT	SBT	All
Denied Del/Veh (s)	0.2	0.0	0.1
Total Del/Veh (s)	0.4	0.2	0.3

22: 22nd Ave & Starbucks RIRO Performance by movement

Movement	NBT	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.7	2.0	1.5

23: Starbucks/Circle K Full & 20th St S Performance by movement

Movement	EBT	EBR	WBL	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.4	0.0	3.6	1.4	1.1

25: Kwik Star Full & 20th St S Performance by movement

Movement	EBT	EBR	WBL	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.1	2.4	0.2	0.3

29: 22nd Ave & Circle K RIRO Performance by movement

Movement	NBT	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.1	0.6	0.8

30: 22nd Ave & N Dev. Access Performance by movement

Movement	NBT	SBT	All
Denied Del/Veh (s)	0.0	0.2	0.1
Total Del/Veh (s)	0.1	0.7	0.4

33: East Dev. Access & 20th St S Performance by movement

Movement	EBT	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.3	0.3

Total Network Performance

Denied Del/Veh (s)	0.6
Total Del/Veh (s)	16.2

Intersection: 3: 22nd Ave & 20th St S

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	103	108	46	157	73	69	130	105	148	90
Average Queue (ft)	41	34	12	71	30	19	61	48	66	43
95th Queue (ft)	79	79	35	128	61	52	107	88	120	77
Link Distance (ft)		261		1007			134		200	200
Upstream Blk Time (%)							0		0	
Queuing Penalty (veh)							0		0	
Storage Bay Dist (ft)	150		250		275	185		190		
Storage Blk Time (%)		0					0		0	
Queuing Penalty (veh)		0					0		0	

Intersection: 7: SB Ramps & 20th St S

Movement	EB	WB	NB	NB
Directions Served	R	L	L	R
Maximum Queue (ft)	6	27	83	22
Average Queue (ft)	0	3	38	4
95th Queue (ft)	5	16	65	16
Link Distance (ft)			1036	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	185	250		150
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: NB Ramps & 20th St S

Movement	EB	NB	NB
Directions Served	L	L	TR
Maximum Queue (ft)	45	82	30
Average Queue (ft)	8	38	5
95th Queue (ft)	30	64	23
Link Distance (ft)		1072	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	185		200
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 11: 34th Ave & 20th St S

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	L	L	R
Maximum Queue (ft)	45	28	6	31	16	2	2
Average Queue (ft)	15	10	0	9	1	0	0
95th Queue (ft)	38	27	4	31	7	2	2
Link Distance (ft)		769		1839			
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	200		150		200	200	200
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 14: Ace Ave & 20th St S

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	2	35	39	51
Average Queue (ft)	0	8	10	15
95th Queue (ft)	2	31	35	43
Link Distance (ft)	1489			856
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		150	150	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 16: Chaparral Dr & 20th St S

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 19: 22nd Ave & Canasta Ln

Movement	
Directions Served	
Maximum Queue (ft)	
Average Queue (ft)	
95th Queue (ft)	
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 22: 22nd Ave & Starbucks RIRO

Movement	NB
Directions Served	T
Maximum Queue (ft)	19
Average Queue (ft)	1
95th Queue (ft)	9
Link Distance (ft)	112
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 23: Starbucks/Circle K Full & 20th St S

Movement	WB
Directions Served	L
Maximum Queue (ft)	26
Average Queue (ft)	4
95th Queue (ft)	19
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	50
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 25: Kwik Star Full & 20th St S

Movement	WB
Directions Served	L
Maximum Queue (ft)	29
Average Queue (ft)	2
95th Queue (ft)	15
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	75
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 29: 22nd Ave & Circle K RIRO

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 30: 22nd Ave & N Dev. Access

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

HCM 7th Signalized Intersection Summary
3: 22nd Ave & 20th St S

11/21/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	335	520	35	55	315	255	40	220	110	315	105	110
Future Volume (veh/h)	335	520	35	55	315	255	40	220	110	315	105	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758
Adj Flow Rate, veh/h	372	578	39	61	350	283	44	244	122	350	117	122
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	420	836	766	265	462	624	318	313	151	383	871	621
Arrive On Green	0.16	0.48	0.48	0.35	0.35	0.35	0.04	0.14	0.14	0.16	0.26	0.26
Sat Flow, veh/h	1674	1758	1490	800	1758	1490	1674	2182	1056	1674	3340	1490
Grp Volume(v), veh/h	372	578	39	61	350	283	44	185	181	350	117	122
Grp Sat Flow(s),veh/h/ln	1674	1758	1490	800	1758	1490	1674	1670	1568	1674	1670	1490
Q Serve(g_s), s	12.5	20.6	1.0	4.8	14.1	10.4	1.8	8.5	9.0	12.5	2.1	4.2
Cycle Q Clear(g_c), s	12.5	20.6	1.0	8.4	14.1	10.4	1.8	8.5	9.0	12.5	2.1	4.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.67	1.00		1.00
Lane Grp Cap(c), veh/h	420	836	766	265	462	624	318	239	225	383	871	621
V/C Ratio(X)	0.89	0.69	0.05	0.23	0.76	0.45	0.14	0.77	0.81	0.91	0.13	0.20
Avail Cap(c_a), veh/h	420	836	766	265	462	624	430	282	265	383	871	621
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.8	16.4	9.7	23.3	23.8	14.6	27.5	33.0	33.2	25.1	22.7	14.8
Incr Delay (d2), s/veh	19.7	4.7	0.1	2.0	11.0	2.4	0.2	10.6	14.4	25.7	0.1	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.9	13.2	0.6	1.8	10.5	6.0	1.3	7.2	7.5	12.6	1.5	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	38.5	21.1	9.8	25.3	34.8	16.9	27.7	43.6	47.6	50.9	22.7	15.0
LnGrp LOS	D	C	A	C	C	B	C	D	D	D	C	B
Approach Vol, veh/h		989			694			410			589	
Approach Delay, s/veh		27.2			26.7			43.7			37.8	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	45.0	7.6	27.4	17.0	28.0	17.0	18.0
Change Period (Y+Rc), s	7.0	4.5	6.5	4.5	7.0	4.5	6.5
Max Green Setting (Gmax), s	36.0	8.5	17.5	12.5	19.0	12.5	13.5
Max Q Clear Time (g_c+I1), s	22.6	3.8	6.2	14.5	16.1	14.5	11.0
Green Ext Time (p_c), s	3.2	0.0	0.8	0.0	1.0	0.0	0.5

Intersection Summary	
HCM 7th Control Delay, s/veh	31.9
HCM 7th LOS	C

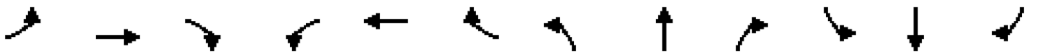
Notes

User approved changes to right turn type.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	715	205	45	470	155	65
Future Volume (veh/h)	715	205	45	470	155	65
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1758	1758	1758	1758	1758	1758
Adj Flow Rate, veh/h	794	228	50	522	172	72
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1268	1266	485	1268	216	192
Arrive On Green	1.00	1.00	1.00	1.00	0.13	0.13
Sat Flow, veh/h	1758	1490	547	1758	1674	1490
Grp Volume(v), veh/h	794	228	50	522	172	72
Grp Sat Flow(s),veh/h/ln	1758	1490	547	1758	1674	1490
Q Serve(g_s), s	0.0	0.0	0.0	0.0	8.0	3.5
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	8.0	3.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1268	1266	485	1268	216	192
V/C Ratio(X)	0.63	0.18	0.10	0.41	0.80	0.38
Avail Cap(c_a), veh/h	1268	1266	485	1268	339	302
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.87	0.87	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	33.8	31.9
Incr Delay (d2), s/veh	2.3	0.3	0.4	0.9	6.9	1.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.5	0.2	0.1	0.5	6.4	2.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	2.3	0.3	0.4	0.9	40.8	33.1
LnGrp LOS	A	A	A	A	D	C
Approach Vol, veh/h	1022			572	244	
Approach Delay, s/veh	1.9			0.8	38.5	
Approach LOS	A			A	D	

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	63.7			63.7	16.3
Change Period (Y+Rc), s	6.0			6.0	6.0
Max Green Setting (Gmax), s	51.8			51.8	16.2
Max Q Clear Time (g_c+I1), s	2.0			2.0	10.0
Green Ext Time (p_c), s	8.0			4.4	0.4

Intersection Summary	
HCM 7th Control Delay, s/veh	6.4
HCM 7th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	540	0	0	280	70	235	0	100	0	0	0
Future Volume (veh/h)	240	540	0	0	280	70	235	0	100	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1758	1758	0	0	1758	1758	1758	1758	1758			
Adj Flow Rate, veh/h	267	600	0	0	311	78	261	0	111			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	673	1166	0	0	1166	988	313	0	278			
Arrive On Green	1.00	1.00	0.00	0.00	0.66	0.66	0.19	0.00	0.19			
Sat Flow, veh/h	987	1758	0	0	1758	1490	1674	0	1490			
Grp Volume(v), veh/h	267	600	0	0	311	78	261	0	111			
Grp Sat Flow(s),veh/h/ln	987	1758	0	0	1758	1490	1674	0	1490			
Q Serve(g_s), s	4.0	0.0	0.0	0.0	5.8	1.5	12.0	0.0	5.2			
Cycle Q Clear(g_c), s	9.8	0.0	0.0	0.0	5.8	1.5	12.0	0.0	5.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	673	1166	0	0	1166	988	313	0	278			
V/C Ratio(X)	0.40	0.51	0.00	0.00	0.27	0.08	0.83	0.00	0.40			
Avail Cap(c_a), veh/h	673	1166	0	0	1166	988	481	0	428			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.74	0.74	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.5	0.0	0.0	0.0	5.5	4.8	31.3	0.0	28.6			
Incr Delay (d2), s/veh	1.3	1.2	0.0	0.0	0.6	0.2	7.5	0.0	0.9			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(95%),veh/ln	0.4	0.7	0.0	0.0	3.3	0.7	8.8	0.0	3.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	1.8	1.2	0.0	0.0	6.1	4.9	38.8	0.0	29.5			
LnGrp LOS	A	A			A	A	D		C			
Approach Vol, veh/h		867			389			372				
Approach Delay, s/veh		1.4			5.8			36.0				
Approach LOS		A			A			D				
Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		59.1				59.1		20.9				
Change Period (Y+Rc), s		6.0				6.0		6.0				
Max Green Setting (Gmax), s		45.0				45.0		23.0				
Max Q Clear Time (g_c+I1), s		11.8				7.8		14.0				
Green Ext Time (p_c), s		6.0				2.2		0.9				
Intersection Summary												
HCM 7th Control Delay, s/veh			10.4									
HCM 7th LOS			B									

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	710	50	20	355	35	50
Future Vol, veh/h	710	50	20	355	35	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	150	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	789	56	22	394	39	56

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	844	0	1256	817
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	439	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	788	-	188	375
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	648	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	788	-	183	375
Mov Cap-2 Maneuver	-	-	-	-	313	-
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	630	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.52	17.02
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	313	375	-	-	788	-
HCM Lane V/C Ratio	0.124	0.148	-	-	0.028	-
HCM Control Delay (s/veh)	18.1	16.3	-	-	9.7	-
HCM Lane LOS	C	C	-	-	A	-
HCM 95th %tile Q(veh)	0.4	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	44.5

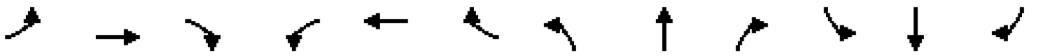
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	250	65	140	55	95	55	130	90	40	40	60	135
Future Vol, veh/h	250	65	140	55	95	55	130	90	40	40	60	135
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	150	-	-	200	-	-	200	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	278	72	156	61	106	61	144	100	44	44	67	150

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	597	589	67	603	717	122	217	0	0	144	0	0
Stage 1	156	156	-	411	411	-	-	-	-	-	-	-
Stage 2	442	433	-	192	306	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	413	419	994	410	354	926	1347	-	-	1432	-	-
Stage 1	844	767	-	616	593	-	-	-	-	-	-	-
Stage 2	593	580	-	808	660	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 229	363	994	246	306	926	1347	-	-	1432	-	-
Mov Cap-2 Maneuver	~ 229	363	-	246	306	-	-	-	-	-	-	-
Stage 1	818	743	-	550	529	-	-	-	-	-	-	-
Stage 2	396	518	-	596	640	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	100.62	21.11	4	1.29
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1347	-	-	229	641	246	406	1432	-	-
HCM Lane V/C Ratio	0.107	-	-	1.21	0.356	0.248	0.41	0.031	-	-
HCM Control Delay (s/veh)	8	-	-	171.9	13.7	24.4	19.9	7.6	-	-
HCM Lane LOS	A	-	-	F	B	C	C	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	13.7	1.6	1	2	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	285	55	100	515	360	65	175	50	285	260	365
Future Volume (veh/h)	225	285	55	100	515	360	65	175	50	285	260	365
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758
Adj Flow Rate, veh/h	250	317	61	111	572	400	72	194	56	317	289	406
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	333	927	861	454	641	758	252	268	75	363	658	452
Arrive On Green	0.11	0.53	0.53	0.73	0.73	0.73	0.05	0.10	0.10	0.14	0.20	0.20
Sat Flow, veh/h	1674	1758	1490	997	1758	1490	1674	2574	723	1674	3340	1490
Grp Volume(v), veh/h	250	317	61	111	572	400	72	124	126	317	289	406
Grp Sat Flow(s),veh/h/ln	1674	1758	1490	997	1758	1490	1674	1670	1628	1674	1670	1490
Q Serve(g_s), s	7.1	8.3	1.4	3.1	20.2	9.7	3.0	5.7	6.0	11.5	6.1	15.8
Cycle Q Clear(g_c), s	7.1	8.3	1.4	3.1	20.2	9.7	3.0	5.7	6.0	11.5	6.1	15.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.44	1.00		1.00
Lane Grp Cap(c), veh/h	333	927	861	454	641	758	252	174	169	363	658	452
V/C Ratio(X)	0.75	0.34	0.07	0.24	0.89	0.53	0.29	0.71	0.74	0.87	0.44	0.90
Avail Cap(c_a), veh/h	333	927	861	454	641	758	345	219	214	363	658	452
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	10.9	7.4	7.3	9.6	5.1	29.9	34.7	34.8	27.7	28.2	26.7
Incr Delay (d2), s/veh	9.2	1.0	0.2	1.3	17.1	2.6	0.6	7.8	10.2	20.2	0.5	20.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.8	5.6	0.8	1.3	10.2	3.7	2.2	4.7	5.0	11.5	4.3	14.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	26.1	11.9	7.6	8.6	26.7	7.8	30.5	42.5	45.0	47.9	28.7	47.1
LnGrp LOS	C	B	A	A	C	A	C	D	D	D	C	D
Approach Vol, veh/h		628			1083			322			1012	
Approach Delay, s/veh		17.1			17.9			40.8			42.1	
Approach LOS		B			B			D			D	

Timer - Assigned Phs	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	49.2	8.6	22.3	13.0	36.2	16.0	14.8
Change Period (Y+Rc), s	7.0	4.5	6.5	4.5	7.0	4.5	6.5
Max Green Setting (Gmax), s	40.0	8.5	13.5	8.5	27.0	11.5	10.5
Max Q Clear Time (g_c+I1), s	10.3	5.0	17.8	9.1	22.2	13.5	8.0
Green Ext Time (p_c), s	2.1	0.0	0.0	0.0	2.5	0.0	0.3

Intersection Summary	
HCM 7th Control Delay, s/veh	28.2
HCM 7th LOS	C

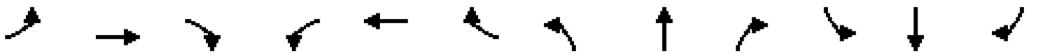
Notes

User approved changes to right turn type.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	380	240	60	705	245	40
Future Volume (veh/h)	380	240	60	705	245	40
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1758	1758	1758	1758	1758	1758
Adj Flow Rate, veh/h	422	267	67	783	272	44
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1163	1266	585	1163	315	280
Arrive On Green	1.00	1.00	0.88	0.88	0.19	0.19
Sat Flow, veh/h	1758	1490	748	1758	1674	1490
Grp Volume(v), veh/h	422	267	67	783	272	44
Grp Sat Flow(s),veh/h/ln	1758	1490	748	1758	1674	1490
Q Serve(g_s), s	0.0	0.0	1.0	10.5	12.6	2.0
Cycle Q Clear(g_c), s	0.0	0.0	1.0	10.5	12.6	2.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1163	1266	585	1163	315	280
V/C Ratio(X)	0.36	0.21	0.11	0.67	0.86	0.16
Avail Cap(c_a), veh/h	1163	1266	585	1163	419	372
HCM Platoon Ratio	2.00	2.00	1.33	1.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.76	0.76	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	1.7	2.3	31.5	27.2
Incr Delay (d2), s/veh	0.9	0.4	0.3	2.4	13.3	0.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	0.2	0.3	4.0	10.1	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.9	0.4	2.0	4.6	44.8	27.4
LnGrp LOS	A	A	A	A	D	C
Approach Vol, veh/h	689			850	316	
Approach Delay, s/veh	0.7			4.4	42.4	
Approach LOS	A			A	D	

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	58.9			58.9	21.1
Change Period (Y+Rc), s	6.0			6.0	6.0
Max Green Setting (Gmax), s	48.0			48.0	20.0
Max Q Clear Time (g_c+I1), s	2.0			12.5	14.6
Green Ext Time (p_c), s	3.8			7.2	0.5

Intersection Summary	
HCM 7th Control Delay, s/veh	9.5
HCM 7th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	185	235	0	0	495	95	270	0	50	0	0	0
Future Volume (veh/h)	185	235	0	0	495	95	270	0	50	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1758	1758	0	0	1758	1758	1758	1758	1758			
Adj Flow Rate, veh/h	206	261	0	0	550	106	300	0	56			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	461	1132	0	0	1132	959	345	0	307			
Arrive On Green	0.86	0.86	0.00	0.00	0.64	0.64	0.21	0.00	0.21			
Sat Flow, veh/h	771	1758	0	0	1758	1490	1674	0	1490			
Grp Volume(v), veh/h	206	261	0	0	550	106	300	0	56			
Grp Sat Flow(s),veh/h/ln	771	1758	0	0	1758	1490	1674	0	1490			
Q Serve(g_s), s	11.9	2.1	0.0	0.0	13.0	2.2	13.9	0.0	2.5			
Cycle Q Clear(g_c), s	24.9	2.1	0.0	0.0	13.0	2.2	13.9	0.0	2.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	461	1132	0	0	1132	959	345	0	307			
V/C Ratio(X)	0.45	0.23	0.00	0.00	0.49	0.11	0.87	0.00	0.18			
Avail Cap(c_a), veh/h	461	1132	0	0	1132	959	460	0	410			
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.94	0.94	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	7.5	2.2	0.0	0.0	7.4	5.5	30.7	0.0	26.2			
Incr Delay (d2), s/veh	2.9	0.4	0.0	0.0	1.5	0.2	12.9	0.0	0.3			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(95%),veh/ln	2.9	1.2	0.0	0.0	7.7	1.1	10.5	0.0	1.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	10.4	2.6	0.0	0.0	8.9	5.7	43.6	0.0	26.5			
LnGrp LOS	B	A			A	A	D		C			
Approach Vol, veh/h		467			656			356				
Approach Delay, s/veh		6.1			8.4			40.9				
Approach LOS		A			A			D				

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		57.5				57.5		22.5				
Change Period (Y+Rc), s		6.0				6.0		6.0				
Max Green Setting (Gmax), s		46.0				46.0		22.0				
Max Q Clear Time (g_c+I1), s		26.9				15.0		15.9				
Green Ext Time (p_c), s		2.8				4.2		0.6				

Intersection Summary												
HCM 7th Control Delay, s/veh			15.5									
HCM 7th LOS			B									

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	490	45	65	780	35	45
Future Vol, veh/h	490	45	65	780	35	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	150	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	544	50	72	867	39	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	594	0	1581	569
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	1011	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	977	-	119	519
Stage 1	-	-	-	-	564	-
Stage 2	-	-	-	-	350	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	977	-	110	519
Mov Cap-2 Maneuver	-	-	-	-	233	-
Stage 1	-	-	-	-	564	-
Stage 2	-	-	-	-	324	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.69	17.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	233	519	-	-	977	-
HCM Lane V/C Ratio	0.167	0.096	-	-	0.074	-
HCM Control Delay (s/veh)	23.5	12.7	-	-	9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.3	-	-	0.2	-

Intersection	
Int Delay, s/veh	13.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	125	95	105	35	60	35	165	50	45	50	90	255
Future Vol, veh/h	125	95	105	35	60	35	165	50	45	50	90	255
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	150	-	-	200	-	-	200	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	139	106	117	39	67	39	183	56	50	56	100	283

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	667	683	100	711	942	81	383	0	0	106	0	0
Stage 1	211	211	-	447	447	-	-	-	-	-	-	-
Stage 2	456	472	-	264	494	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	371	370	953	347	262	977	1170	-	-	1479	-	-
Stage 1	789	726	-	589	572	-	-	-	-	-	-	-
Stage 2	583	557	-	739	545	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	211	300	953	171	213	977	1170	-	-	1479	-	-
Mov Cap-2 Maneuver	211	300	-	171	213	-	-	-	-	-	-	-
Stage 1	759	698	-	496	482	-	-	-	-	-	-	-
Stage 2	406	470	-	530	524	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	31.11	25.79	5.49	0.95
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1170	-	-	211	469	171	299	1479	-	-
HCM Lane V/C Ratio	0.157	-	-	0.658	0.474	0.227	0.353	0.038	-	-
HCM Control Delay (s/veh)	8.6	-	-	49.9	19.4	32	23.5	7.5	-	-
HCM Lane LOS	A	-	-	E	C	D	C	A	-	-
HCM 95th %tile Q(veh)	0.6	-	-	4	2.5	0.8	1.5	0.1	-	-

3: 22nd Ave & 20th St S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.0
Total Del/Veh (s)	24.0	29.8	30.9	32.8	28.5

7: SB Ramps & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	1.3	0.2
Total Del/Veh (s)	6.9	5.3	25.5	8.9

8: NB Ramps & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	1.5	0.3
Total Del/Veh (s)	9.5	6.1	28.3	13.1

11: 34th Ave & 20th St S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.8	1.7	2.7	1.1
Total Del/Veh (s)	14.7	12.0	2.5	1.2	8.8

14: Ace Ave & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.7	0.0	1.8	0.6
Total Del/Veh (s)	2.9	0.8	14.3	3.1

16: Chaparral Dr & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	2.4	0.1
Total Del/Veh (s)	4.4	2.8	50.6	6.2

19: 22nd Ave & Canasta Ln Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.9	0.8	0.4	0.0	0.4
Total Del/Veh (s)	5.5	4.6	1.4	0.5	1.5

22: 22nd Ave & Starbucks RIRO Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	2.5	1.3	1.5	1.4

23: Starbucks/Circle K Full & 20th St S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	24.0	233.7	18.5
Total Del/Veh (s)	5.3	3.9	122.1	195.5	24.7

25: Kwik Star Full & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.1	0.0	7.9	0.9
Total Del/Veh (s)	2.8	3.6	29.0	5.8

29: 22nd Ave & Circle K RIRO Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	21.9	1.3	3.0	2.5

30: 22nd Ave & N Dev. Access Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	2.0	4.2	0.0	0.2	0.2
Total Del/Veh (s)	8.4	18.2	0.5	1.0	1.1

33: East Dev. Access & 20th St S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	2.3	1.5	0.2
Total Del/Veh (s)	5.0	2.6	12.3	9.5	5.0

Total Network Performance

Denied Del/Veh (s)	8.6
Total Del/Veh (s)	48.1

Intersection: 3: 22nd Ave & 20th St S

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	T
Maximum Queue (ft)	175	274	186	223	413	263	89	130	131	200	248	47
Average Queue (ft)	150	201	22	54	182	72	23	75	87	152	112	11
95th Queue (ft)	207	307	110	141	318	180	61	122	134	221	258	36
Link Distance (ft)		250			1006			122	122		201	201
Upstream Blk Time (%)		6					0	1	3	6	9	
Queuing Penalty (veh)		55					0	2	6	0	23	
Storage Bay Dist (ft)	150		200	250		275	185			190		
Storage Blk Time (%)	11	14	0		4	0	0	1		10	9	
Queuing Penalty (veh)	60	51	0		14	0	0	1		5	28	

Intersection: 3: 22nd Ave & 20th St S

Movement	SB
Directions Served	R
Maximum Queue (ft)	83
Average Queue (ft)	27
95th Queue (ft)	61
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	195
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: SB Ramps & 20th St S

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (ft)	231	130	68	133	170	113
Average Queue (ft)	103	20	27	46	87	28
95th Queue (ft)	191	78	60	105	148	71
Link Distance (ft)	872			848	1036	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		185	250			150
Storage Blk Time (%)	1	0			1	0
Queuing Penalty (veh)	1	0			0	0

Intersection: 8: NB Ramps & 20th St S

Movement	EB	EB	WB	WB	NB	NB
Directions Served	L	T	T	R	L	TR
Maximum Queue (ft)	153	171	154	60	240	139
Average Queue (ft)	64	61	62	19	130	45
95th Queue (ft)	117	128	123	47	208	96
Link Distance (ft)		848	1461		1072	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	185			200		200
Storage Blk Time (%)	0	0	0		2	0
Queuing Penalty (veh)	1	0	0		2	0

Intersection: 11: 34th Ave & 20th St S

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	R
Maximum Queue (ft)	168	160	83	113	62	7	38	25
Average Queue (ft)	83	48	32	51	21	0	6	4
95th Queue (ft)	151	116	62	88	53	5	26	19
Link Distance (ft)		769		1839		1513		
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	200		150		200		200	200
Storage Blk Time (%)	1			0				
Queuing Penalty (veh)	1			0				

Intersection: 14: Ace Ave & 20th St S

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	31	47	60	74
Average Queue (ft)	1	12	26	31
95th Queue (ft)	16	40	55	58
Link Distance (ft)	1489			856
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		150	150	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 16: Chaparral Dr & 20th St S

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	25	79	122	68
Average Queue (ft)	2	30	50	26
95th Queue (ft)	13	65	111	58
Link Distance (ft)	1006			371
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		200	150	
Storage Blk Time (%)			2	
Queuing Penalty (veh)			1	

Intersection: 19: 22nd Ave & Canasta Ln

Movement	EB	EB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	TR	L	TR	L
Maximum Queue (ft)	31	26	26	44	29	2	42
Average Queue (ft)	10	8	4	14	2	0	6
95th Queue (ft)	30	25	18	39	15	2	26
Link Distance (ft)		370		505		1681	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	150		150		150		75
Storage Blk Time (%)							0
Queuing Penalty (veh)							0

Intersection: 22: 22nd Ave & Starbucks RIRO

Movement	EB	NB	NB	SB	SB
Directions Served	R	T	T	T	TR
Maximum Queue (ft)	32	32	63	12	9
Average Queue (ft)	10	2	5	0	0
95th Queue (ft)	33	19	32	12	9
Link Distance (ft)	112	112	112	122	122
Upstream Blk Time (%)		0	0	0	
Queuing Penalty (veh)		0	0	0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 23: Starbucks/Circle K Full & 20th St S

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	79	240	36	26	104	210	125	261
Average Queue (ft)	18	58	10	1	19	79	97	142
95th Queue (ft)	54	194	34	11	72	210	154	321
Link Distance (ft)		242		250		239		233
Upstream Blk Time (%)		1				11		42
Queuing Penalty (veh)		8				0		0
Storage Bay Dist (ft)	75		50		100		100	
Storage Blk Time (%)	0	6	0	0		21	59	1
Queuing Penalty (veh)	1	3	1	0		3	21	1

Intersection: 25: Kwik Star Full & 20th St S

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (ft)	159	89	63	98	150
Average Queue (ft)	16	37	3	32	58
95th Queue (ft)	90	72	32	82	128
Link Distance (ft)	241		242		178
Upstream Blk Time (%)	0				4
Queuing Penalty (veh)	1				0
Storage Bay Dist (ft)		75		100	
Storage Blk Time (%)		1		1	6
Queuing Penalty (veh)		5		1	2

Intersection: 29: 22nd Ave & Circle K RIRO

Movement	EB	SB
Directions Served	R	T
Maximum Queue (ft)	75	174
Average Queue (ft)	26	25
95th Queue (ft)	64	115
Link Distance (ft)	183	467
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 30: 22nd Ave & N Dev. Access

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	L	TR	T	TR
Maximum Queue (ft)	49	56	56	39	2	6	25
Average Queue (ft)	15	16	16	8	0	0	1
95th Queue (ft)	42	44	46	31	2	6	23
Link Distance (ft)		408			467	1684	1684
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	150		150	150			
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 33: East Dev. Access & 20th St S

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	56	22	60	7	62	55	54	62
Average Queue (ft)	21	2	21	0	26	23	19	28
95th Queue (ft)	50	11	52	5	55	52	47	54
Link Distance (ft)		1461		769		290		302
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	150		150		75		75	
Storage Blk Time (%)					0	0	0	0
Queuing Penalty (veh)					0	0	0	0

Network Summary

Network wide Queuing Penalty: 297

3: 22nd Ave & 20th St S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	16.7	35.3	31.4	26.0	27.9

7: SB Ramps & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.8	0.1
Total Del/Veh (s)	6.4	9.1	27.5	11.3

8: NB Ramps & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.9	0.2
Total Del/Veh (s)	11.9	7.9	33.0	15.1

11: 34th Ave & 20th St S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.6	2.1	2.7	1.5
Total Del/Veh (s)	12.0	13.0	3.4	1.9	6.6

14: Ace Ave & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.5	0.0	2.0	0.3
Total Del/Veh (s)	1.9	0.8	14.1	2.0

16: Chaparral Dr & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	1.8	0.2
Total Del/Veh (s)	3.4	4.5	92.5	14.0

19: 22nd Ave & Canasta Ln Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	2.1	1.0	0.4	0.0	0.4
Total Del/Veh (s)	6.7	5.5	1.2	0.6	1.7

22: 22nd Ave & Starbucks RIRO Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	4.2	0.9	2.0	1.6

23: Starbucks/Circle K Full & 20th St S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	2.0	3.5	0.3
Total Del/Veh (s)	1.7	3.4	30.8	51.9	6.6

25: Kwik Star Full & 20th St S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	1.5	0.1
Total Del/Veh (s)	1.1	1.7	15.0	2.5

29: 22nd Ave & Circle K RIRO Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	10.9	1.1	2.2	2.0

30: 22nd Ave & N Dev. Access Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.9	4.0	0.0	0.3	0.3
Total Del/Veh (s)	15.2	30.8	0.8	1.6	2.8

33: East Dev. Access & 20th St S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	2.4	1.6	0.5
Total Del/Veh (s)	2.3	1.6	8.7	8.8	3.5

Total Network Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	42.7

Intersection: 3: 22nd Ave & 20th St S

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	T
Maximum Queue (ft)	165	205	57	275	749	300	102	126	121	199	232	181
Average Queue (ft)	94	78	11	98	333	144	39	58	61	136	139	25
95th Queue (ft)	154	153	40	248	725	329	80	104	110	206	231	97
Link Distance (ft)		250			1007			122	122		201	201
Upstream Blk Time (%)		0			0		0	1	1	1	4	0
Queuing Penalty (veh)		1			4		0	1	1	0	19	1
Storage Bay Dist (ft)	150		200	250		275	185			190		
Storage Blk Time (%)	3	0		0	15	0	0	1		3	5	0
Queuing Penalty (veh)	9	1		0	71	1	0	0		3	13	1

Intersection: 3: 22nd Ave & 20th St S

Movement	SB
Directions Served	R
Maximum Queue (ft)	184
Average Queue (ft)	108
95th Queue (ft)	174
Link Distance (ft)	
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	195
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 7: SB Ramps & 20th St S

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (ft)	177	99	96	250	247	137
Average Queue (ft)	85	24	31	117	126	23
95th Queue (ft)	150	69	73	212	206	80
Link Distance (ft)	871			848	1036	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		185	250			150
Storage Blk Time (%)	0	0		0	5	0
Queuing Penalty (veh)	0	0		0	2	0

Intersection: 8: NB Ramps & 20th St S

Movement	EB	EB	WB	WB	NB	NB
Directions Served	L	T	T	R	L	TR
Maximum Queue (ft)	161	84	208	92	293	141
Average Queue (ft)	71	25	100	23	148	29
95th Queue (ft)	130	66	181	63	247	89
Link Distance (ft)		848	1461		1072	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	185			200		200
Storage Blk Time (%)	0		0		3	0
Queuing Penalty (veh)	0		0		2	0

Intersection: 11: 34th Ave & 20th St S

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	R
Maximum Queue (ft)	114	106	61	92	79	9	36	44
Average Queue (ft)	47	46	24	43	35	0	6	10
95th Queue (ft)	89	83	53	77	69	5	25	33
Link Distance (ft)		769		1839		1513		
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	200		150		200		200	200
Storage Blk Time (%)				0				
Queuing Penalty (veh)				0				

Intersection: 14: Ace Ave & 20th St S

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	16	55	71	60
Average Queue (ft)	1	21	28	27
95th Queue (ft)	7	51	59	53
Link Distance (ft)	1489			856
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		150	150	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 16: Chaparral Dr & 20th St S

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (ft)	26	96	117	294	212
Average Queue (ft)	2	31	15	152	59
95th Queue (ft)	15	68	133	327	200
Link Distance (ft)	1007		871	370	370
Upstream Blk Time (%)				4	3
Queuing Penalty (veh)				0	0
Storage Bay Dist (ft)		200			
Storage Blk Time (%)			1		
Queuing Penalty (veh)			1		

Intersection: 19: 22nd Ave & Canasta Ln

Movement	EB	EB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	TR	L	TR	L
Maximum Queue (ft)	47	52	34	62	35	6	44
Average Queue (ft)	17	15	10	27	5	0	8
95th Queue (ft)	39	38	32	51	23	5	31
Link Distance (ft)		370		505		1681	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	150		150		150		75
Storage Blk Time (%)							0
Queuing Penalty (veh)							0

Intersection: 22: 22nd Ave & Starbucks RIRO

Movement	EB	NB	NB
Directions Served	R	T	T
Maximum Queue (ft)	39	26	32
Average Queue (ft)	11	1	1
95th Queue (ft)	36	16	17
Link Distance (ft)	112	112	112
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 23: Starbucks/Circle K Full & 20th St S

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	58	30	36	38	68	68	105	126
Average Queue (ft)	17	1	7	3	18	20	50	39
95th Queue (ft)	46	16	29	20	51	51	102	110
Link Distance (ft)		242		250		239		233
Upstream Blk Time (%)								2
Queuing Penalty (veh)								0
Storage Bay Dist (ft)	75		50		100		100	
Storage Blk Time (%)	0	0	0	0	0	0	7	0
Queuing Penalty (veh)	1	0	1	0	0	0	4	0

Intersection: 25: Kwik Star Full & 20th St S

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	19	59	86	79
Average Queue (ft)	1	23	32	34
95th Queue (ft)	9	51	70	61
Link Distance (ft)	241			178
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		75	100	
Storage Blk Time (%)		0	1	0
Queuing Penalty (veh)		1	1	0

Intersection: 29: 22nd Ave & Circle K RIRO

Movement	EB	SB	SB
Directions Served	R	T	TR
Maximum Queue (ft)	76	146	48
Average Queue (ft)	33	19	3
95th Queue (ft)	63	97	32
Link Distance (ft)	183	467	467
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 30: 22nd Ave & N Dev. Access

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	TR	L	L	T	TR
Maximum Queue (ft)	87	80	77	64	5	23
Average Queue (ft)	38	36	25	26	0	1
95th Queue (ft)	71	65	61	56	3	12
Link Distance (ft)		408			1684	1684
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	150		150	150		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 33: East Dev. Access & 20th St S

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	TR	L	TR	L	TR
Maximum Queue (ft)	42	30	2	71	72	66	77
Average Queue (ft)	10	3	0	34	30	27	36
95th Queue (ft)	35	17	2	62	57	56	62
Link Distance (ft)			769		290		302
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	150	150		75		75	
Storage Blk Time (%)				1	0	0	0
Queuing Penalty (veh)				0	0	0	0

Network Summary

Network wide Queuing Penalty: 140

Intersection: 33: East Dev. Access & 20th St S

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 0

Appendix B: I-29 Ramp Terminal Intersection Year of Need Analysis Reports

Intersection	
Int Delay, s/veh	10.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	196	371	0	0	186	47	191	0	63	0	0	0
Future Vol, veh/h	196	371	0	0	186	47	191	0	63	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	185	-	-	-	-	200	0	-	200	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	218	412	0	0	207	52	212	0	70	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	259	0	-	-	-	0	1054	1107	412
Stage 1	-	-	-	-	-	-	848	848	-
Stage 2	-	-	-	-	-	-	207	259	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	1300	-	0	0	-	-	249	209	638
Stage 1	-	-	0	0	-	-	418	376	-
Stage 2	-	-	0	0	-	-	826	692	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1300	-	-	-	-	-	~ 207	0	638
Mov Cap-2 Maneuver	-	-	-	-	-	-	284	0	-
Stage 1	-	-	-	-	-	-	348	0	-
Stage 2	-	-	-	-	-	-	826	0	-

Approach	EB	WB	NB
HCM Control Delay, s/v	2.88	0	38.34
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	284	638	1300	-	-	-
HCM Lane V/C Ratio	0.746	0.11	0.168	-	-	-
HCM Control Delay (s/veh)	47.2	11.3	8.3	-	-	-
HCM Lane LOS	E	B	A	-	-	-
HCM 95th %tile Q(veh)	5.5	0.4	0.6	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	174	286	0	0	139	35	169	0	45	0	0	0
Future Vol, veh/h	174	286	0	0	139	35	169	0	45	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	185	-	-	-	-	200	0	-	200	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	193	318	0	0	154	39	188	0	50	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	193	0	-	-	-	0	859	898	318
Stage 1	-	-	-	-	-	-	704	704	-
Stage 2	-	-	-	-	-	-	154	193	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	1374	-	0	0	-	-	326	278	720
Stage 1	-	-	0	0	-	-	488	438	-
Stage 2	-	-	0	0	-	-	871	739	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1374	-	-	-	-	-	280	0	720
Mov Cap-2 Maneuver	-	-	-	-	-	-	350	0	-
Stage 1	-	-	-	-	-	-	420	0	-
Stage 2	-	-	-	-	-	-	871	0	-

Approach	EB	WB	NB
HCM Control Delay, s/v	3.04	0	23.19
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	350	720	1374	-	-	-
HCM Lane V/C Ratio	0.537	0.069	0.141	-	-	-
HCM Control Delay (s/veh)	26.6	10.4	8	-	-	-
HCM Lane LOS	D	B	A	-	-	-
HCM 95th %tile Q(veh)	3	0.2	0.5	-	-	-

Year of Need (NB LT LOS D)
Existing configuration; 2035 traffic volumes

Intersection	
Int Delay, s/veh	4.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	715	205	45	470	155	65
Future Vol, veh/h	715	205	45	470	155	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	185	250	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	794	228	50	522	172	72

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1022	0	1417	794
Stage 1	-	-	-	-	794	-
Stage 2	-	-	-	-	622	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	675	-	~ 150	386
Stage 1	-	-	-	-	443	-
Stage 2	-	-	-	-	533	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	675	-	~ 139	386
Mov Cap-2 Maneuver	-	-	-	-	276	-
Stage 1	-	-	-	-	443	-
Stage 2	-	-	-	-	494	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.94	31.17
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	276	386	-	-	675	-
HCM Lane V/C Ratio	0.623	0.187	-	-	0.074	-
HCM Control Delay (s/veh)	37.3	16.5	-	-	10.8	-
HCM Lane LOS	E	C	-	-	B	-
HCM 95th %tile Q(veh)	3.8	0.7	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	3.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	620	187	37	408	138	53
Future Vol, veh/h	620	187	37	408	138	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	185	250	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	689	208	41	453	153	59

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	897	0	1224	689
Stage 1	-	-	-	-	689	-
Stage 2	-	-	-	-	536	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	753	-	197	444
Stage 1	-	-	-	-	497	-
Stage 2	-	-	-	-	585	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	753	-	186	444
Mov Cap-2 Maneuver	-	-	-	-	323	-
Stage 1	-	-	-	-	497	-
Stage 2	-	-	-	-	553	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.84	22.61
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	323	444	-	-	753	-
HCM Lane V/C Ratio	0.474	0.133	-	-	0.055	-
HCM Control Delay (s/veh)	25.8	14.3	-	-	10.1	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	2.4	0.5	-	-	0.2	-

Intersection	
Int Delay, s/veh	9.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	143	160	0	0	343	64	222	0	33	0	0	0
Future Vol, veh/h	143	160	0	0	343	64	222	0	33	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	185	-	-	-	-	200	0	-	200	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	159	178	0	0	381	71	247	0	37	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	452	0	-	-	-	0	877	948	178
Stage 1	-	-	-	-	-	-	496	496	-
Stage 2	-	-	-	-	-	-	381	452	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	4.027	3.327
Pot Cap-1 Maneuver	1103	-	0	0	-	-	318	260	863
Stage 1	-	-	0	0	-	-	610	544	-
Stage 2	-	-	0	0	-	-	688	569	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1103	-	-	-	-	-	272	0	863
Mov Cap-2 Maneuver	-	-	-	-	-	-	364	0	-
Stage 1	-	-	-	-	-	-	522	0	-
Stage 2	-	-	-	-	-	-	688	0	-

Approach	EB	WB	NB
HCM Control Delay, s/v	4.16	0	30.21
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	364	863	1103	-	-	-
HCM Lane V/C Ratio	0.677	0.043	0.144	-	-	-
HCM Control Delay (s/veh)	33.3	9.4	8.8	-	-	-
HCM Lane LOS	D	A	A	-	-	-
HCM 95th %tile Q(veh)	4.8	0.1	0.5	-	-	-

Year of Need (approach LOS D)
Year of Need (NB LT LOS D)
Existing configuration; 2040 traffic volumes

Intersection	
Int Delay, s/veh	4.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	276	194	41	524	203	27
Future Vol, veh/h	276	194	41	524	203	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	185	250	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	307	216	46	582	226	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	522	0	980	307
Stage 1	-	-	-	-	307	-
Stage 2	-	-	-	-	673	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1039	-	276	731
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	505	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1039	-	264	731
Mov Cap-2 Maneuver	-	-	-	-	378	-
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	483	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.63	25.6
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	378	731	-	-	1039	-
HCM Lane V/C Ratio	0.597	0.041	-	-	0.044	-
HCM Control Delay (s/veh)	27.7	10.1	-	-	8.6	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	3.7	0.1	-	-	0.1	-

Year of Need (approach LOS D)
Year of Need (NB LT LOS D)
Existing configuration; 2040 traffic volumes

Traffic Signal Warrant Analysis Workbook

Year 2045 Volumes

10/14/2024

STUDY AND ANALYSIS INFORMATION

Municipality:	SDDOT	**Analysis Date:**	10/14/2024
County:		**Conducted By:**	HDR
PennDOT Engineering District:		**Agency/Company Name:**	HDR

Analysis Information

Data Collection Date:	5/14/2024
Day of the Week:	Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Major Street Information

Major Street Name and Route Number:	20th Street S
Major Street Approach #1 Direction:	E-Bound
Major Street Approach #2 Direction:	W-Bound

Number of Lanes for Moving Traffic on Each Major Street Approach:	1	**LANE(S)**
Speed Limit or 85th Percentile Speed on the Major Street:	35	**MPH**

Minor Street Information

Minor Street Name and Route Number:	I-29 NB RTI
Minor Street Approach #1 Direction:	N-Bound
Minor Street Approach #2 Direction:	S-Bound

Number of Lanes for Moving Traffic on Each Minor Street Approach:	1	**LANE(S)**

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Met?
Warrant 1, Eight-Hour Vehicular Volume	Yes	No
Warrant 2, Four-Hour Vehicular Volume	Yes	Yes
Warrant 3, Peak Hour	Yes	No
Warrant 4, Pedestrian Volume	No	N/A
Warrant 5, School Crossing	No	N/A
Warrant 6, Coordinated Signal System	No	N/A
Warrant 7, Crash Experience	No	N/A
Warrant 8, Roadway Network	No	N/A
Warrant 9, Intersection Near a Grade Crossing	No	N/A
Warrant PA-1, ADT Volume Warrant	No	N/A
Warrant PA-2, Midblock and Trail Crossings	No	N/A

MUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No

Combination of Conditions A and B Necessary?*: No

**Only applicable for Warrant 1 if after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. See Section 4C.02 of the 2009 MUTCD for application.*

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or More	1	600	480	420	336	150	120	105	84
2 or More	2 or More	600	480	420	336	200	160	140	112
1	2 or More	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or More	1	900	720	630	504	75	60	53	42
2 or More	2 or More	900	720	630	504	100	80	70	56
1	2 or More	750	600	525	420	100	80	70	56

Condition A Evaluation

Number of Unique Hours Met: 6 **Condition A Satisfied?** No

Condition B Evaluation

Number of Unique Hours Met: 4 **Condition B Satisfied?** No

Combination of Condition A and Condition B Evaluation

Number of Unique Hours Met for Condition A: N/A

Number of Unique Hours Met for Condition B: N/A

Combination of Condition A and Condition B Satisfied? N/A

MUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-1
4

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No

Hourly Vehicular Volume			
Hour Interval Beginning At	Major Street Combined Vehicles Per Hour (VPH)	Highest Minor Street Approach Vehicles Per Hour (VPH)	Hour Met?
12:00 AM	19.582	21.324	
12:15 AM	28.331	17.77	
12:30 AM	21.682	19.547	
12:45 AM	17.847	17.77	
1:00 AM	22.396	14.216	
1:15 AM	24.845	10.662	
1:30 AM	31.494	7.108	
1:45 AM	37.064	7.108	
2:00 AM	32.515	7.108	
2:15 AM	47.913	8.885	
2:30 AM	41.264	7.108	
2:45 AM	31.145	7.108	
3:00 AM	35.694	8.885	
3:15 AM	6.284	5.331	
3:30 AM	27.966	7.108	
3:45 AM	38.085	12.439	
4:00 AM	54.992	15.993	
4:15 AM	82.874	24.878	
4:30 AM	94.712	33.763	
4:45 AM	196.648	46.202	
5:00 AM	271.351	51.533	
5:15 AM	312.625	71.08	
5:30 AM	371.72	90.627	
5:45 AM	370.848	111.951	
6:00 AM	443.814	147.491	
6:15 AM	471.606	143.937	
6:30 AM	657.601	163.484	
6:45 AM	887.141	177.7	Met
7:00 AM	1084.231	193.693	Met
7:15 AM	1144.57	209.686	Met
7:30 AM	1007.115	188.362	Met
7:45 AM	802.158	175.923	Met
8:00 AM	568.31	140.383	
8:15 AM	530.389	113.728	
8:30 AM	464.367	95.958	
8:45 AM	446.794	88.85	
9:00 AM	450.674	87.073	
9:15 AM	449.569	92.404	
9:30 AM	465.894	95.958	
9:45 AM	472.821	87.073	
10:00 AM	453.449	94.181	
10:15 AM	437.127	104.843	
10:30 AM	493.408	122.613	
10:45 AM	514.951	120.836	
11:00 AM	526.233	119.059	
11:15 AM	580.007	115.938	

Hourly Vehicular Volume			
Hour Interval Beginning At	Major Street Combined Vehicles Per Hour (VPH)	Highest Minor Street Approach Vehicles Per Hour (VPH)	Hour Met?
11:30 AM	553.647	109.347	
11:45 AM	546.144	106.478	

Hourly Vehicular Volume			
Hour Interval Beginning At	Major Street Combined Vehicles Per Hour (VPH)	Highest Minor Street Approach Vehicles Per Hour (VPH)	Hour Met?
12:00 PM	601.928	104.966	
12:15 PM	584.275	121.896	
12:30 PM	576.266	121.896	
12:45 PM	551.19	133.747	
1:00 PM	528.385	126.975	
1:15 PM	519.841	110.045	
1:30 PM	512.09	115.124	
1:45 PM	527.081	135.44	
2:00 PM	515.962	150.677	
2:15 PM	539.358	160.835	
2:30 PM	579.267	170.993	
2:45 PM	580.133	157.449	
3:00 PM	577.035	152.37	
3:15 PM	631.549	164.221	
3:30 PM	683.73	172.686	
3:45 PM	911.885	187.923	Met
4:00 PM	939.636	226.862	Met
4:15 PM	1002.135	264.108	Met
4:30 PM	1041.965	301.354	Met
4:45 PM	807.148	308.126	Met
5:00 PM	769.709	291.196	Met
5:15 PM	582.689	242.099	Met
5:30 PM	467.857	203.16	
5:45 PM	428.142	172.686	
6:00 PM	397.107	154.063	
6:15 PM	418.251	137.133	
6:30 PM	382.195	115.124	
6:45 PM	370.8	108.352	
7:00 PM	340.816	84.65	
7:15 PM	300.82	82.957	
7:30 PM	260.029	77.878	
7:45 PM	220.296	79.571	
8:00 PM	184.332	88.036	
8:15 PM	138.404	91.422	
8:30 PM	134.212	89.729	
8:45 PM	153.802	76.185	
9:00 PM	138.202	74.492	
9:15 PM	145.006	59.255	
9:30 PM	128.146	54.176	
9:45 PM	78.296	47.404	
10:00 PM	57.84	32.167	
10:15 PM	33.352	27.088	
10:30 PM	20.973	18.623	
10:45 PM	29.357	18.623	
11:00 PM	27.341	20.316	

Traffic Signal Warrant Analysis Workbook

Year 2050 Volumes

10/14/2024

STUDY AND ANALYSIS INFORMATION

Municipality:	SDDOT	**Analysis Date:**	10/14/2024
County:		**Conducted By:**	HDR
PennDOT Engineering District:		**Agency/Company Name:**	HDR

Analysis Information

Data Collection Date:	5/7/2022
Day of the Week:	Tuesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Major Street Information

Major Street Name and Route Number:	20th Street S
Major Street Approach #1 Direction:	E-Bound
Major Street Approach #2 Direction:	W-Bound

Number of Lanes for Moving Traffic on Each Major Street Approach:	1	**LANE(S)**
Speed Limit or 85th Percentile Speed on the Major Street:	35	**MPH**

Minor Street Information

Minor Street Name and Route Number:	I-29 SB Off-Ramp
Minor Street Approach #1 Direction:	N-Bound
Minor Street Approach #2 Direction:	S-Bound

Number of Lanes for Moving Traffic on Each Minor Street Approach:	1	**LANE(S)**

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Met?
Warrant 1, Eight-Hour Vehicular Volume	**Yes**	**No**
Warrant 2, Four-Hour Vehicular Volume	**Yes**	**Yes**
Warrant 3, Peak Hour	**Yes**	**No**
Warrant 4, Pedestrian Volume	**No**	**N/A**
Warrant 5, School Crossing	**No**	**N/A**
Warrant 6, Coordinated Signal System	**No**	**N/A**
Warrant 7, Crash Experience	**No**	**N/A**
Warrant 8, Roadway Network	**No**	**N/A**
Warrant 9, Intersection Near a Grade Crossing	**No**	**N/A**
Warrant PA-1, ADT Volume Warrant	**No**	**N/A**
Warrant PA-2, Midblock and Trail Crossings	**No**	**N/A**

MUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No

Combination of Conditions A and B Necessary?*: No

**Only applicable for Warrant 1 if after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. See Section 4C.02 of the 2009 MUTCD for application.*

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or More	1	600	480	420	336	150	120	105	84
2 or More	2 or More	600	480	420	336	200	160	140	112
1	2 or More	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or More	1	900	720	630	504	75	60	53	42
2 or More	2 or More	900	720	630	504	100	80	70	56
1	2 or More	750	600	525	420	100	80	70	56

Condition A Evaluation

Number of Unique Hours Met: 3 **Condition A Satisfied?** No

Condition B Evaluation

Number of Unique Hours Met: 6 **Condition B Satisfied?** No

Combination of Condition A and Condition B Evaluation

Number of Unique Hours Met for Condition A: N/A

Number of Unique Hours Met for Condition B: N/A

Combination of Condition A and Condition B Satisfied? N/A

MUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-1
4

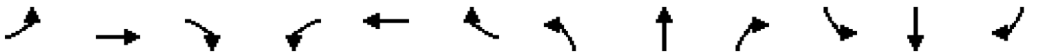
Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No

Hourly Vehicular Volume			
Hour Interval Beginning At	Major Street Combined Vehicles Per Hour (VPH)	Highest Minor Street Approach Vehicles Per Hour (VPH)	Hour Met?
12:00 AM	0.163888889	11.89	
12:15 AM	3.963222222	9.512	
12:30 AM	4.046555556	7.134	
12:45 AM	7.845888889	2.378	
1:00 AM	11.64522222	2.378	
1:15 AM	25.68455556	2.378	
1:30 AM	25.76788889	4.756	
1:45 AM	49.13922222	2.378	
2:00 AM	59.46255556	2.378	
2:15 AM	49.30588889	4.756	
2:30 AM	53.10522222	2.378	
2:45 AM	26.18455556	4.756	
3:00 AM	16.02788889	4.756	
3:15 AM	8.679222222	4.756	
3:30 AM	5.046555556	4.756	
3:45 AM	29.32588889	2.378	
4:00 AM	43.36522222	4.756	
4:15 AM	105.7965556	7.134	
4:30 AM	185.8998889	9.512	
4:45 AM	345.2832222	9.512	
5:00 AM	469.1545556	11.89	
5:15 AM	540.9178889	19.024	
5:30 AM	647.1172222	26.158	
5:45 AM	671.3125556	33.292	
6:00 AM	935.9038889	52.316	
6:15 AM	1190.087222	59.45	
6:30 AM	1411.902556	83.23	Met
6:45 AM	1700.773889	118.9	Met
7:00 AM	1815.565222	145.058	Met
7:15 AM	1862.476556	156.948	Met
7:30 AM	1630.587889	145.058	Met
7:45 AM	1268.303222	114.144	Met
8:00 AM	863.9825556	83.23	
8:15 AM	571.4778889	78.474	
8:30 AM	522.1772222	78.474	
8:45 AM	511.1125556	85.608	
9:00 AM	568.0958889	80.852	
9:15 AM	546.7072222	80.852	
9:30 AM	537.5425556	76.096	
9:45 AM	544.1498889	64.206	
10:00 AM	530.1932222	68.962	
10:15 AM	555.5485556	66.584	
10:30 AM	599.3998889	78.474	
10:45 AM	600.3912222	87.986	
11:00 AM	564.2225556	90.364	
11:15 AM	538.5061667	79.226	

Hourly Vehicular Volume			
Hour Interval Beginning At	Major Street Combined Vehicles Per Hour (VPH)	Highest Minor Street Approach Vehicles Per Hour (VPH)	Hour Met?
11:30 AM	539.8929444	70.556	
11:45 AM	543.8028889	73.776	

Hourly Vehicular Volume			
Hour Interval Beginning At	Major Street Combined Vehicles Per Hour (VPH)	Highest Minor Street Approach Vehicles Per Hour (VPH)	Hour Met?
12:00 PM	589.476	72.24	
12:15 PM	665.956	75.852	
12:30 PM	651.064	68.628	
12:45 PM	649.128	68.628	
1:00 PM	644.862	65.016	
1:15 PM	622.316	68.628	
1:30 PM	618.14	65.016	
1:45 PM	627.202	66.822	
2:00 PM	675.91	66.822	
2:15 PM	688.04	65.016	
2:30 PM	739.258	86.688	
2:45 PM	793.382	84.882	
3:00 PM	797.564	102.942	
3:15 PM	891.24	115.584	
3:30 PM	1024.052	124.614	Met
3:45 PM	1188.616	162.54	Met
4:00 PM	1330.374	173.376	Met
4:15 PM	1376.99	222.138	Met
4:30 PM	1373.718	245.616	Met
4:45 PM	1211.604	223.944	Met
5:00 PM	1112.59	213.108	Met
5:15 PM	974.978	162.54	Met
5:30 PM	801.814	119.196	
5:45 PM	752.684	102.942	
6:00 PM	630.462	86.688	
6:15 PM	558.194	81.27	
6:30 PM	494.788	75.852	
6:45 PM	436.034	74.046	
7:00 PM	360.932	74.046	
7:15 PM	321.102	55.986	
7:30 PM	317.306	61.404	
7:45 PM	284.896	55.986	
8:00 PM	293.058	61.404	
8:15 PM	259.764	66.822	
8:30 PM	234.242	52.374	
8:45 PM	245.434	43.344	
9:00 PM	214.972	23.478	
9:15 PM	230.11	21.672	
9:30 PM	210.89	16.254	
9:45 PM	175.892	18.06	
10:00 PM	164.496	19.866	
10:15 PM	146.084	12.642	
10:30 PM	124.59	18.06	
10:45 PM	130.242	12.642	
11:00 PM	137.572	7.224	

Appendix C: 20th Street S & 22nd Avenue Year of Need Analysis Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	284	404	27	36	232	199	32	195	75	229	82	91
Future Volume (veh/h)	284	404	27	36	232	199	32	195	75	229	82	91
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758
Adj Flow Rate, veh/h	316	449	30	40	258	221	36	217	83	254	91	101
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	447	617	41	259	462	392	369	248	95	337	546	672
Arrive On Green	0.14	0.38	0.38	0.03	0.26	0.26	0.02	0.21	0.21	0.13	0.31	0.31
Sat Flow, veh/h	1674	1629	109	1674	1758	1490	1674	1211	463	1674	1758	1490
Grp Volume(v), veh/h	316	0	479	40	258	221	36	0	300	254	91	101
Grp Sat Flow(s),veh/h/ln	1674	0	1738	1674	1758	1490	1674	0	1674	1674	1758	1490
Q Serve(g_s), s	10.9	0.0	19.3	1.4	10.4	10.5	1.4	0.0	14.2	9.4	3.1	3.3
Cycle Q Clear(g_c), s	10.9	0.0	19.3	1.4	10.4	10.5	1.4	0.0	14.2	9.4	3.1	3.3
Prop In Lane	1.00		0.06	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	447	0	658	259	462	392	369	0	343	337	546	672
V/C Ratio(X)	0.71	0.00	0.73	0.15	0.56	0.56	0.10	0.00	0.87	0.75	0.17	0.15
Avail Cap(c_a), veh/h	447	0	658	281	462	392	394	0	410	337	589	709
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.9	0.0	21.8	21.9	26.0	26.1	24.9	0.0	31.5	21.8	20.5	13.2
Incr Delay (d2), s/veh	4.3	0.0	6.9	0.1	4.8	5.8	0.0	0.0	16.3	8.3	0.1	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.8	0.0	13.4	1.0	8.3	7.5	1.0	0.0	11.4	7.6	2.2	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	22.2	0.0	28.7	22.0	30.8	31.9	24.9	0.0	47.8	30.2	20.6	13.3
LnGrp LOS	C		C	C	C	C	C		D	C	C	B
Approach Vol, veh/h		795			519			336			446	
Approach Delay, s/veh		26.1			30.6			45.3			24.4	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	37.5	6.4	31.4	16.0	28.0	15.0	22.8
Change Period (Y+Rc), s	4.5	6.5	4.5	6.0	4.5	6.5	4.5	6.0
Max Green Setting (Gmax), s	3.1	29.9	3.1	27.4	11.5	21.5	10.5	20.0
Max Q Clear Time (g_c+I1), s	3.4	21.3	3.4	5.3	12.9	12.5	11.4	16.2
Green Ext Time (p_c), s	0.0	1.9	0.0	0.7	0.0	1.5	0.0	0.6

Intersection Summary	
HCM 7th Control Delay, s/veh	30.0
HCM 7th LOS	C

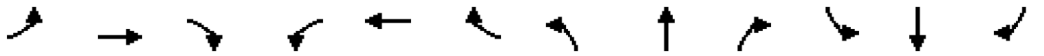
Notes

User approved changes to right turn type.

Year of Need - maintains LOS C
Existing configuration; 2040 traffic volumes

HCM 7th Signalized Intersection Summary
3: 22nd Ave & 20th St S

10/15/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	307	464	31	45	274	227	36	208	93	270	93	100
Future Volume (veh/h)	307	464	31	45	274	227	36	208	93	270	93	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758
Adj Flow Rate, veh/h	341	516	34	50	304	252	40	231	103	300	103	111
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	402	592	39	197	452	383	387	257	114	325	567	686
Arrive On Green	0.14	0.36	0.36	0.03	0.26	0.26	0.03	0.22	0.22	0.13	0.32	0.32
Sat Flow, veh/h	1674	1631	107	1674	1758	1490	1674	1152	514	1674	1758	1490
Grp Volume(v), veh/h	341	0	550	50	304	252	40	0	334	300	103	111
Grp Sat Flow(s),veh/h/ln	1674	0	1739	1674	1758	1490	1674	0	1665	1674	1758	1490
Q Serve(g_s), s	11.5	0.0	24.7	1.8	13.0	12.7	1.5	0.0	16.3	10.5	3.5	3.6
Cycle Q Clear(g_c), s	11.5	0.0	24.7	1.8	13.0	12.7	1.5	0.0	16.3	10.5	3.5	3.6
Prop In Lane	1.00		0.06	1.00		1.00	1.00		0.31	1.00		1.00
Lane Grp Cap(c), veh/h	402	0	631	197	452	383	387	0	371	325	567	686
V/C Ratio(X)	0.85	0.00	0.87	0.25	0.67	0.66	0.10	0.00	0.90	0.92	0.18	0.16
Avail Cap(c_a), veh/h	402	0	631	206	452	383	406	0	398	325	576	693
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	0.0	24.8	23.4	27.9	27.8	24.2	0.0	31.6	23.6	20.4	13.2
Incr Delay (d2), s/veh	14.7	0.0	15.3	0.2	7.8	8.6	0.0	0.0	21.9	30.3	0.2	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.1	0.0	17.8	1.3	10.3	8.9	1.1	0.0	13.3	11.2	2.5	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	35.7	0.0	40.1	23.7	35.7	36.3	24.2	0.0	53.5	53.8	20.5	13.3
LnGrp LOS	D		D	C	D	D	C		D	D	C	B
Approach Vol, veh/h		891			606			374			514	
Approach Delay, s/veh		38.4			35.0			50.4			38.4	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	36.9	6.6	33.0	16.0	28.0	15.0	24.6
Change Period (Y+Rc), s	4.5	6.5	4.5	6.0	4.5	6.5	4.5	6.0
Max Green Setting (Gmax), s	3.1	29.9	3.1	27.4	11.5	21.5	10.5	20.0
Max Q Clear Time (g_c+I1), s	3.8	26.7	3.5	5.6	13.5	15.0	12.5	18.3
Green Ext Time (p_c), s	0.0	1.1	0.0	0.8	0.0	1.5	0.0	0.3

Intersection Summary	
HCM 7th Control Delay, s/veh	39.4
HCM 7th LOS	D

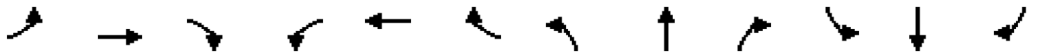
Notes

User approved changes to right turn type.

Year of Need - LOS D
Existing configuration; 2045 traffic volumes

HCM 7th Signalized Intersection Summary
3: 22nd Ave & 20th St S

10/15/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	202	257	47	86	457	316	57	161	41	246	242	339
Future Volume (veh/h)	202	257	47	86	457	316	57	161	41	246	242	339
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758
Adj Flow Rate, veh/h	224	286	52	96	508	351	63	179	46	273	269	377
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	276	514	93	394	567	480	262	207	53	365	447	510
Arrive On Green	0.09	0.35	0.35	0.06	0.32	0.32	0.04	0.15	0.15	0.14	0.25	0.25
Sat Flow, veh/h	1674	1447	263	1674	1758	1490	1674	1349	347	1674	1758	1490
Grp Volume(v), veh/h	224	0	338	96	508	351	63	0	225	273	269	377
Grp Sat Flow(s),veh/h/ln	1674	0	1711	1674	1758	1490	1674	0	1695	1674	1758	1490
Q Serve(g_s), s	6.5	0.0	11.7	2.8	20.2	15.4	2.3	0.0	9.5	9.7	9.9	16.4
Cycle Q Clear(g_c), s	6.5	0.0	11.7	2.8	20.2	15.4	2.3	0.0	9.5	9.7	9.9	16.4
Prop In Lane	1.00		0.15	1.00		1.00	1.00		0.20	1.00		1.00
Lane Grp Cap(c), veh/h	276	0	607	394	567	480	262	0	261	365	447	510
V/C Ratio(X)	0.81	0.00	0.56	0.24	0.90	0.73	0.24	0.00	0.86	0.75	0.60	0.74
Avail Cap(c_a), veh/h	276	0	607	431	567	480	293	0	261	365	447	510
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.7	0.0	19.1	15.7	23.7	22.1	24.7	0.0	30.3	21.2	24.1	21.3
Incr Delay (d2), s/veh	15.5	0.0	3.7	0.1	19.4	9.4	0.2	0.0	24.5	7.4	2.3	5.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.3	0.0	8.5	1.8	16.1	10.2	1.6	0.0	9.3	7.6	7.4	10.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	34.2	0.0	22.7	15.8	43.1	31.5	24.9	0.0	54.8	28.6	26.4	26.9
LnGrp LOS	C		C	B	D	C	C		D	C	C	C
Approach Vol, veh/h		562			955			288			919	
Approach Delay, s/veh		27.3			36.1			48.3			27.2	
Approach LOS		C			D			D			C	

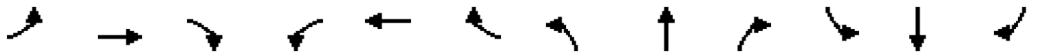
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	32.6	7.6	24.7	11.0	30.2	15.0	17.3
Change Period (Y+Rc), s	4.5	6.5	4.5	6.0	4.5	6.5	4.5	6.0
Max Green Setting (Gmax), s	5.7	24.5	4.5	17.3	6.5	23.7	10.5	11.3
Max Q Clear Time (g_c+I1), s	4.8	13.7	4.3	18.4	8.5	22.2	11.7	11.5
Green Ext Time (p_c), s	0.0	1.4	0.0	0.0	0.0	0.7	0.0	0.0

Intersection Summary	
HCM 7th Control Delay, s/veh	32.6
HCM 7th LOS	C

Notes

User approved changes to right turn type.

Year of Need - maintains LOS C
Existing configuration; 2045 traffic volumes



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	290	55	100	515	360	65	175	50	280	260	365
Future Volume (veh/h)	220	290	55	100	515	360	65	175	50	280	260	365
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758	1758
Adj Flow Rate, veh/h	244	322	61	111	572	400	72	194	56	311	289	406
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	247	527	100	384	622	527	238	214	62	312	405	455
Arrive On Green	0.07	0.37	0.37	0.06	0.35	0.35	0.05	0.16	0.16	0.12	0.23	0.23
Sat Flow, veh/h	1674	1437	272	1674	1758	1490	1674	1311	379	1674	1758	1490
Grp Volume(v), veh/h	244	0	383	111	572	400	72	0	250	311	289	406
Grp Sat Flow(s),veh/h/ln	1674	0	1709	1674	1758	1490	1674	0	1690	1674	1758	1490
Q Serve(g_s), s	5.5	0.0	13.4	3.1	22.9	17.4	2.6	0.0	10.7	8.5	11.1	17.0
Cycle Q Clear(g_c), s	5.5	0.0	13.4	3.1	22.9	17.4	2.6	0.0	10.7	8.5	11.1	17.0
Prop In Lane	1.00		0.16	1.00		1.00	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	247	0	627	384	622	527	238	0	276	312	405	455
V/C Ratio(X)	0.99	0.00	0.61	0.29	0.92	0.76	0.30	0.00	0.91	1.00	0.71	0.89
Avail Cap(c_a), veh/h	247	0	627	395	622	527	282	0	276	312	405	455
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.8	0.0	19.0	14.6	22.8	21.0	24.2	0.0	30.2	25.3	26.0	24.4
Incr Delay (d2), s/veh	53.2	0.0	4.4	0.2	21.0	9.9	0.3	0.0	31.0	50.3	5.8	19.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.1	0.0	9.5	1.9	17.9	11.3	1.8	0.0	10.6	9.7	8.7	13.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	75.0	0.0	23.4	14.8	43.8	30.8	24.4	0.0	61.2	75.6	31.8	43.8
LnGrp LOS	E		C	B	D	C	C		E	E	C	D
Approach Vol, veh/h		627			1083			322			1006	
Approach Delay, s/veh		43.5			36.0			53.0			50.2	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	33.5	8.0	23.0	10.0	32.5	13.0	18.0
Change Period (Y+Rc), s	4.5	6.5	4.5	6.0	4.5	6.5	4.5	6.0
Max Green Setting (Gmax), s	5.0	26.5	5.5	15.0	5.5	26.0	8.5	12.0
Max Q Clear Time (g_c+I1), s	5.1	15.4	4.6	19.0	7.5	24.9	10.5	12.7
Green Ext Time (p_c), s	0.0	1.7	0.0	0.0	0.0	0.6	0.0	0.0

Intersection Summary	
HCM 7th Control Delay, s/veh	44.0
HCM 7th LOS	D

Notes

User approved changes to right turn type.

Year of Need - LOS D
Existing configuration; 2050 traffic volumes

Appendix D: 20th Street S & 34th Avenue Year of Need Analysis Reports

Intersection	
Int Delay, s/veh	44.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	250	65	140	55	95	55	130	90	40	40	60	135
Future Vol, veh/h	250	65	140	55	95	55	130	90	40	40	60	135
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	150	-	-	200	-	-	200	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	278	72	156	61	106	61	144	100	44	44	67	150

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	597	589	67	603	717	122	217	0	0	144	0	0
Stage 1	156	156	-	411	411	-	-	-	-	-	-	-
Stage 2	442	433	-	192	306	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	413	419	994	410	354	926	1347	-	-	1432	-	-
Stage 1	844	767	-	616	593	-	-	-	-	-	-	-
Stage 2	593	580	-	808	660	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 229	363	994	246	306	926	1347	-	-	1432	-	-
Mov Cap-2 Maneuver	~ 229	363	-	246	306	-	-	-	-	-	-	-
Stage 1	818	743	-	550	529	-	-	-	-	-	-	-
Stage 2	396	518	-	596	640	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	100.62	21.11	4	1.29
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1347	-	-	229	641	246	406	1432	-	-
HCM Lane V/C Ratio	0.107	-	-	1.21	0.356	0.248	0.41	0.031	-	-
HCM Control Delay (s/veh)	8	-	-	171.9	13.7	24.4	19.9	7.6	-	-
HCM Lane LOS	A	-	-	F	B	C	C	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	13.7	1.6	1	2	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	44.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	250	65	140	55	95	55	130	90	40	40	60	135
Future Vol, veh/h	250	65	140	55	95	55	130	90	40	40	60	135
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	150	-	-	200	-	-	200	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	278	72	156	61	106	61	144	100	44	44	67	150

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	597	589	67	603	717	122	217	0	0	144	0	0
Stage 1	156	156	-	411	411	-	-	-	-	-	-	-
Stage 2	442	433	-	192	306	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	413	419	994	410	354	926	1347	-	-	1432	-	-
Stage 1	844	767	-	616	593	-	-	-	-	-	-	-
Stage 2	593	580	-	808	660	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 229	363	994	246	306	926	1347	-	-	1432	-	-
Mov Cap-2 Maneuver	~ 229	363	-	246	306	-	-	-	-	-	-	-
Stage 1	818	743	-	550	529	-	-	-	-	-	-	-
Stage 2	396	518	-	596	640	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	100.62	21.11	4	1.29
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1347	-	-	229	641	246	406	1432	-	-
HCM Lane V/C Ratio	0.107	-	-	1.21	0.356	0.248	0.41	0.031	-	-
HCM Control Delay (s/veh)	8	-	-	171.9	13.7	24.4	19.9	7.6	-	-
HCM Lane LOS	A	-	-	F	B	C	C	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	13.7	1.6	1	2	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Year of Need - Overall intersection LOS E, EB Approach LOS F
Build-out configuration; 2045 traffic volumes

Intersection	
Int Delay, s/veh	16.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	219	53	114	45	78	45	107	79	33	33	50	114
Future Vol, veh/h	219	53	114	45	78	45	107	79	33	33	50	114
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	150	-	-	200	-	-	200	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	243	59	127	50	87	50	119	88	37	37	56	127

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	498	491	56	502	599	106	182	0	0	124	0	0
Stage 1	129	129	-	344	344	-	-	-	-	-	-	-
Stage 2	369	362	-	158	256	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	481	477	1008	478	414	945	1387	-	-	1456	-	-
Stage 1	872	788	-	669	635	-	-	-	-	-	-	-
Stage 2	649	623	-	842	694	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	319	425	1008	326	369	945	1387	-	-	1456	-	-
Mov Cap-2 Maneuver	319	425	-	326	369	-	-	-	-	-	-	-
Stage 1	850	768	-	612	581	-	-	-	-	-	-	-
Stage 2	478	570	-	662	677	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	30.68	16.27	3.83	1.26
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1387	-	-	319	702	326	475	1456	-	-
HCM Lane V/C Ratio	0.086	-	-	0.763	0.264	0.153	0.288	0.025	-	-
HCM Control Delay (s/veh)	7.8	-	-	45	12	18	15.6	7.5	-	-
HCM Lane LOS	A	-	-	E	B	C	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	5.9	1.1	0.5	1.2	0.1	-	-

Year of Need - Acceptable Operations
Build-out configuration; 2045 traffic volumes

Appendix E: 20th Street S & 22nd Avenue West Leg – Potential Turn Lane Dimensions

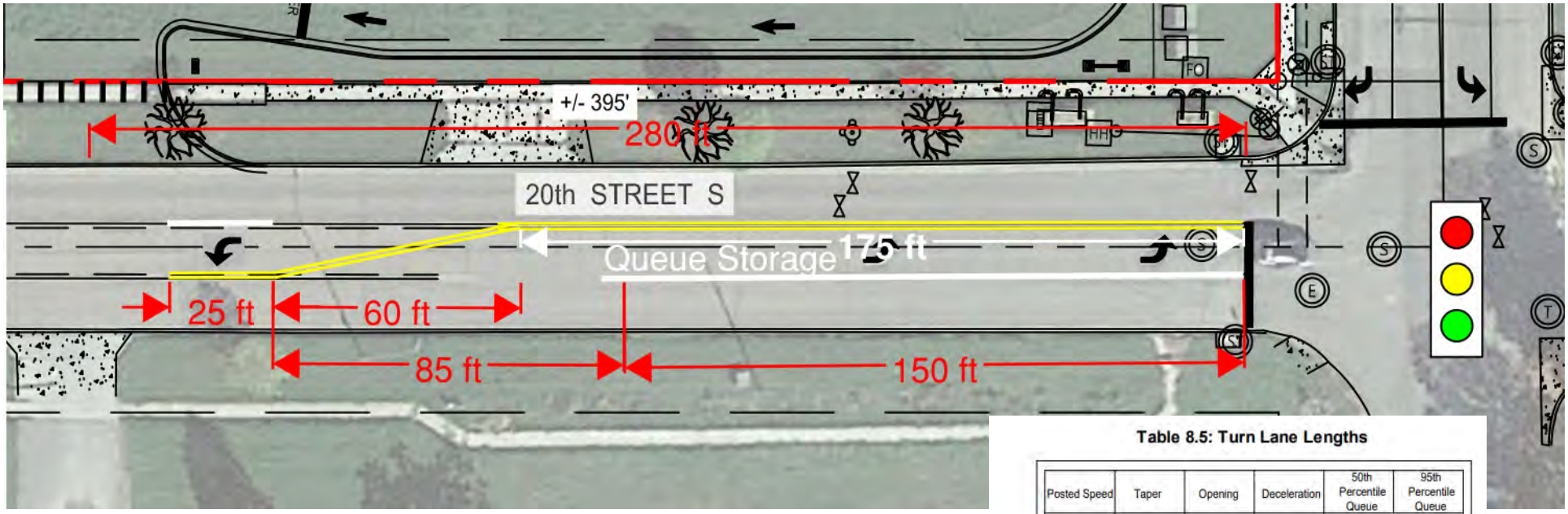


Table 8.5: Turn Lane Lengths

Posted Speed	Taper	Opening	Deceleration	50th Percentile Queue	95th Percentile Queue
30 mph	60'	60'	75'	Values determined by software analysis	
35 mph	60'	85'	75'		
40 mph	90'	120'	100'		
45 mph	120'	150'	125'		

Method I

Opening | Deceleration | 50th Percentile Queue

Taper

Or

Method II

Opening

Taper | 95th Percentile Queue

Use the larger of the two design methods for each turn lane

APPENDIX B: AGENCY COORDINATION

2025 SEA Tribal and Agency Coordination

SDDANR Coordination

DEPARTMENT OF TRANSPORTATION

Planning and Engineering
Environmental Office
700 E Broadway Avenue
Pierre, SD 57501-2586
O: 605.773.4336
dot.sd.gov

November 4, 2024

Macy Jo Peterson
SD Dept. of Agriculture & Natural Resources
523 E. Capitol Ave
Pierre, SD 57501-3181

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (EA)
Improvements at 20th Street South and 22nd Avenue South

Dear Ms. Peterson:

We have previously coordinated with your agency for the completion of the 2020 Environmental Assessment (EA) for this project. The original project was the construction of a new interchange at Exit 130 within the City of Brookings and expansion of one mile of existing 20th Street South from a dead-end gravel road to a three-lane urban roadway with an adjacent shared use path. The project was construction in 2022 and 2023 and opened to traffic on July 29, 2023. Attached Figure 1 provides the area of the overall interchange project.

Due to timeframe, existing utilities, and Section 6(f) property constraints, the east-side corners of the 20th Street South/22nd Avenue South intersection were constructed to a substandard design that limited large truck movements. As a follow-up to the interchange project, SDDOT and the City of Brookings proposed to expand the intersection corners to better accommodate large trucks. A funding source has been identified for this follow-up project and construction is anticipated for the summer of 2025. This will involve acquisition of permanent right-of-way (ROW) for roadway purposes and temporary construction easement on the southwest corner of Edgebrook Golf course. The expanded intersection would require reconstruction of a portion of the Allyn Frerichs Trail. Future widening (by year 2045) of 20th Street South and 22nd Avenue South are also part of this environmental analysis. Figure 2 illustrates the specific area for which we request your review and comments at this time.

Please comment on any of the following topics that pertain to your agency:

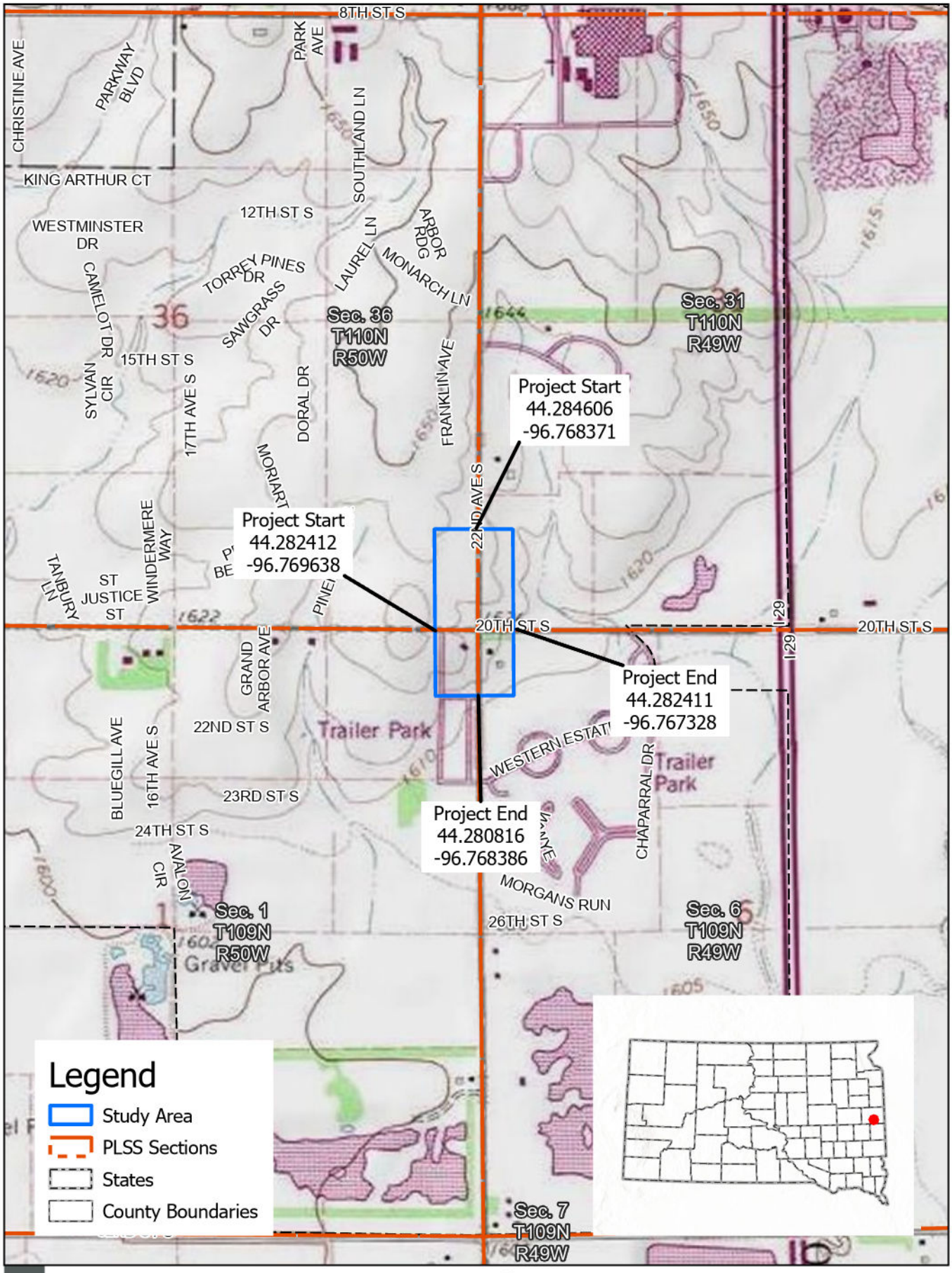
1	Tanks and Spills	6	Ground Water
2	Solid and Hazardous Waste	7	Water Rights
3	Air Quality	8	Forestry
4	Drinking Water	9	Superfund
5	Surface Water		

Please submit your comments as soon as possible, so that the project's environmental documentation can be completed, and the project can be let and constructed in a timely manner.

Sincerely,

Chad Babcock
Environmental Manager
605.773.3721

Attachment



HDR brookings SD DOT

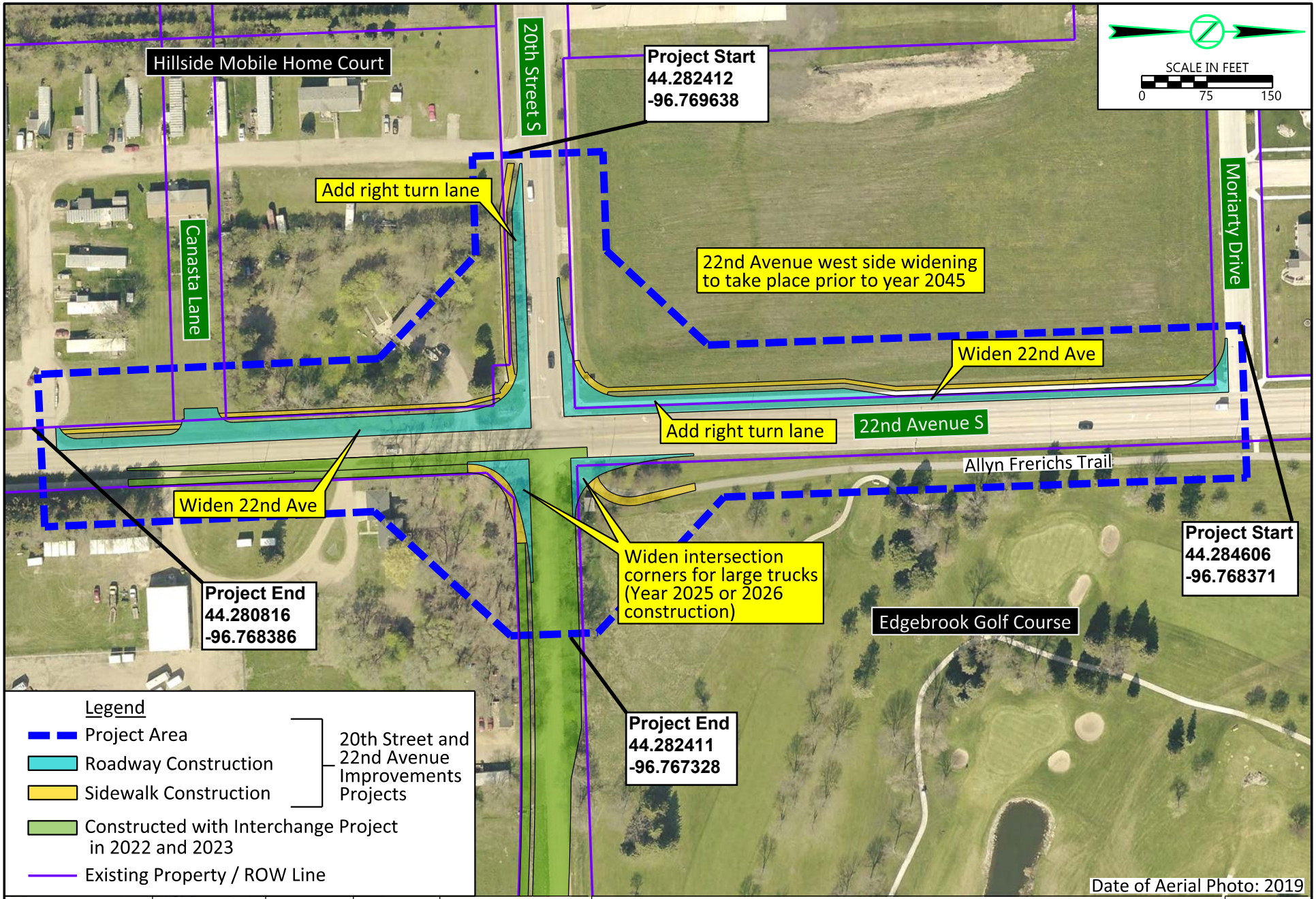
0 800 US Feet

PROJECT LOCATION MAP

EM 0295(45) 130, PCN 020V, Brookings County

FIGURE 1

Y:\PROJECTS\CITY_OF_BROOKINGS\20THST_EXPANSION\7.2_WIP\APRX\BROOKINGS_20THSTEXPANSION.APRX DATE: 9/4/2024



Drawn By: B.Miller
Date: 9/6/2024
Chked By: J.Unruh
Date: 9/6/2024
Revision:

Project Area for 20th Street / 22nd Avenue Intersection Expansion and Widening

I-29 Exit 130 (20th Street S) Interchange PCN 020V — Brookings, SD

Figure 2

DEPARTMENT of AGRICULTURE and NATURAL RESOURCES
JOE FOSS BUILDING
523 E CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

November 20, 2024

Jill Rust
HDR
South Dakota Citizens Portal
Record Request Number: PUBRECREQ0002908

Subject: Environmental Review – EM0295(45) 130, PCN 020V, Brookings County.

Dear Ms. Rust:

The South Dakota Department of Agriculture and Natural Resources (DANR) has reviewed the above-referenced project for potential impacts to natural resources. Based on the information submitted, DANR has the following comments and permitting requirements.

Air Quality
This project is unlikely to have adverse impacts to air quality in the area. Should the parameters of the project change, please reach out to Tanner Turk at Tanner.Turk@state.sd.us or (605) 773-3151.

Drinking Water
This project will not have adverse environmental effects to drinking water in this area. Should the parameters of your project change, please reach out to Eric Fuehrer at (605) 773-6039 or Eric.Fuehrer@state.sd.us.

Forestry
Based on the information provided Resource Conservation & Forestry has determined this project will have no significant impact on the woodland/forestry resources of the area. Should changes or adjustments be made to the location of this project, please reach out to Amanda Morrison at Amanda.morrison@state.sd.us or (605) 394-2279.

Groundwater
This project is unlikely to have adverse effects on ground water quality. Should the parameters of your project change, please reach out to Matt Hicks at (605) 773-5337 or Matt.Hicks@state.sd.us. If this project impacts tribal lands, DANR recommends you also consult the tribe's environmental coordinator for any additional conditions.

Solid and Hazardous Waste
It appears, based on the information provided, this project will have little or no impact on solid waste management in the area. If you have any questions, please contact Waste Management at (605) 773-3153.

It is not expected that any hazardous wastes sites will be encountered within the vicinity of your project area. However, if road construction is planned for areas within a city or town, the contractor should contact this Department prior to construction. Should any hazardous waste be generated during the implementation of this project, the generator must abide by all applicable hazardous waste regulations. To determine whether your project may generate hazardous waste, visit: https://www.epa.gov/hwgenerators/managing-your-hazardous-waste-guide-small-businesses. If you have any questions, please contact Anthony Wagner at (605) 773-3153, or anthony.wagner@state.sd.us.

Demolition or renovation of a building structure may be subject to the South Dakota asbestos requirements. If demolition or renovation is part of this construction project, or if the scope of the project changes to include demolition or renovation, please contact Anthony Wagner.

Surface Water
All surface waters are considered waters of the State and are protected under ARSD 74:51:01. This includes all rivers, streams, lakes, and wetlands regardless of federal waters of the United States jurisdictional status. Any project proposing to impact, alter, use, or discharge any substance including fill materials must contact the Department of Agriculture and Natural Resources prior to engaging in the proposed activity.

If this project impacts tribal lands, EPA Region 8 may require a NPDES permit for stormwater discharges from construction activities (1 acre or larger) or if any construction dewatering should occur; contact EPA Region 8 NPDES Staff. DANR recommends you contact the proper tribal authorities for any additional conditions.

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site. Any construction activity that disturbs an area of one or more acres of land must have authorization under the General Permit for Storm Water Discharges Associated with Construction Activities. A Surface Water Discharge permit may be required if any construction dewatering should occur because of this project. Contact the Department of Agriculture and Natural Resources for additional information or guidance at 1-800-SDSTORM +1(800) 737-8676 or https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/default.aspx.

The discharge of pollutants from any source, including indiscriminate use of fill material, may not cause destruction or impairment except where authorized under Section 404 of the Federal Water Pollution Control Act. Please contact the United States Army Corps of Engineers for more information (605) 224-8531.

The Water Quality Program has several interactive maps on our website to search for locations of interest to check for any active or terminated surface water discharge permits. If the location in question does have a permit, the related documents can be found in a table under our interactive maps. If you are unable to find the information you are searching for, please contact the WQP at (605) 773-3351. The following links are to the various WQP search maps:

Individual Surface Water Discharge Permit (NPDES) Search:
https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/swdpermitting/wwDBSearch.aspx.
For additional questions, please reach out to SWDPermits@state.sd.us.

Stormwater Permit (Industrial, Construction, and Contractor Authorization) Search:
https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/stormwater/StormWaterDBSearch.aspx.
For additional questions, please reach out to stormwater@state.sd.us.

Tanks and Spills
The Inspection, Compliance, and Remediation Program (ICRP) maintains a database of registered storage tanks and spills/environmental events, including petroleum and chemical releases in South Dakota. For information about all currently known tanks and spills/environmental events (including pdf copies of case files), please visit: https://apps.sd.gov/nr42interactivemap. We also recommend you check the online database as your project progresses, for information about any future spills/environmental events or registered tanks that may be in or near your project area.

While we do our best to maintain accurate information about spills/environmental events and registered tanks, in some cases the location information provided to us may have been inaccurate. If contamination is encountered or if a spill occurs during onsite construction activity, that contamination or spill must be reported to DANR at (605) 773-3296 (605-773-3231 after hours). Contaminated soil that has been excavated should be segregated from clean soil and sampled to determine disposal requirements.

Water Rights
The proposed project may require water or dewatering during construction. If a water supply or dewatering is needed during construction of any project that is pumped from surface or ground water, a temporary permit for the use of public water shall be obtained. If water is supplied by a municipality or rural water system for construction purposes, no additional water permitting is required. For more information on water rights permitting, please contact Amanda Dewell at Amanda.Dewell@state.sd.us or (605) 773-3352 if you have any questions.

If this project impacts property subject to tribal jurisdiction, state records may be incomplete. DANR recommends that you contact the proper tribal authorities for additional information. Thank you for providing DANR the opportunity to comment on

this project. If you have any questions regarding the information provided, please contact me at Trish.Kindt@state.sd.us or (605) 773-3296.

Sincerely,

Trish Kindt

Trish Kindt
Scientist Manager
SD DANR
Phone: (605) 773-3296
Email: Trish.Kindt@state.sd.us

USFWS Coordination

DEPARTMENT OF TRANSPORTATION

Planning and Engineering
Environmental Office
700 E Broadway Avenue
Pierre, SD 57501-2586
O: 605.773.4336
dot.sd.gov

December 13, 2024

Christopher Swanson, Field Supervisor
U.S. Fish & Wildlife Service
420 Garfield - Suite 400
Pierre, SD 57501-5408

RE: EM 0295(45)130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (EA)
Improvements at 20th Street South and 22nd Avenue South

Dear Mr. Swanson:

The South Dakota Department of Transportation (SDDOT) is proposing improvements to the intersection of 20th Street South and 22nd Avenue South. This area is associated with I-29 Exit 130. An initial Environmental Assessment (EA) was previously developed and coordination with your agency was completed in 2020. The SDDOT is in the process of developing a supplemental EA for this project to evaluate the reconstruction of the 20th Street and 22nd Avenue intersection to improve the turning radius. This project is anticipated to be constructed in summer of 2025. This will involve permanent right-of-way (ROW) for roadway purposes and temporary construction easements. Future widening (by year 2045) of 20th St South and 22nd Ave South are also part of this environmental analysis.

Attached is information on the above project for your review and comment.

According to the U.S. Fish & Wildlife Service (FWS) IPaC Information for Planning and Conservation system, the following species are known to occur in Brookings County:
(Consultation code: 2025-0023938).

Species	Status	SDDOT Determination	Comments
Northern Long-eared Bat	Endangered	No Effect	Species prefers forested areas for summer maternity and roosting activities. Due to study area's location near existing roadways and high traffic areas, suitable habitat is limited, and it is unlikely the species would be located within the study area.
Rufa Red Knot	Threatened	No Effect	Species prefers habitats along large open bodies of water, such as river sandbars and salt marshes. Suitable habitat is not present within the study area.
Topeka Shiner	Endangered	No Effect	Species lives in streams within the Big Sioux River watershed. No streams are present within study area.

Dakota Skipper	Threatened	No Effect	Species prefers high-quality mixed and tallgrass prairie habitats. The study area consists primarily of highly manicured lawn grass within and adjacent to a street intersection, and therefore we conclude that it is unlikely that habitat for the Dakota Skipper would be impacted by the project.
Monarch Butterfly	Proposed Threatened	No Effect	Species prefers habitats that include native vegetation and often require the presence of milkweed species. The study area primarily consists of highly manicured lawns within and adjacent to the roadway, and therefore it is unlikely that habitat for the Monarch Butterfly would be impacted by the project.
Western Regal Fritillary	Proposed Threatened	No Effect	Species prefers undisturbed tallgrass prairie. The project primarily consists of highly manicured lawns within and adjacent to the roadway.
Western Prairie Fringed Orchid	Threatened	No Effect	Species requires moist prairies with little disturbance. Suitable habitat is not present within study area.

The project will be reviewed for wetland impacts. The project will comply with all federal and state environmental regulations.

Please submit your comments as soon as possible, so that the project's environmental documentation can be completed, and the project can be let and constructed in a timely manner.

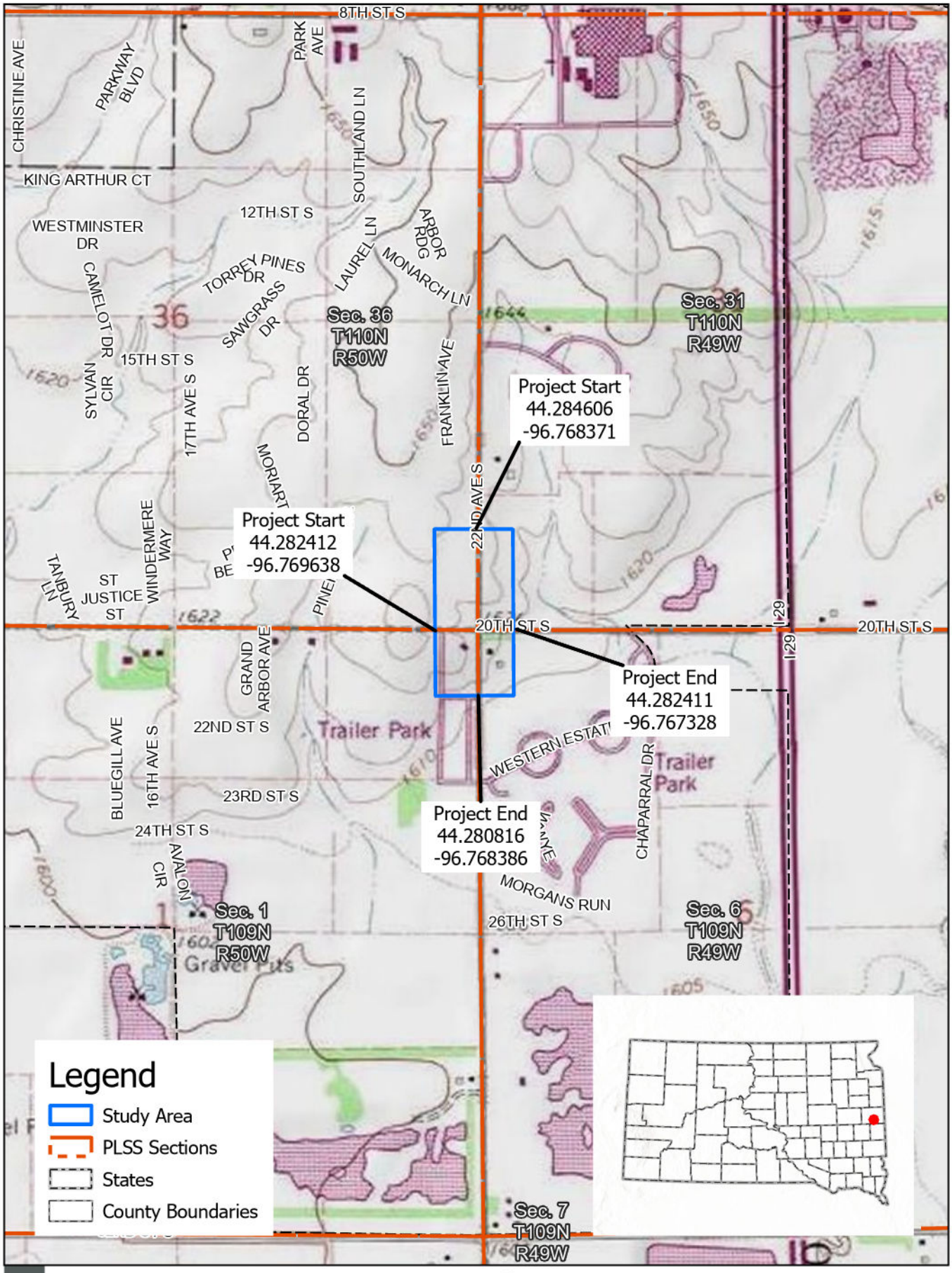
Sincerely,

Andrea Bierle

Andrea Bierle
Environmental Engineer II
605.773.3180

Attachments

- Project Location Map
- IPaC Species List
- NLEB Consistency Letter



HDR brookings SD DOT

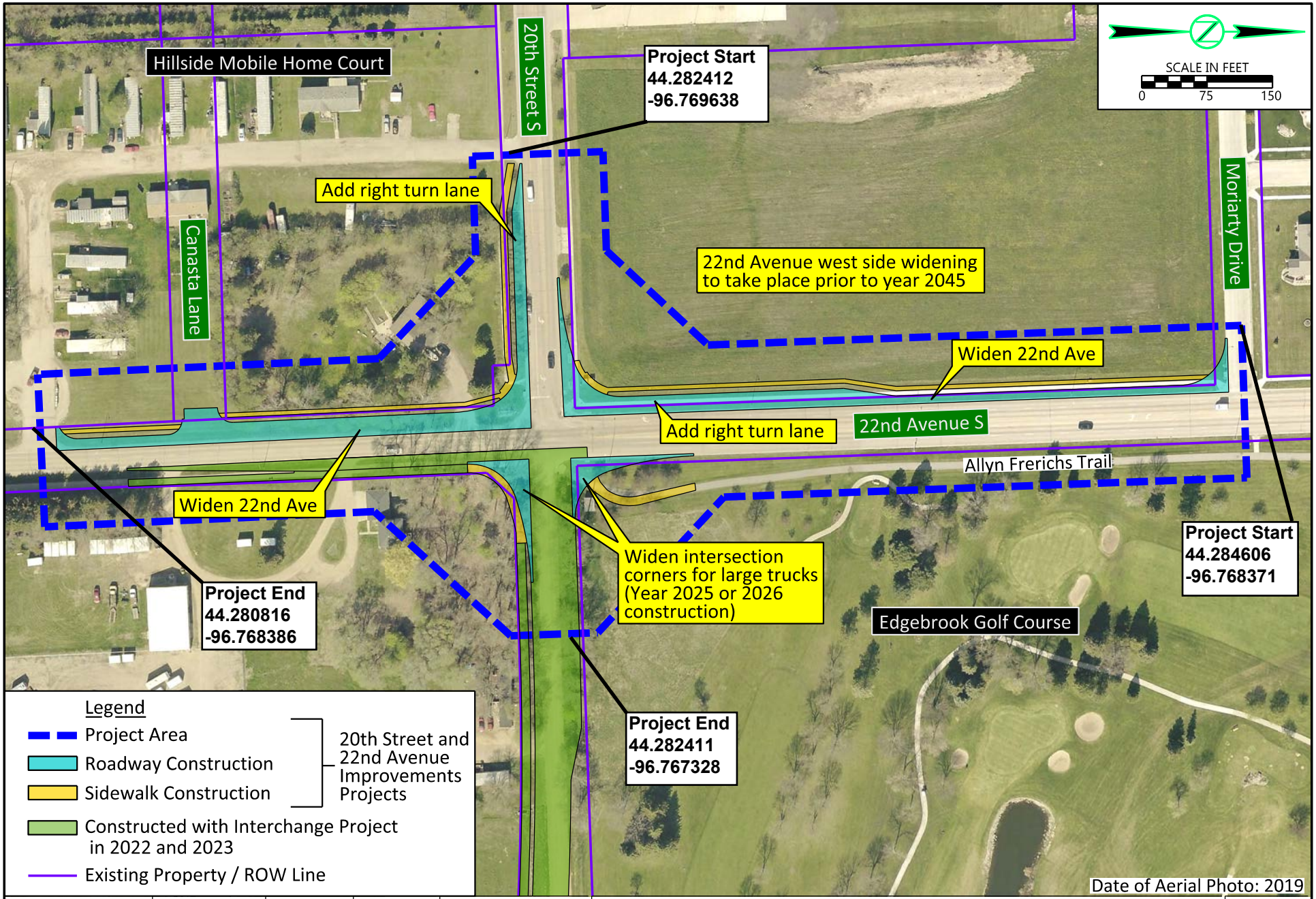
0 800 US Feet

PROJECT LOCATION MAP

EM 0295(45) 130, PCN 020V, Brookings County

FIGURE 1

Y:\PROJECTS\CITY_OF_BROOKINGS\20THST_EXPANSION\7.2_WIP\APRX\BROOKINGS_20THSTEXPANSION.APRX DATE: 9/4/2024



Drawn By: B.Miller
Date: 9/6/2024
Chked By: J.Unruh
Date: 9/6/2024
Revision:

Project Area for 20th Street / 22nd Avenue Intersection Expansion and Widening

I-29 Exit 130 (20th Street S) Interchange PCN 020V — Brookings, SD

Figure 2

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Dakota Ecological Services Field Office
420 South Garfield Avenue, Suite 400
Pierre, SD 57501-5408
Phone: (605) 224-8693 Fax: (605) 224-1416

In Reply Refer To: 12/10/2024 19:04:27 UTC
Project code: 2025-0023938
Project Name: I-29 Exit 130 Interchange (20th St./22nd Ave)-Brookings County

Subject: Consistency letter for the 'I-29 Exit 130 Interchange (20th St./22nd Ave)-Brookings County' project under the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (NLEB).

To whom it may concern:

The U.S. Fish and Wildlife Service (Service) has received your request dated December 10, 2024 to verify that the **I-29 Exit 130 Interchange (20th St./22nd Ave)-Brookings County** (Proposed Action) may rely on the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (PBO) to satisfy requirements under section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 *et seq.*).

Based on the information you provided (Project Description shown below), you have determined that the Proposed Action will have no effect on the endangered Indiana bat (*Myotis sodalis*) or the endangered northern long-eared bat (*Myotis septentrionalis*). If the Proposed Action is not modified, **no consultation is required for these two species.** If the Proposed Action is modified, or new information reveals that it may affect the Indiana bat and/or northern long-eared bat in a manner or to an extent not considered in the PBO, further review to conclude the requirements of ESA section 7(a)(2) may be required.

For Proposed Actions that include bridge/culvert or structure removal, replacement, and/or maintenance activities:
If your initial bridge/culvert or structure assessment failed to detect Indiana bats and/or NLEBs use or occupancy, yet later detected prior to, or during construction, please submit the Post Assessment Discovery of Bats at Bridge/Culvert or Structure Form (User Guide Appendix E) to this Service Office within 2 working days of the incident. In these instances, potential incidental take of Indiana bats and/or NLEBs may be exempted provided that the take is reported to the Service.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Dakota Ecological Services Field Office
420 South Garfield Avenue, Suite 400
Pierre, SD 57501-5408
Phone: (605) 224-8693 Fax: (605) 224-1416

In Reply Refer To: 11/25/2024 17:03:07 UTC
Project Code: 2025-0023938
Project Name: I-29 Exit 130 Interchange (20th St./22nd Ave)-Brookings County

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/media/endangered-species-consultation-handbook

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/law/bald-and-golden-eagle-protection-act, https://www.fws.gov/media/endangered-species-act-1, and/or https://www.fws.gov/law/migratory-bird-treaty-act-1918.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/law/migratory-birds

Please be aware that bald and golden eagles are protected under the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712, as amended), as well as the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Projects affecting these species may benefit from the development of an Eagle Conservation Plan (ECP), see guidance at this website (https://www.fws.gov/node/266177). An ECP can assist developers in achieving compliance with regulatory requirements, help avoid “take” of eagles at project sites, and provide biological support for eagle permit applications. Additionally, we recommend wind energy

developments adhere to our Land-based Wind Energy Guidelines for minimizing impacts to migratory birds and bats.
We have recently updated our guidelines for minimizing impacts to migratory birds at projects that have communication towers (including meteorological, cellular, digital television, radio, and emergency broadcast towers). These guidelines can be found at:

https://www.fws.gov/story/incidental-take-beneficial-practices-communication-towers
http://www.towerkill.com

According to National Wetlands Inventory maps, (available online at https://www.fws.gov/library/collections/national-wetland-inventory) wetlands exist adjacent to the proposed construction corridor. If a project may impact wetlands or other important fish and wildlife habitats, the U.S. Fish and Wildlife Service (Service), in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347) and other environmental laws and rules, recommends complete avoidance of these areas, if possible. If this is not possible, attempts should be made to minimize adverse impacts. Finally if adverse impacts are unavoidable, measures should be undertaken to replace the impacted areas. Alternatives should be examined and the least damaging practical alternative selected. If wetland impacts are unavoidable, a mitigation plan addressing the number and types of wetland acres to be impacted, and the methods of replacement should be prepared and submitted to the resource agencies for review.

Please check with your local wetland management district to determine whether Service interest lands exist at the proposed project site, the exact locations of these properties, and any additional restrictions that may apply regarding these sites. The Offices are listed below. If you are not sure which office to contact, we can help you make that decision.

U.S. Fish and Wildlife Service, Huron Wetland Management District, Federal Building, Room 309, 200 4th Street SW, Huron, SD 57350; telephone (605) 352-5894. Counties in the Huron WMD: Beadle, Buffalo, Hand, Hughes, Hyde, Jerauld, Sanborn, Sully.

U.S. Fish and Wildlife Service, Lake Andes Wetland Management District, P O Box 18, Pickstown, South Dakota, 57367; telephone (605) 487-7603. Counties in the Lake Andes WMD: Aurora, Brule, Charles Mix, Davison, Douglas.

U.S. Fish and Wildlife Service, Madison Wetland Management District, P.O. Box 48, Madison, South Dakota, 57042, telephone (605) 256-2974. Counties in the Madison WMD: Bon Homme, Brookings, Clay, Deuel, Hamlin, Hanson, Hutchinson, Kingsbury, Lake, Lincoln, McCook, Miner, Minnehaha, Moody, Turner, Union, Yankton.

U.S. Fish and Wildlife Service, Sand Lake Wetland Management District, 39650 Sand Lake Drive, Columbia, South Dakota, 57433; telephone (605) 885-6320. Counties in the Sand Lake WMD: Brown, Campbell, Edmunds, Faulk, McPherson, Potter, Spink, Walworth.

U.S. Fish and Wildlife Service, Waubay Wetland Management District, 44401 134A Street, Waubay, South Dakota, 57273; telephone (605) 947-4521. Counties in the Waubay WMD: Clark, Codington, Day,

Grant, Marshall, Roberts.

You are welcome to visit our website (https//www.fws.gov/office/southdakota-ecological-services) or to contact our office/staff at the address or phone number above for more information.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

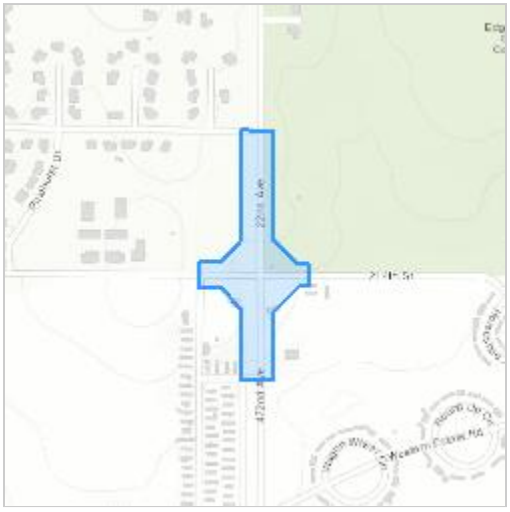
South Dakota Ecological Services Field Office
420 South Garfield Avenue, Suite 400
Pierre, SD 57501-5408
(605) 224-8693

PROJECT SUMMARY

Project Code: 2025-0023938
Project Name: I-29 Exit 130 Interchange (20th St./22nd Ave)-Brookings County
Project Type: Road/Hwy - Maintenance/Modification
Project Description: The South Dakota Department of Transportation is proposing improvements to the intersection of 20th Street and 22nd Avenue, this area is associated with I-29 Exit 130. In an initial EA was previously developed, the SDDOT is in the process of developing a supplemental EA for this project. This Supplemental EA is to evaluate the reconstruction of the 20th Street and 22nd Avenue intersection to improve the turning radius.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@44.282718200000005,-96.76842621311076,14z



Counties: Brookings County, South Dakota

ENDANGERED SPECIES ACT SPECIES

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

BIRDS

NAME	STATUS
Rufa Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

FISHES

NAME	STATUS
Topeka Shiner *Notropis topeka (=tristis)* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4122	Endangered

INSECTS

NAME	STATUS
Dakota Skipper *Hesperia dacotae* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1028	Threatened
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate
Western Regal Fritillary *Argynnis idalia occidentalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/12017	Proposed Threatened

FLOWERING PLANTS

NAME	STATUS
Western Prairie Fringed Orchid *Platanthera praeclara* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1669	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31

NAME	BREEDING SEASON
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

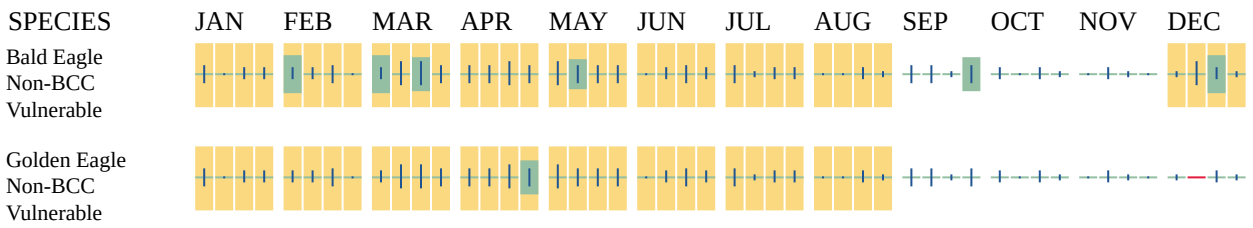
Probability of Presence (▪)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (▪)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management

- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Golden-plover *Pluvialis dominica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10561	Breeds elsewhere
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black Tern *Chlidonias niger surinamenisis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3093	Breeds May 15 to Aug 20

NAME	BREEDING SEASON
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9454	Breeds May 20 to Jul 31
California Gull *Larus californicus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10955	Breeds Mar 1 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Franklin's Gull *Leucophaeus pipixcan* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10567	Breeds May 1 to Jul 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Golden-winged Warbler *Vermivora chrysoptera* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Grasshopper Sparrow *Ammodramus savannarum perpallidus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8329	Breeds Jun 1 to Aug 20
Hudsonian Godwit *Limosa haemastica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9482	Breeds elsewhere
Le Conte's Sparrow *Ammospiza leconteii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9469	Breeds Jun 1 to Aug 15

NAME	BREEDING SEASON
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-eared Owl *asio otus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3631	Breeds Mar 1 to Jul 15
Marbled Godwit *Limosa fedoa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds May 1 to Jul 31
Northern Harrier *Circus hudsonius* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8350	Breeds Apr 1 to Sep 15
Pectoral Sandpiper *Calidris melanotos* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10669	Breeds Apr 20 to Aug 5

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

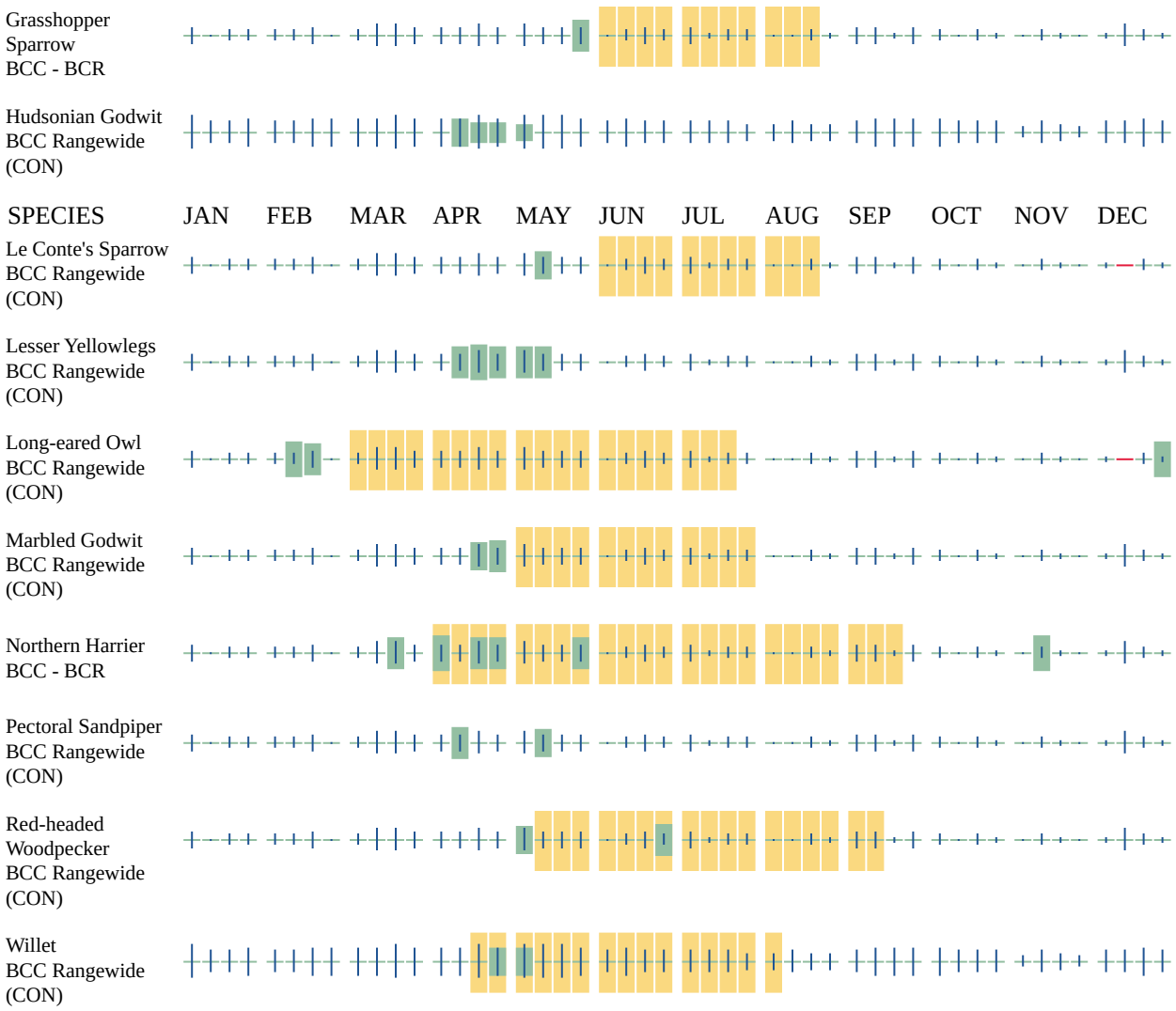
Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)

Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

THERE ARE NO WETLANDS WITHIN YOUR PROJECT AREA.

IPAC USER CONTACT INFORMATION

Agency: South Dakota Department of Transportation
Name: Emma Koeckeritz
Address: 51 North Broadway Suite 550
City: Fargo
State: ND
Zip: 58102
Email ekoeckeritz@hdrinc.com
Phone: 7015529946

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Highway Administration

DEPARTMENT OF TRANSPORTATION

Planning and Engineering
Environmental Office
700 E Broadway Avenue
Pierre, SD 57501-2586
O: 605.773.4336
dot.sd.gov

There is no requirement under the implementing regulations of the Endangered Species Act (50 CFR Part 402) for federal agencies to receive U.S. Fish and Wildlife Service concurrence with "no effect" determinations; therefore, responsibility for "no effect" determinations remains with each federal agency. Accordingly, we recommend the action agency retain the documentation for these listed resources in the decisional record for this federal action.

South Dakota Ecological Services Date

December 13, 2024

Christopher Swanson, Field Supervisor
U.S. Fish & Wildlife Service
420 Garfield - Suite 400
Pierre, SD 57501-5408

RE: EM 0295(45)130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (EA)
Improvements at 20th Street South and 22nd Avenue South

Dear Mr. Swanson:

The South Dakota Department of Transportation (SDDOT) is proposing improvements to the intersection of 20th Street South and 22nd Avenue South. This area is associated with I-29 Exit 130. An initial Environmental Assessment (EA) was previously developed and coordination with your agency was completed in 2020. The SDDOT is in the process of developing a supplemental EA for this project to evaluate the reconstruction of the 20th Street and 22nd Avenue intersection to improve the turning radius. This project is anticipated to be constructed in summer of 2025. This will involve permanent right-of-way (ROW) for roadway purposes and temporary construction easements. Future widening (by year 2045) of 20th St South and 22nd Ave South are also part of this environmental analysis.

Attached is information on the above project for your review and comment.

According to the U.S. Fish & Wildlife Service (FWS) IPaC Information for Planning and Conservation system, the following species are known to occur in Brookings County:
(Consultation code: 2025-0023938).

Species	Status	SDDOT Determination	Comments
Northern Long-eared Bat	Endangered	No Effect	Species prefers forested areas for summer maternity and roosting activities. Due to study area's location near existing roadways and high traffic areas, suitable habitat is limited, and it is unlikely the species would be located within the study area.
Rufa Red Knot	Threatened	No Effect	Species prefers habitats along large open bodies of water, such as river sandbars and salt marshes. Suitable habitat is not present within the study area.
Topeka Shiner	Endangered	No Effect	Species lives in streams within the Big Sioux River watershed. No streams are present within study area.

Dakota Skipper	Threatened	No Effect	Species prefers high-quality mixed and tallgrass prairie habitats. The study area consists primarily of highly manicured lawn grass within and adjacent to a street intersection, and therefore we conclude that it is unlikely that habitat for the Dakota Skipper would be impacted by the project.
Monarch Butterfly	Proposed Threatened	No Effect	Species prefers habitats that include native vegetation and often require the presence of milkweed species. The study area primarily consists of highly manicured lawns within and adjacent to the roadway, and therefore it is unlikely that habitat for the Monarch Butterfly would be impacted by the project.
Western Regal Fritillary	Proposed Threatened	No Effect	Species prefers undisturbed tallgrass prairie. The project primarily consists of highly manicured lawns within and adjacent to the roadway.
Western Prairie Fringed Orchid	Threatened	No Effect	Species requires moist prairies with little disturbance. Suitable habitat is not present within study area.

The project will be reviewed for wetland impacts. The project will comply with all federal and state environmental regulations.

Please submit your comments as soon as possible, so that the project's environmental documentation can be completed, and the project can be let and constructed in a timely manner.

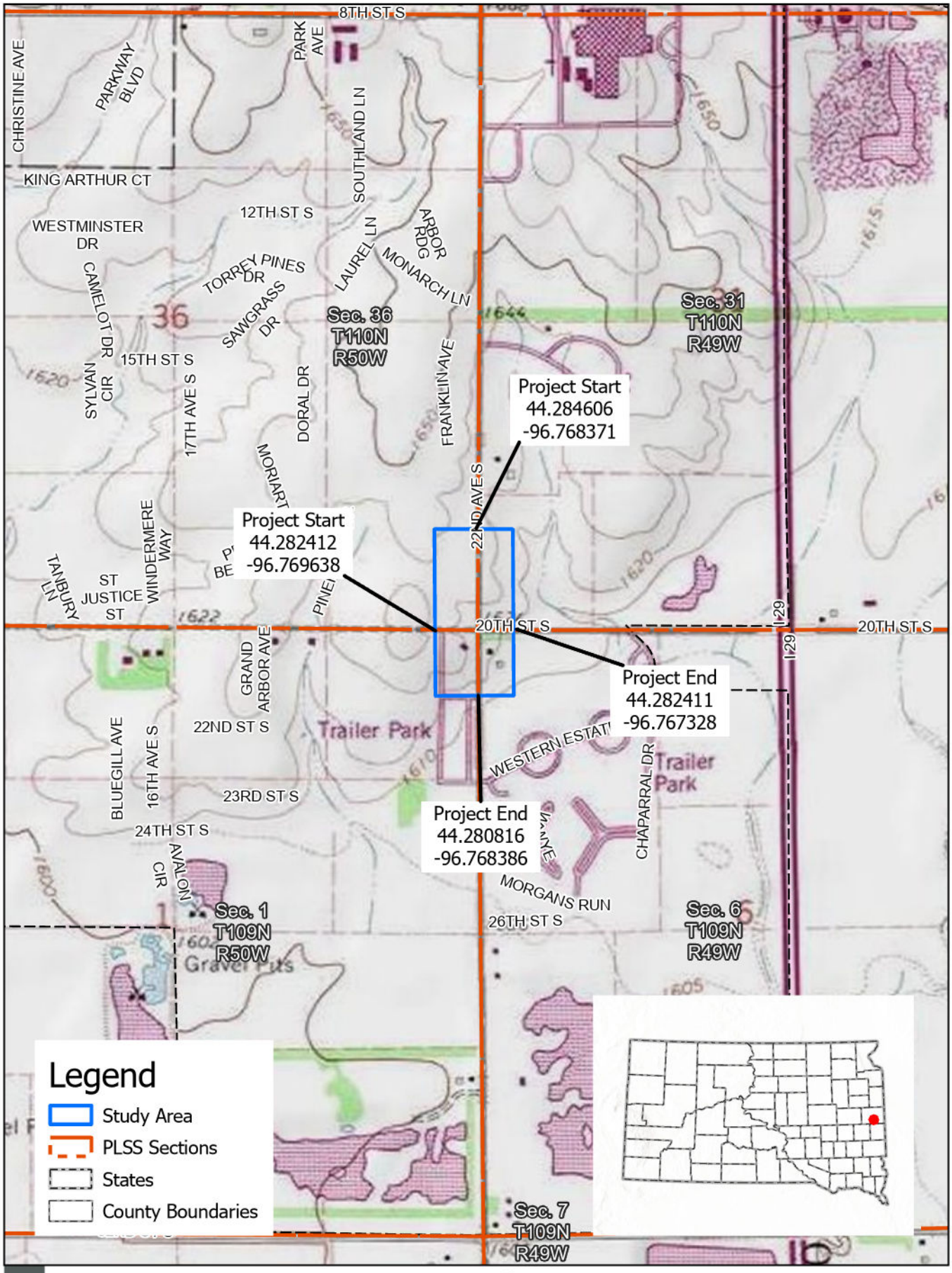
Sincerely,

Andrea Bierle

Andrea Bierle
Environmental Engineer II
605.773.3180

Attachments

- Project Location Map
- IPaC Species List
- NLEB Consistency Letter



HDR brookings SD DOT

0 800 US Feet

PROJECT LOCATION MAP

EM 0295(45) 130, PCN 020V, Brookings County

FIGURE 1

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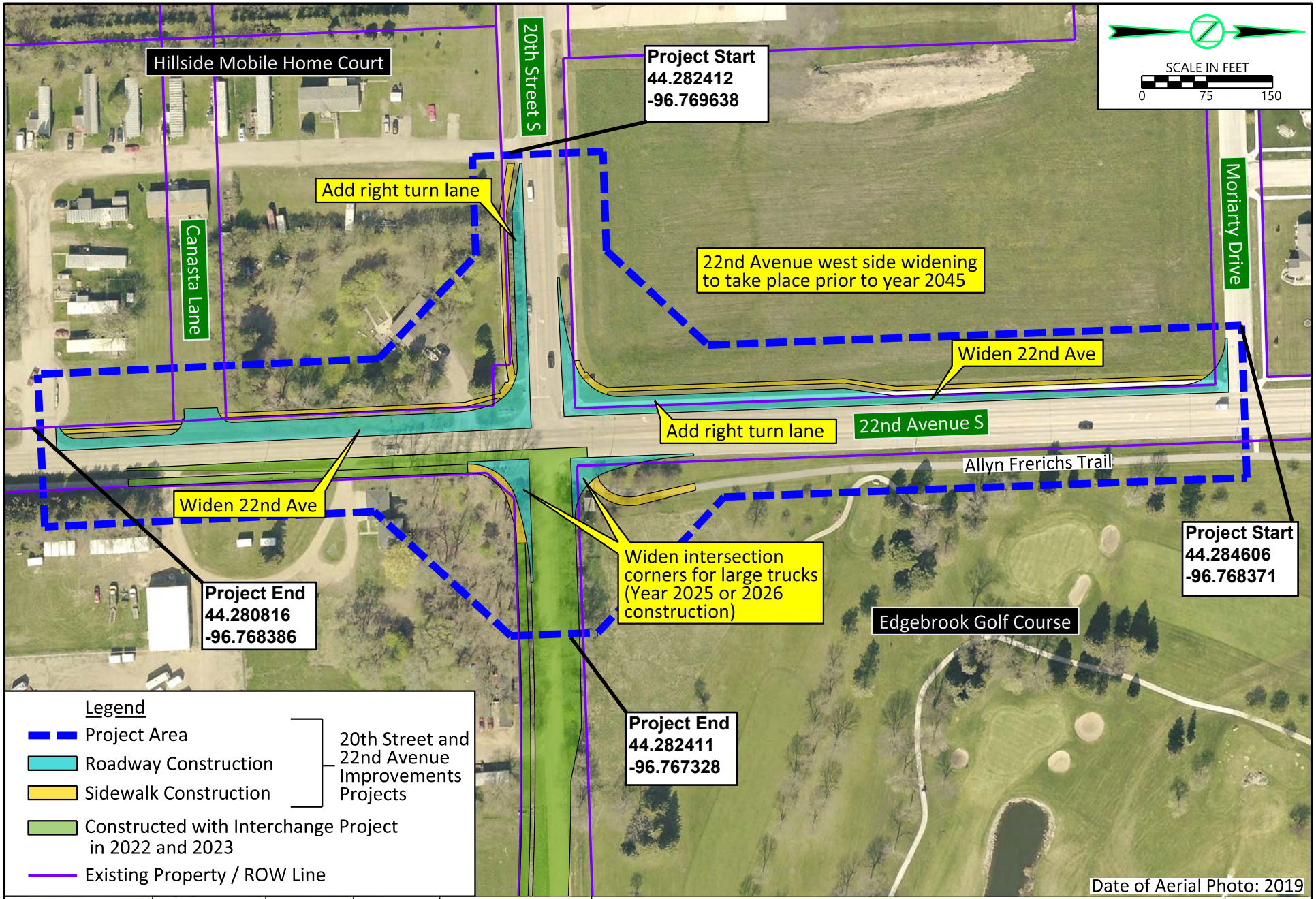


Drawn By: B.Miller
Date: 9/6/2024
Chked By: J.Unruh
Date: 9/6/2024
Revision:

Project Area for 20th Street / 22nd Avenue Intersection Expansion and Widening

I-29 Exit 130 (20th Street S) Interchange PCN 020V — Brookings, SD

Figure 2

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Dakota Ecological Services Field Office
420 South Garfield Avenue, Suite 400
Pierre, SD 57501-5408
Phone: (605) 224-8693 Fax: (605) 224-1416

In Reply Refer To: 12/10/2024 19:04:27 UTC
Project code: 2025-0023938
Project Name: I-29 Exit 130 Interchange (20th St./22nd Ave)-Brookings County

Subject: Consistency letter for the 'I-29 Exit 130 Interchange (20th St./22nd Ave)-Brookings County' project under the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (NLEB).

To whom it may concern:

The U.S. Fish and Wildlife Service (Service) has received your request dated December 10, 2024 to verify that the **I-29 Exit 130 Interchange (20th St./22nd Ave)-Brookings County** (Proposed Action) may rely on the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (PBO) to satisfy requirements under section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 *et seq.*).

Based on the information you provided (Project Description shown below), you have determined that the Proposed Action will have no effect on the endangered Indiana bat (*Myotis sodalis*) or the endangered northern long-eared bat (*Myotis septentrionalis*). If the Proposed Action is not modified, **no consultation is required for these two species.** If the Proposed Action is modified, or new information reveals that it may affect the Indiana bat and/or northern long-eared bat in a manner or to an extent not considered in the PBO, further review to conclude the requirements of ESA section 7(a)(2) may be required.

For Proposed Actions that include bridge/culvert or structure removal, replacement, and/or maintenance activities:
If your initial bridge/culvert or structure assessment failed to detect Indiana bats and/or NLEBs use or occupancy, yet later detected prior to, or during construction, please submit the Post Assessment Discovery of Bats at Bridge/Culvert or Structure Form (User Guide Appendix E) to this Service Office within 2 working days of the incident. In these instances, potential incidental take of Indiana bats and/or NLEBs may be exempted provided that the take is reported to the Service.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Dakota Ecological Services Field Office
420 South Garfield Avenue, Suite 400
Pierre, SD 57501-5408
Phone: (605) 224-8693 Fax: (605) 224-1416

In Reply Refer To: 11/25/2024 17:03:07 UTC
Project Code: 2025-0023938
Project Name: I-29 Exit 130 Interchange (20th St./22nd Ave)-Brookings County

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/media/endangered-species-consultation-handbook

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/law/bald-and-golden-eagle-protection-act, https://www.fws.gov/media/endangered-species-act-1, and/or https://www.fws.gov/law/migratory-bird-treaty-act-1918.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/law/migratory-birds

Please be aware that bald and golden eagles are protected under the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712, as amended), as well as the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Projects affecting these species may benefit from the development of an Eagle Conservation Plan (ECP), see guidance at this website (https://www.fws.gov/node/266177). An ECP can assist developers in achieving compliance with regulatory requirements, help avoid “take” of eagles at project sites, and provide biological support for eagle permit applications. Additionally, we recommend wind energy

developments adhere to our Land-based Wind Energy Guidelines for minimizing impacts to migratory birds and bats.
We have recently updated our guidelines for minimizing impacts to migratory birds at projects that have communication towers (including meteorological, cellular, digital television, radio, and emergency broadcast towers). These guidelines can be found at:

https://www.fws.gov/story/incidental-take-beneficial-practices-communication-towers
http://www.towerkill.com

According to National Wetlands Inventory maps, (available online at https://www.fws.gov/library/collections/national-wetland-inventory) wetlands exist adjacent to the proposed construction corridor. If a project may impact wetlands or other important fish and wildlife habitats, the U.S. Fish and Wildlife Service (Service), in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347) and other environmental laws and rules, recommends complete avoidance of these areas, if possible. If this is not possible, attempts should be made to minimize adverse impacts. Finally if adverse impacts are unavoidable, measures should be undertaken to replace the impacted areas. Alternatives should be examined and the least damaging practical alternative selected. If wetland impacts are unavoidable, a mitigation plan addressing the number and types of wetland acres to be impacted, and the methods of replacement should be prepared and submitted to the resource agencies for review.

Please check with your local wetland management district to determine whether Service interest lands exist at the proposed project site, the exact locations of these properties, and any additional restrictions that may apply regarding these sites. The Offices are listed below. If you are not sure which office to contact, we can help you make that decision.

U.S. Fish and Wildlife Service, Huron Wetland Management District, Federal Building, Room 309, 200 4th Street SW, Huron, SD 57350; telephone (605) 352-5894. Counties in the Huron WMD: Beadle, Buffalo, Hand, Hughes, Hyde, Jerauld, Sanborn, Sully.

U.S. Fish and Wildlife Service, Lake Andes Wetland Management District, P O Box 18, Pickstown, South Dakota, 57367; telephone (605) 487-7603. Counties in the Lake Andes WMD: Aurora, Brule, Charles Mix, Davison, Douglas.

U.S. Fish and Wildlife Service, Madison Wetland Management District, P.O. Box 48, Madison, South Dakota, 57042, telephone (605) 256-2974. Counties in the Madison WMD: Bon Homme, Brookings, Clay, Deuel, Hamlin, Hanson, Hutchinson, Kingsbury, Lake, Lincoln, McCook, Miner, Minnehaha, Moody, Turner, Union, Yankton.

U.S. Fish and Wildlife Service, Sand Lake Wetland Management District, 39650 Sand Lake Drive, Columbia, South Dakota, 57433; telephone (605) 885-6320. Counties in the Sand Lake WMD: Brown, Campbell, Edmunds, Faulk, McPherson, Potter, Spink, Walworth.

U.S. Fish and Wildlife Service, Waubay Wetland Management District, 44401 134A Street, Waubay, South Dakota, 57273; telephone (605) 947-4521. Counties in the Waubay WMD: Clark, Codington, Day,

Grant, Marshall, Roberts.

You are welcome to visit our website (https//www.fws.gov/office/southdakota-ecological-services) or to contact our office/staff at the address or phone number above for more information.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

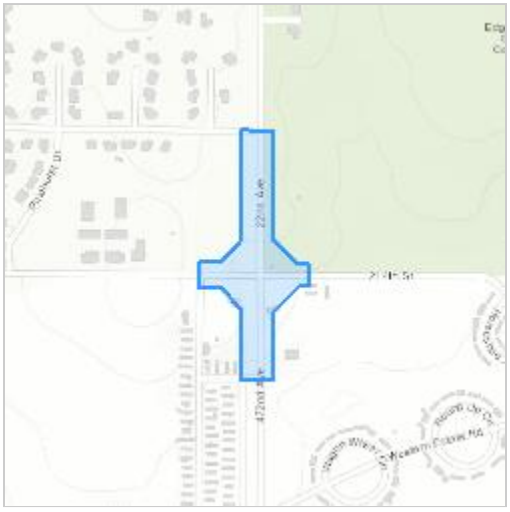
South Dakota Ecological Services Field Office
420 South Garfield Avenue, Suite 400
Pierre, SD 57501-5408
(605) 224-8693

PROJECT SUMMARY

Project Code: 2025-0023938
Project Name: I-29 Exit 130 Interchange (20th St./22nd Ave)-Brookings County
Project Type: Road/Hwy - Maintenance/Modification
Project Description: The South Dakota Department of Transportation is proposing improvements to the intersection of 20th Street and 22nd Avenue, this area is associated with I-29 Exit 130. In an initial EA was previously developed, the SDDOT is in the process of developing a supplemental EA for this project. This Supplemental EA is to evaluate the reconstruction of the 20th Street and 22nd Avenue intersection to improve the turning radius.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@44.282718200000005,-96.76842621311076,14z



Counties: Brookings County, South Dakota

ENDANGERED SPECIES ACT SPECIES

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

BIRDS

NAME	STATUS
Rufa Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

FISHES

NAME	STATUS
Topeka Shiner *Notropis topeka (=tristis)* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4122	Endangered

INSECTS

NAME	STATUS
Dakota Skipper *Hesperia dacotae* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1028	Threatened
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate
Western Regal Fritillary *Argynnis idalia occidentalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/12017	Proposed Threatened

FLOWERING PLANTS

NAME	STATUS
Western Prairie Fringed Orchid *Platanthera praeclara* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1669	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31

NAME	BREEDING SEASON
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

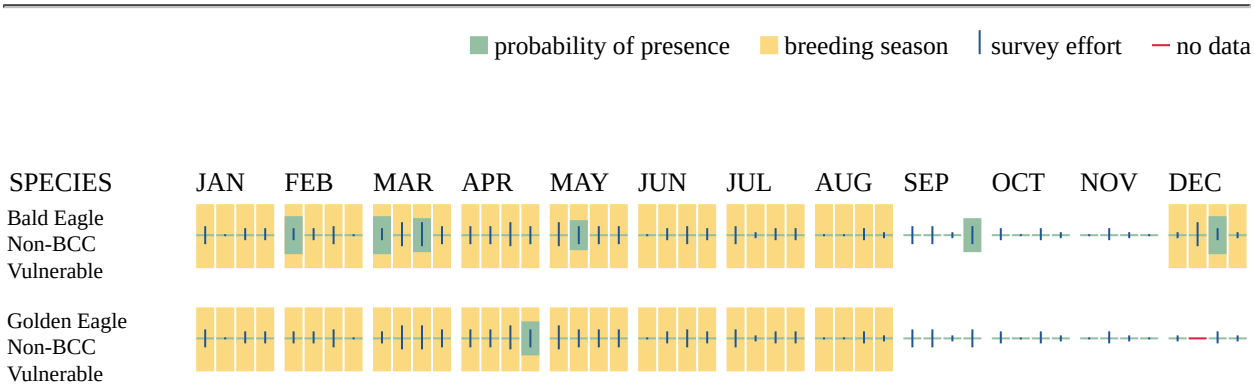
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management

- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Golden-plover *Pluvialis dominica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10561	Breeds elsewhere
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black Tern *Chlidonias niger surinamenisis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3093	Breeds May 15 to Aug 20

NAME	BREEDING SEASON
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9454	Breeds May 20 to Jul 31
California Gull *Larus californicus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10955	Breeds Mar 1 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Franklin's Gull *Leucophaeus pipixcan* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10567	Breeds May 1 to Jul 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Golden-winged Warbler *Vermivora chrysoptera* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Grasshopper Sparrow *Ammodramus savannarum perpallidus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8329	Breeds Jun 1 to Aug 20
Hudsonian Godwit *Limosa haemastica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9482	Breeds elsewhere
Le Conte's Sparrow *Ammospiza leconteii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9469	Breeds Jun 1 to Aug 15

NAME	BREEDING SEASON
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-eared Owl *asio otus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3631	Breeds Mar 1 to Jul 15
Marbled Godwit *Limosa fedoa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds May 1 to Jul 31
Northern Harrier *Circus hudsonius* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8350	Breeds Apr 1 to Sep 15
Pectoral Sandpiper *Calidris melanotos* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10669	Breeds Apr 20 to Aug 5

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

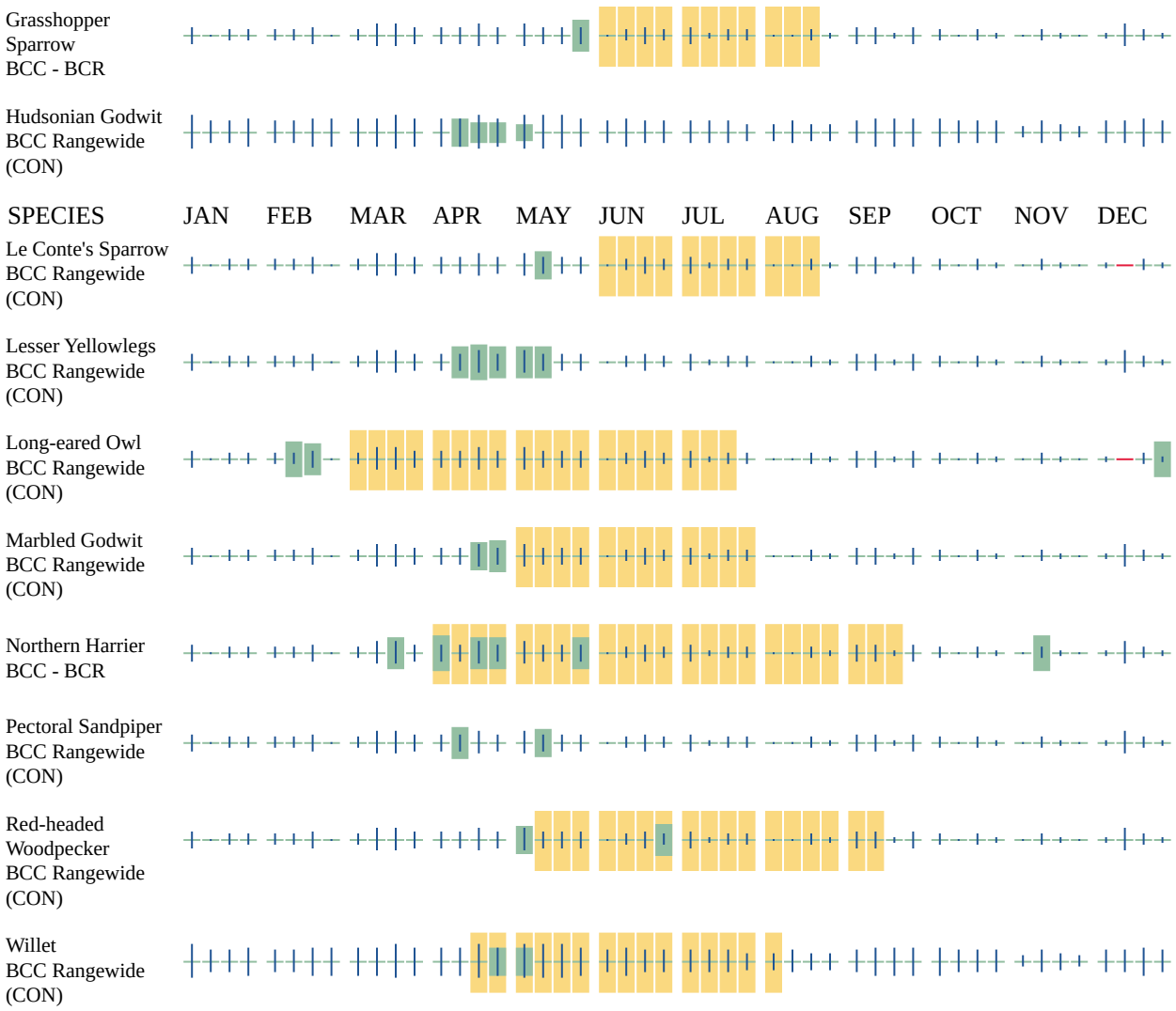
Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)

Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

THERE ARE NO WETLANDS WITHIN YOUR PROJECT AREA.

IPAC USER CONTACT INFORMATION

Agency: South Dakota Department of Transportation
Name: Emma Koeckeritz
Address: 51 North Broadway Suite 550
City: Fargo
State: ND
Zip: 58102
Email ekoeckeritz@hdrinc.com
Phone: 7015529946

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Highway Administration

Phase I Summer Habitat Assessments
Northern Long-Eared Bat Habitat Assessment Data Sheet

South Dakota Department of Transportation
Office of Administration-Environmental
Becker-Hansen Building
700 E. Broadway Ave.
Pierre, SD 57501-2586

Date: 12 / 10 / 24

Surveyor: Emma Koeckeritz
Phone (605) 773-5679
https://dot.sd.gov/doing-business/environmental/about-environmental

General Project Information

Project/PCN EM 0295(45)130, PCN 020V

Station #

MRM #

Structure #

County Brookings

Multiple Sample Sites? ○ Yes, See Comments ◉ No

Brief Project Description

The Project includes the intersection of 20th Street and 22nd Avenue, which is directly adjacent to the Edgebrook Golf Course.

Project Area

	Total acres	Forest acres	Open acres
Project (Acres of site being surveyed)	7.61	0	0

	Completely Cleared	Partially Cleared (Leave Some trees)	Preserve acres (no clearing)
Proposed tree removal (acres) ☐ No Removal	0.30		

Vegetation cover types

Pre-project	Other Deciduous	Other Coniferous	Ponderosa Pine	-	-
	-	-	-	-	-

Post-project

Vegetation will be similar post project. Disturbed areas will be re-vegetated post-construction.

Landscape within 5-Mile Radius

Flight corridors to other forested areas? (If yes, Describe. e.g. shelterbelt, forested, forested creek bottom, forested river bottom)

○ Yes ◉ No

Describe adjacent properties (e.g., forested, grassland, commercial or residential development, water sources).

Residential	Commercial	-

Proximity to public land (15 Mile Radius)

What is the distance in miles from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas or wildlife management areas)?

The City of Brookings property to the north of the Edgebrook Golf Course is a trail exercise course managed by the Parks and Recreation Department. A shelter belt exists on the property and is the nearest forested public land, located approximately 0.50 miles north of the Project Area.

Northern Long-Eared Bat Habitat Assessment Data Sheet (continued)

Additional information about discreet habitat types at multiple sites

Use additional sheets to assess discrete habitat types at multiple sites in a project area. Include a map depicting sample sites in project area. A single sheet can be used for multiple sample sites if the habitat is the same.

Sample Site Description (Station # / MRM#)

Sample site no. 1

Sample site no.

Water Resources at Sample Site

Stream type (# and length in FT)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources
Pools/ponds (# and size in acres)		Open and accessible to bats?		○ _____ provides potential summer water source.
		N/A		
Wetlands (Approx. acres)	Permanent		Seasonal	◉ No Water Source

Forest Resources at Sample Site

	Canopy (>50')	Midstory (20-50')	Understory (<20')
Closure/density (Use 1-6 from far right table)			1
Dominant species of mature trees	-	-	Other Deciduous
% of trees with exfoliating bark			0

1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%

Size composition of live trees (%)	Small (3-8 in.)	Med. (9-15 in.)	Large (>15 in.)
	100		

Total # of suitable snags 0

☑ No Forest Resources

(Suitable snags are standing dead trees with exfoliating bark, cracks, crevices or hollows.)

Conclusion

IS THE HABITAT SUITABLE FOR NORTHERN LONG-EARED BATS? No

Additional comments:

Northern long-eared bat habitat is presumed to not be present due to the area having limited amount of suitable trees and being near a high traffic area. No exfoliating bark or snags were present.

Representative photos for Sample Site 1 are included below.

Attach aerial map of project site with all forested areas labeled and a general description of the habitat.

Photographic documentation should include: habitat shots at edge and interior from multiple locations; canopy, midstory, understory; examples of potential suitable snags and live trees; and water resources.

Northern Long-Eared Bat Habitat Assessment Data Sheet (continued)

Additional information about discreet habitat types at multiple sites

Use additional sheets to assess discrete habitat types at multiple sites in a project area. Include a map depicting sample sites in project area. A single sheet can be used for multiple sample sites if the habitat is the same.

Sample Site Description (Station # / MRM#)

Sample site no. 2

Sample site no.

Water Resources at Sample Site

Stream type (# and length in FT)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources
Pools/ponds (# and size in acres)		Open and accessible to bats? N/A		○ _____ provides potential summer water source.
Wetlands (Approx. acres)	Permanent	Seasonal		◉ No Water Source

Forest Resources at Sample Site

	Canopy (>50')	Midstory (20-50')	Understory (<20')
Closure/density (Use 1-6 from far right table)		1	
Dominant species of mature trees	-	Ponderosa Pine	-
% of trees with exfoliating bark		0	

1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%

Size composition of live trees (%)	Small (3-8 in.)	Med. (9-15 in.)	Large (>15 in.)
	50	50	

Total # of suitable snags 0

☑ No Forest Resources

(Suitable snags are standing dead trees with exfoliating bark, cracks, crevices or hollows.)

Conclusion

IS THE HABITAT SUITABLE FOR NORTHERN LONG-EARED BATS? No

Additional comments:

Northern long-eared bat habitat is presumed to not be present due to the area having limited amount of suitable trees and being near a high traffic area. No exfoliating bark or snags were present.

Representative photos for Sample Site 2 are included below.

Attach aerial map of project site with all forested areas labeled and a general description of the habitat.

Photographic documentation should include: habitat shots at edge and interior from multiple locations; canopy, midstory, understory; examples of potential suitable snags and live trees; and water resources.

Northern Long-Eared Bat Habitat Assessment Data Sheet (continued)

Additional information about discreet habitat types at multiple sites

Use additional sheets to assess discrete habitat types at multiple sites in a project area. Include a map depicting sample sites in project area. A single sheet can be used for multiple sample sites if the habitat is the same.

Sample Site Description (Station # / MRM#)

Sample site no. 3

Sample site no.

Water Resources at Sample Site

Stream type (# and length in FT)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources
Pools/ponds (# and size in acres)		Open and accessible to bats?		○ _____ provides potential summer water source.
		N/A		
Wetlands (Approx. acres)	Permanent		Seasonal	◉ No Water Source

Forest Resources at Sample Site

	Canopy (>50')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Closure/density (Use 1-6 from far right table)			1	
Dominant species of mature trees	-	-	Other Deciduous	
% of trees with exfoliating bark			0	

	Small (3-8 in.)	Med. (9-15 in.)	Large (>15 in.)
Size composition of live trees (%)	100		

Total # of suitable snags 0

☑ No Forest Resources

(Suitable snags are standing dead trees with exfoliating bark, cracks, crevices or hollows.)

Conclusion

IS THE HABITAT SUITABLE FOR NORTHERN LONG-EARED BATS? No

Additional comments:

Northern long-eared bat habitat is presumed to not be present due to the area having limited amount of suitable trees and being near a high traffic area. No exfoliating bark or snags were present.

Representative photos for Sample Site 3 are included below.

Attach aerial map of project site with all forested areas labeled and a general description of the habitat.

Photographic documentation should include: habitat shots at edge and interior from multiple locations; canopy, midstory, understory; examples of potential suitable snags and live trees; and water resources.

Northern Long-Eared Bat Habitat Assessment Data Sheet (continued)

Additional information about discreet habitat types at multiple sites

Use additional sheets to assess discrete habitat types at multiple sites in a project area. Include a map depicting sample sites in project area. A single sheet can be used for multiple sample sites if the habitat is the same.

Sample Site Description (Station # / MRM#)

Sample site no. 4

Sample site no.

Water Resources at Sample Site

Stream type (# and length in FT)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources
Pools/ponds (# and size in acres)		Open and accessible to bats?		○ _____ provides potential summer water source.
		N/A		
Wetlands (Approx. acres)	Permanent		Seasonal	◉ No Water Source

Forest Resources at Sample Site

	Canopy (>50')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Closure/density (Use 1-6 from far right table)			1	
Dominant species of mature trees	-	-	Other Deciduous	
% of trees with exfoliating bark				

	Small (3-8 in.)	Med. (9-15 in.)	Large (>15 in.)
Size composition of live trees (%)	100		

Total # of suitable snags 0

☑ No Forest Resources

(Suitable snags are standing dead trees with exfoliating bark, cracks, crevices or hollows.)

Conclusion

IS THE HABITAT SUITABLE FOR NORTHERN LONG-EARED BATS? No

Additional comments:

Northern long-eared bat habitat is presumed to not be present due to the area having limited amount of suitable trees and being near a high traffic area. No exfoliating bark or snags were present.

Representative photos for Sample Site 4 are included below.

Attach aerial map of project site with all forested areas labeled and a general description of the habitat.

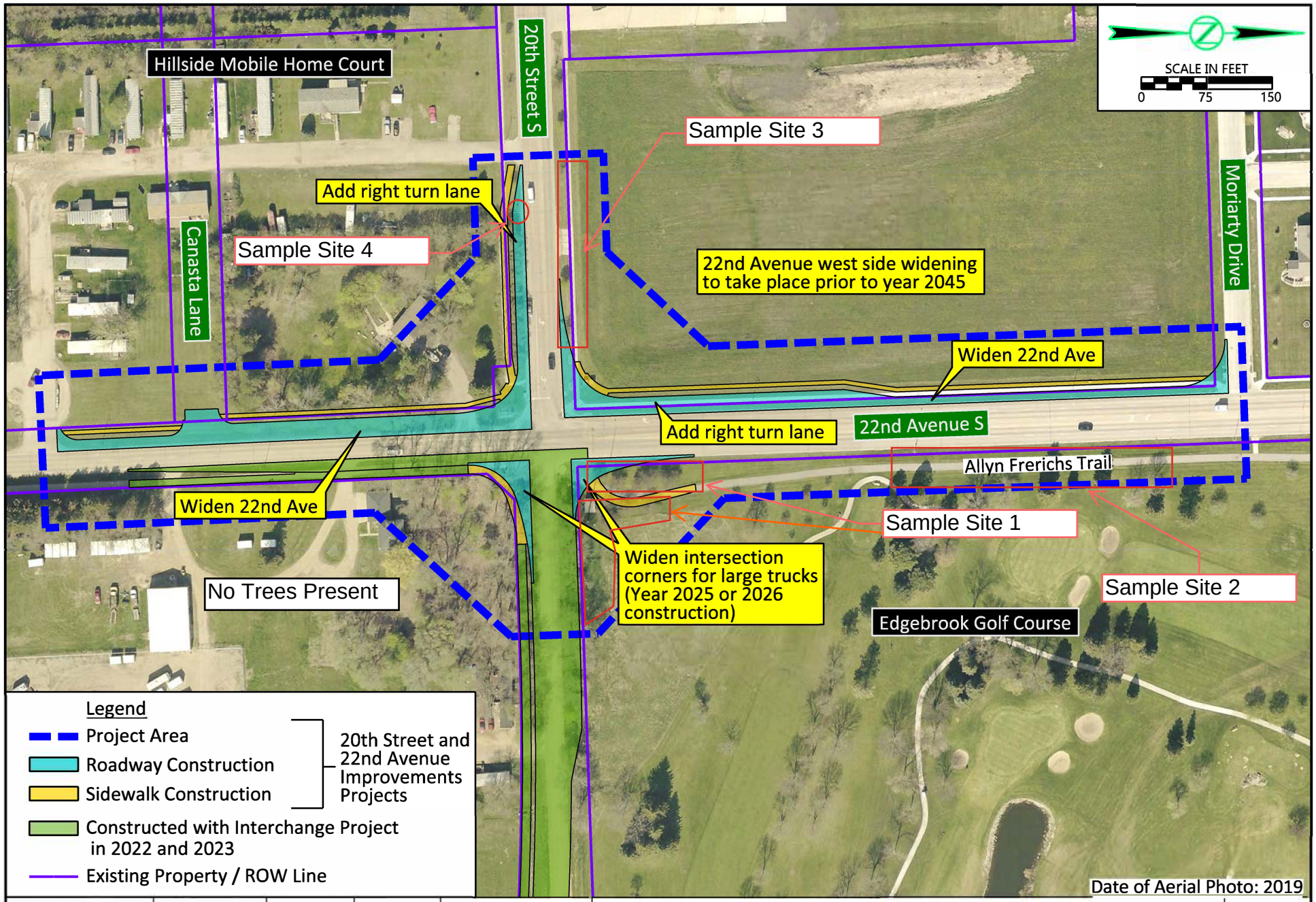
Photographic documentation should include: habitat shots at edge and interior from multiple locations; canopy, midstory, understory; examples of potential suitable snags and live trees; and water resources.

Representative Photos for Sample Site #1, located East of 22nd Avenue South Along Allyn Frerichs Trail and north of 20th Street South.

Representative Photos for Sample Site #2, located East of 22nd Avenue South Along Allyn Frerichs Trail.

Representative Photos for Sample Site #3, located North of 20th Street South.

Representative for Sample Site #4, located south of 20th Street South.



Drawn By: B.Miller
Date: 9/6/2024
Chked By: J.Unruh
Date: 9/6/2024
Revision:

Project Area for 20th Street / 22nd Avenue Intersection Expansion and Widening

I-29 Exit 130 (20th Street S) Interchange PCN 020V

Brookings, SD

Figure 2

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Dakota Ecological Services Field Office
420 South Garfield Avenue, Suite 400
Pierre, SD 57501-5408
Phone: (605) 224-8693 Fax: (605) 224-1416

In Reply Refer To: 12/10/2024 19:04:27 UTC
Project code: 2025-0023938
Project Name: I-29 Exit 130 Interchange (20th St./22nd Ave)-Brookings County

Subject: Consistency letter for the 'I-29 Exit 130 Interchange (20th St./22nd Ave)-Brookings County' project under the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (NLEB).

To whom it may concern:

The U.S. Fish and Wildlife Service (Service) has received your request dated December 10, 2024 to verify that the **I-29 Exit 130 Interchange (20th St./22nd Ave)-Brookings County** (Proposed Action) may rely on the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (PBO) to satisfy requirements under section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 *et seq.*).

Based on the information you provided (Project Description shown below), you have determined that the Proposed Action will have no effect on the endangered Indiana bat (*Myotis sodalis*) or the endangered northern long-eared bat (*Myotis septentrionalis*). If the Proposed Action is not modified, **no consultation is required for these two species.** If the Proposed Action is modified, or new information reveals that it may affect the Indiana bat and/or northern long-eared bat in a manner or to an extent not considered in the PBO, further review to conclude the requirements of ESA section 7(a)(2) may be required.

For Proposed Actions that include bridge/culvert or structure removal, replacement, and/or maintenance activities:
If your initial bridge/culvert or structure assessment failed to detect Indiana bats and/or NLEBs use or occupancy, yet later detected prior to, or during construction, please submit the Post Assessment Discovery of Bats at Bridge/Culvert or Structure Form (User Guide Appendix E) to this Service Office within 2 working days of the incident. In these instances, potential incidental take of Indiana bats and/or NLEBs may be exempted provided that the take is reported to the Service.

If the Proposed Action may affect any other federally-listed or proposed species and/or designated critical habitat, additional consultation between the lead Federal action agency and this Service Office is required. If the proposed action has the potential to take bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act may also be required. In either of these circumstances, please advise the lead Federal action agency accordingly.

The following species may occur in your project area and **are not** covered by this determination:

- Dakota Skipper *Hesperia dacotae* Threatened
- Monarch Butterfly *Danaus plexippus* Candidate
- Rufa Red Knot *Calidris canutus rufa* Threatened
- Topeka Shiner *Notropis topeka (=tristis)* Endangered
- Western Prairie Fringed Orchid *Platanthera praeclara* Threatened
- Western Regal Fritillary *Argynnis idalia occidentalis* Proposed Threatened

PROJECT DESCRIPTION

The following project name and description was collected in IPaC as part of the endangered species review process.

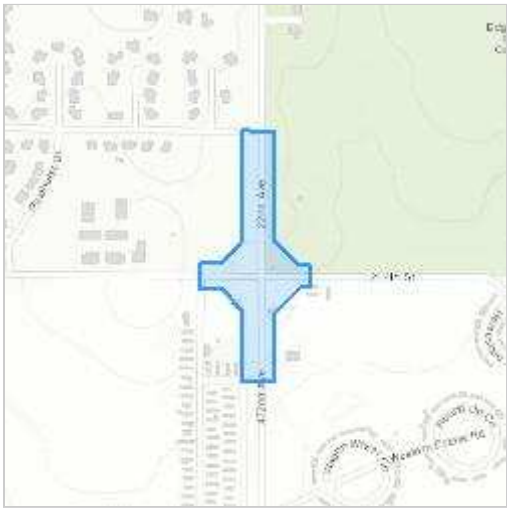
NAME

I-29 Exit 130 Interchange (20th St./22nd Ave)-Brookings County

DESCRIPTION

The South Dakota Department of Transportation is proposing improvements to the intersection of 20th Street and 22nd Avenue, this area is associated with I-29 Exit 130. In an initial EA was previously developed, the SDDOT is in the process of developing a supplemental EA for this project. This Supplemental EA is to evaluate the reconstruction of the 20th Street and 22nd Avenue intersection to improve the turning radius.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@44.282718200000005,-96.76842621311076,14z



DETERMINATION KEY RESULT

Based on the information you provided, you have determined that the Proposed Action will have no effect on the endangered Indiana bat and/or the endangered northern long-eared bat. Therefore, no consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required for these two species.

QUALIFICATION INTERVIEW

1. Is the project within the range of the Indiana bat[1]?

   [1] See Indiana bat species profile

   Automatically answered
   No

2. Is the project within the range of the northern long-eared bat[1]?

   [1] See northern long-eared bat species profile

   Automatically answered
   Yes

3. Which Federal Agency is the lead for the action?

   A) Federal Highway Administration (FHWA)

4. Are *all* project activities limited to non-construction[1] activities only? (examples of non-construction activities include: bridge/abandoned structure assessments, surveys, planning and technical studies, property inspections, and property sales)

   [1] Construction refers to activities involving ground disturbance, percussive noise, and/or lighting.

   No

5. Does the project include *any* activities that are **greater than** 300 feet from existing road/rail surfaces[1]?

   [1] Road surface is defined as the actively used [e.g. motorized vehicles] driving surface and shoulders [may be pavement, gravel, etc.] and rail surface is defined as the edge of the actively used rail ballast.

   No

6. Does the project include *any* activities **within** 0.5 miles of a known Indiana bat and/or NLEB hibernaculum[1]?

   [1] For the purpose of this consultation, a hibernaculum is a site, most often a cave or mine, where bats hibernate during the winter (see suitable habitat), but could also include bridges and structures if bats are found to be hibernating there during the winter.

   No

7. Is the project located **within** a karst area?

   No

8. Is there *any* suitable[1] summer habitat for Indiana Bat or NLEB **within** the project action area[2]? (includes any trees suitable for maternity, roosting, foraging, or travelling habitat)

   [1] See the Service's summer survey guidance for our current definitions of suitable habitat.

   [2] The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR Section 402.02). Further clarification is provided by the User's Guide for the Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat.

   No

9. Does the project include wetland or stream protection activities associated with compensatory wetland mitigation?

   No

10. Does the project include slash pile burning?

    No

11. Does the project include *any* bridge removal, replacement, and/or maintenance activities (e.g., any bridge repair, retrofit, maintenance, and/or rehabilitation work)?

    No

12. Does the project include the removal, replacement, and/or maintenance of *any* structure other than a bridge? (e.g., rest areas, offices, sheds, outbuildings, barns, parking garages, etc.)

    Yes

13. Is there *any* suitable habitat[1] for Indiana bat or NLEB **within** 1,000 feet of the structure? (includes any trees suitable for maternity, roosting, foraging, or travelling habitat)

    [1] See the Service's current summer survey guidance for our current definitions of suitable habitat.

    No

14. Will the project involve the use of **temporary** lighting *during* the active season?

    No

15. Will the project install new or replace existing **permanent** lighting?

    Yes

16. Is there *any* suitable habitat **within** 1,000 feet of the location(s) where **permanent** lighting will be installed or replaced?

    No

17. Does the project include percussives or other activities (**not including tree removal/ trimming or bridge/structure work**) that will increase noise levels above existing traffic/ background levels?

    Yes

18. Will the activities that use percussives (**not including tree removal/trimming or bridge/ structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the active season[1]?

    [1] Coordinate with the local Service Field Office for appropriate dates.

    Yes

19. Will *any* activities that use percussives (**not including tree removal/trimming or bridge/ structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the inactive season[1]?

    [1] Coordinate with the local Service Field Office for appropriate dates.

    Yes

20. Are *all* project activities that are **not associated with** habitat removal, tree removal/ trimming, bridge and/or structure activities, temporary or permanent lighting, or use of percussives, limited to actions that DO NOT cause any additional stressors to the bat species?

    Examples: lining roadways, unlighted signage , rail road crossing signals, signal lighting, and minor road repair such as asphalt fill of potholes, etc.

    Yes

21. Will the project raise the road profile **above the tree canopy**?

    No

22. Is the location of this project consistent with a No Effect determination in this key?

    Automatically answered
    Yes, because the project action area is not within suitable Indiana bat and/or NLEB summer habitat and is outside of 0.5 miles of a hibernaculum.

23. Is the structure removal, replacement, or maintenance activities portion of this project consistent with a No Effect determination in this key?

    Automatically answered
    Yes, because the structure is more than 1,000 feet from the nearest suitable habitat and is therefore considered unsuitable for use by bats

24. Is the permanent lighting portion of this project consistent with a No Effect determination in this key?

    Automatically answered
    Yes, because the lighting will be more than 1,000 feet from the nearest suitable habitat

DETERMINATION KEY DESCRIPTION: FHWA, FRA, FTA PROGRAMMATIC CONSULTATION FOR TRANSPORTATION PROJECTS AFFECTING NLEB OR INDIANA BAT

This key was last updated in IPaC on November 04, 2024. Keys are subject to periodic revision.

This decision key is intended for projects/activities funded or authorized by the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and/or Federal Transit Administration (FTA), which may require consultation with the U.S. Fish and Wildlife Service (Service) under Section 7 of the Endangered Species Act (ESA) for the endangered **Indiana bat** (*Myotis sodalis*) and the endangered **northern long-eared bat** (NLEB) (*Myotis septentrionalis*).

This decision key should only be used to verify project applicability with the Service's amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects. The programmatic biological opinion covers limited transportation activities that may affect either bat species, and addresses situations that are both likely and not likely to adversely affect either bat species. This decision key will assist in identifying the effect of a specific project/activity and applicability of the programmatic consultation. The programmatic biological opinion is not intended to cover all types of transportation actions. Activities outside the scope of the programmatic biological opinion, or that may affect ESA-listed species other than the Indiana bat or NLEB, or any designated critical habitat, may require additional ESA Section 7 consultation.

IPAC USER CONTACT INFORMATION

Agency: South Dakota Department of Transportation
Name: Emma Koeckeritz
Address: 51 North Broadway Suite 550
City: Fargo
State: ND
Zip: 58102
Email ekoeckeritz@hdrinc.com
Phone: 7015529946

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Highway Administration
Name: Chad Babcock
Email: Chad.Babcock@state.sd.us
Phone: 6057733721

SDGFP Coordination

DEPARTMENT OF TRANSPORTATION

Planning and Engineering
Environmental Office
700 E Broadway Avenue
Pierre, SD 57501-2586
O: 605.773.4336
dot.sd.gov

November 4, 2024

John Kanta, Administrator
SD Dept. of Game, Fish & Parks
4130 Adventure Trail
Rapid City, SD 57702

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (EA)
Improvements at 20th Street South and 22nd Avenue South

Dear Mr. Kanta:

We have previously coordinated with your agency for the completion of the 2020 Environmental Assessment (EA) for this project. The original project was the construction of a new interchange at Exit 130 within the City of Brookings and expansion of one mile of existing 20th Street South from a dead-end gravel road to a three-lane urban roadway with an adjacent shared use path. The project was construction in 2022 and 2023 and opened to traffic on July 29, 2023. Attached Figure 1 provides the area of the overall interchange project.

Due to timeframe, existing utilities, and Section 6(f) property constraints, the east-side corners of the 20th Street South/22nd Avenue South intersection were constructed to a substandard design that limited large truck movements. As a follow-up to the interchange project, SDDOT and the City of Brookings proposed to expand the intersection corners to better accommodate large trucks. A funding source has been identified for this follow-up project and construction is anticipated for the summer of 2025. This will involve acquisition of permanent right-of-way (ROW) for roadway purposes and temporary construction easement on the southwest corner of Edgebrook Golf course. The expanded intersection would require reconstruction of a portion of the Allyn Frerichs Trail. Future widening (by year 2045) of 20th Street South and 22nd Avenue South are also part of this environmental analysis. Figure 2 illustrates the specific area for which we request your review and comments at this time.

Attached is information on the above project. Please comment on any of the following topics that pertain to your agency:

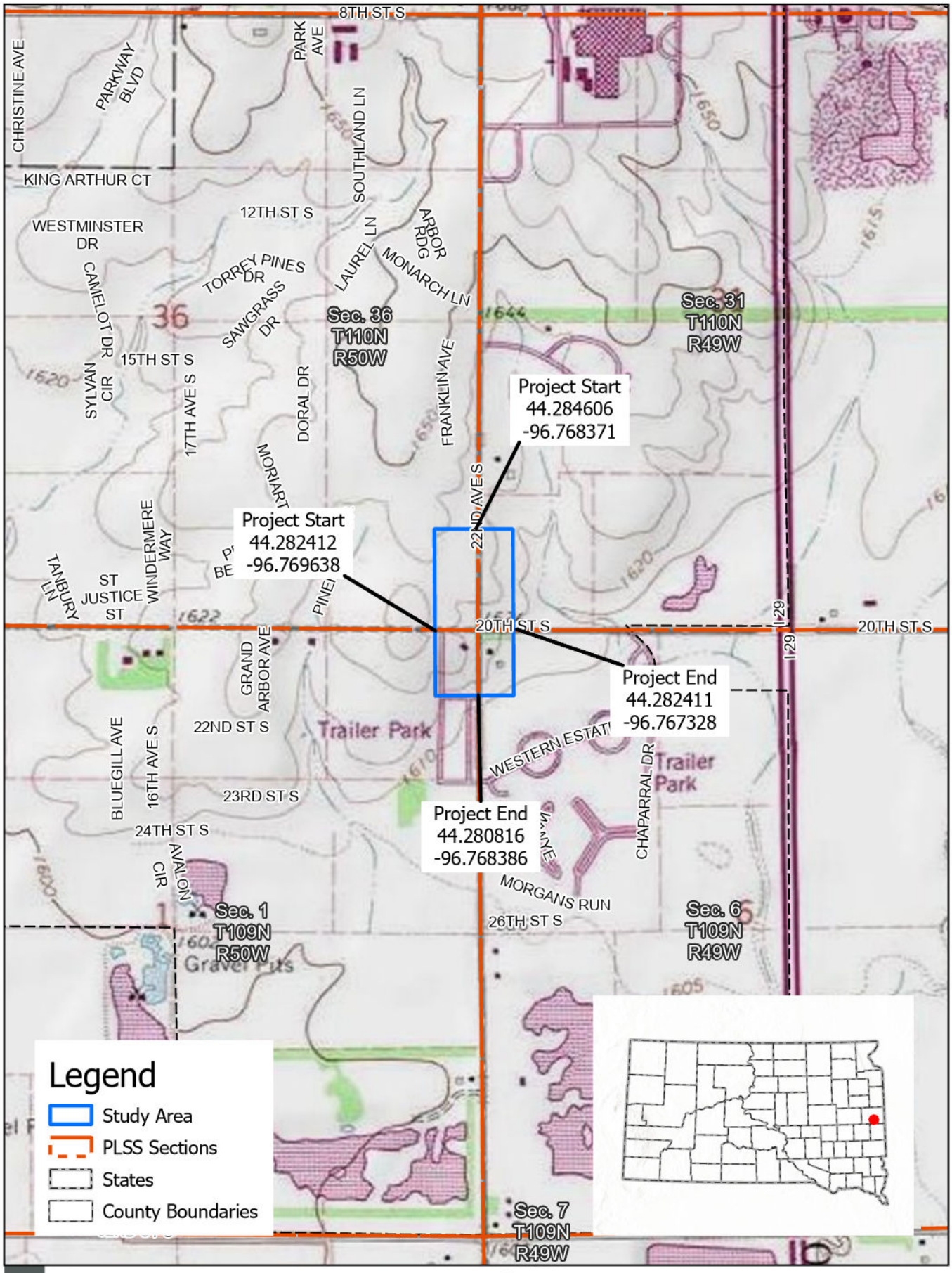
1. Wetland Locations	5. SDGF&P Recreation Areas
2. Threatened or Endangered Species	6. Parks
3. Refuges	7. Land & Water Conservation Funds
4. SDGF&P Game Production Areas	8. Aquatic Invasive Species

Please submit your comments as soon as possible, so that the project's environmental documentation can be completed, and the project can be let and constructed in a timely manner.

Sincerely,

Chad Babcock
Environmental Manager
605.773.3721

Attachment



HDR brookings SD DOT

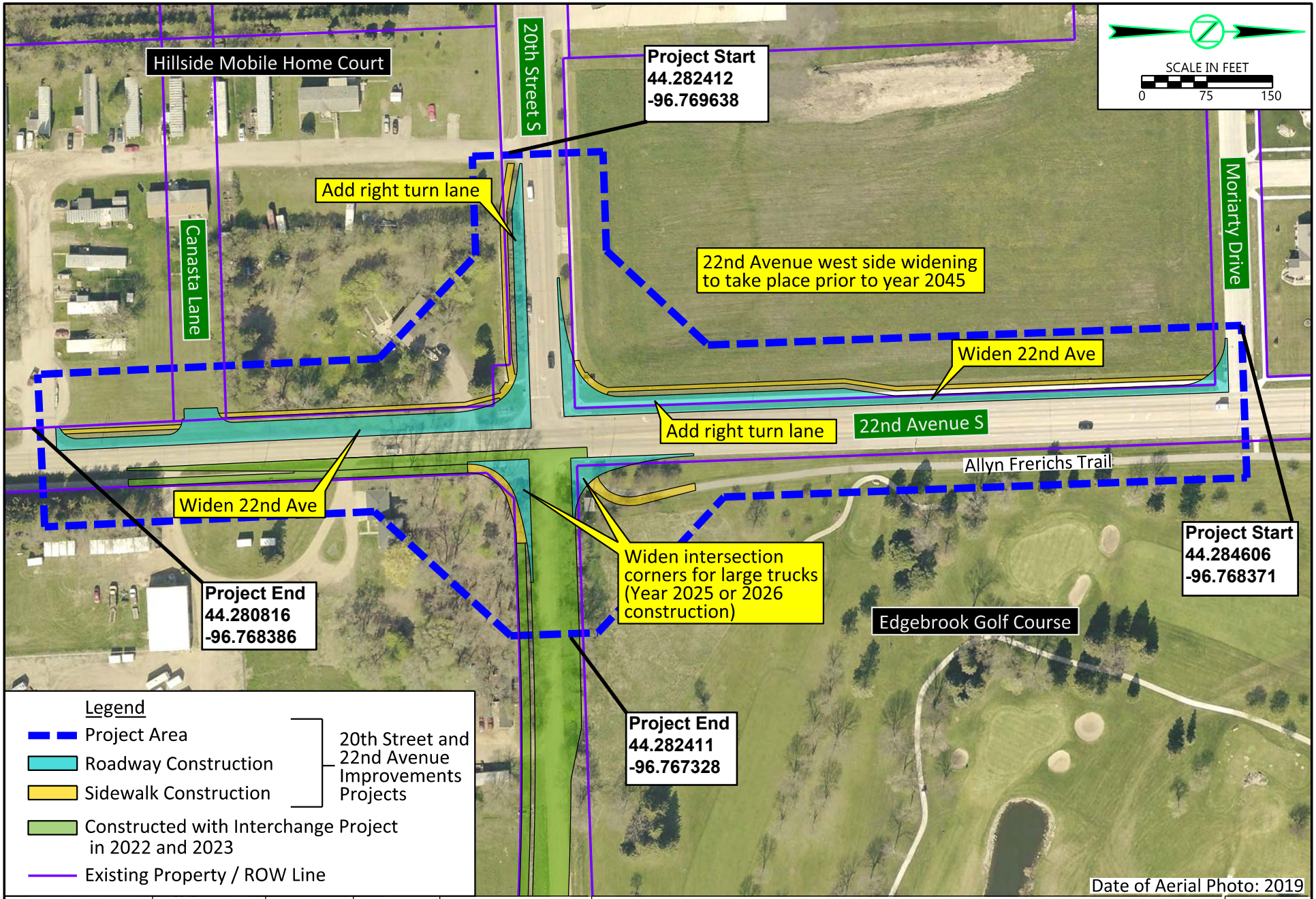
0 800 US Feet

PROJECT LOCATION MAP

EM 0295(45) 130, PCN 020V, Brookings County

FIGURE 1

Y:\PROJECTS\CITY_OF_BROOKINGS\20THST_EXPANSION\7.2_WIP\APRX\BROOKINGS_20THSTEXPANSION.APRX DATE: 9/4/2024



Drawn By: B.Miller
Date: 9/6/2024
Chked By: J.Unruh
Date: 9/6/2024
Revision:

Project Area for 20th Street / 22nd Avenue Intersection Expansion and Widening

I-29 Exit 130 (20th Street S) Interchange PCN 020V — Brookings, SD

Figure 2

DEPARTMENT OF TRANSPORTATION

Planning and Engineering
Environmental Office
700 E Broadway Avenue
Pierre, SD 57501-2586
O: 605.773.4336
dot.sd.gov

November 4, 2024

Adam Kulesa, Planning/Development Administrator
SD Dept. of Game, Fish & Parks
523 E Capitol
Pierre, SD 57501

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (EA)
Improvements at 20th Street South and 22nd Avenue South

Dear Mr. Kulesa:

We have previously coordinated with your agency for the completion of the 2020 Environmental Assessment (EA) for this project. The original project was the construction of a new interchange at Exit 130 within the City of Brookings and expansion of one mile of existing 20th Street South from a dead-end gravel road to a three-lane urban roadway with an adjacent shared use path. The project was construction in 2022 and 2023 and opened to traffic on July 29, 2023. Attached Figure 1 provides the area of the overall interchange project.

Due to timeframe, existing utilities, and Section 6(f) property constraints, the east-side corners of the 20th Street South/22nd Avenue South intersection were constructed to a substandard design that limited large truck movements. As a follow-up to the interchange project, SDDOT and the City of Brookings proposed to expand the intersection corners to better accommodate large trucks. A funding source has been identified for this follow-up project and construction is anticipated for the summer of 2025. This will involve acquisition of permanent right-of-way (ROW) for roadway purposes and temporary construction easement on the southwest corner of Edgebrook Golf course. The expanded intersection would require reconstruction of a portion of the Allyn Frerichs Trail. Future widening (by year 2045) of 20th Street South and 22nd Avenue South are also part of this environmental analysis. Figure 2 illustrates the specific area for which we request your review and comments at this time.

Attached is information on the above project. Please comment on any of the following topics that pertain to your agency:

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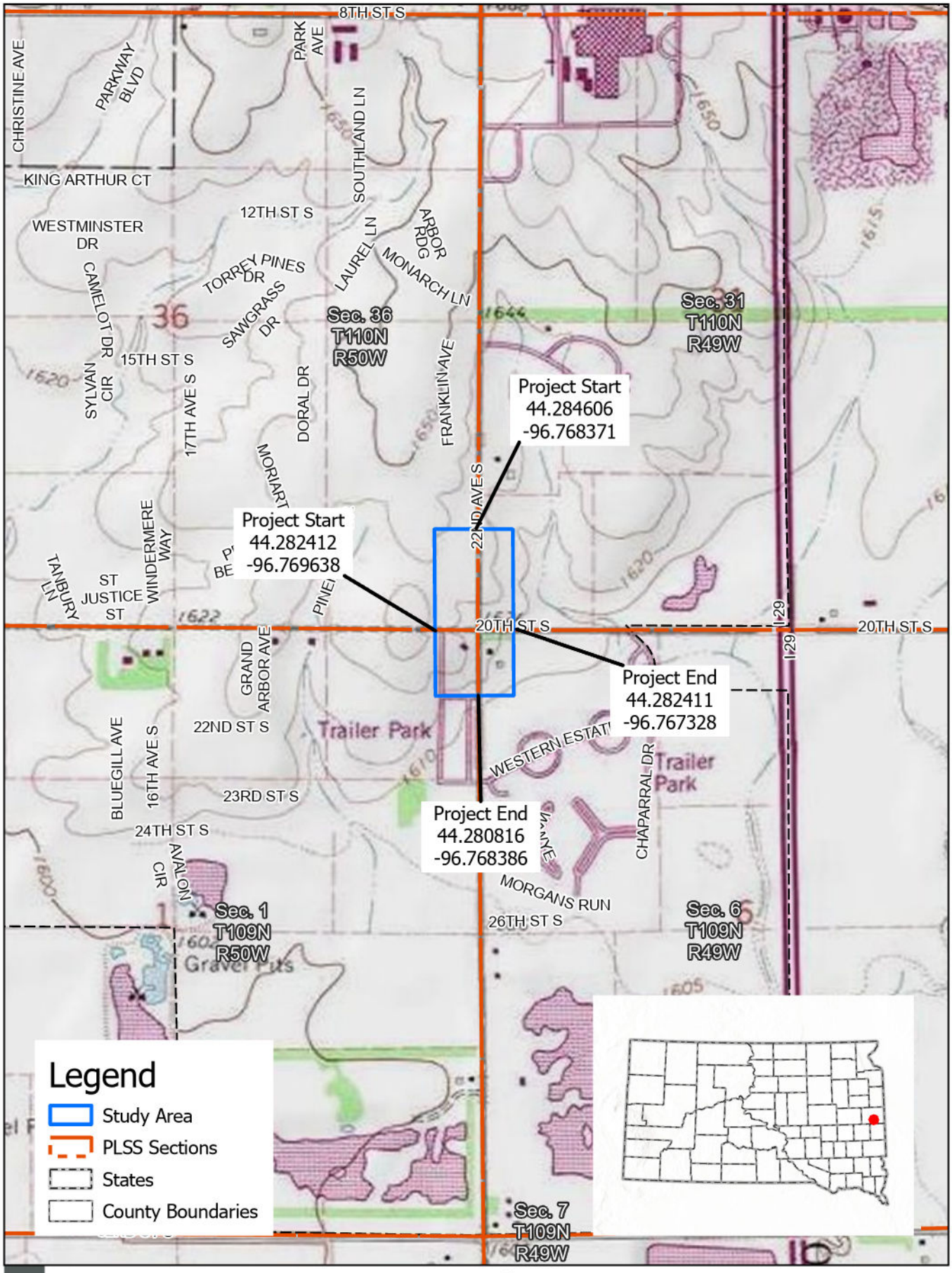
4. SDGF&P Game Production Areas	8. Aquatic Invasive Species

Please submit your comments as soon as possible, so that the project's environmental documentation can be completed, and the project can be let and constructed in a timely manner.

Sincerely,

Chad Babcock
Environmental Manager
605.773.3721

Attachment



HDR brookings SD DOT

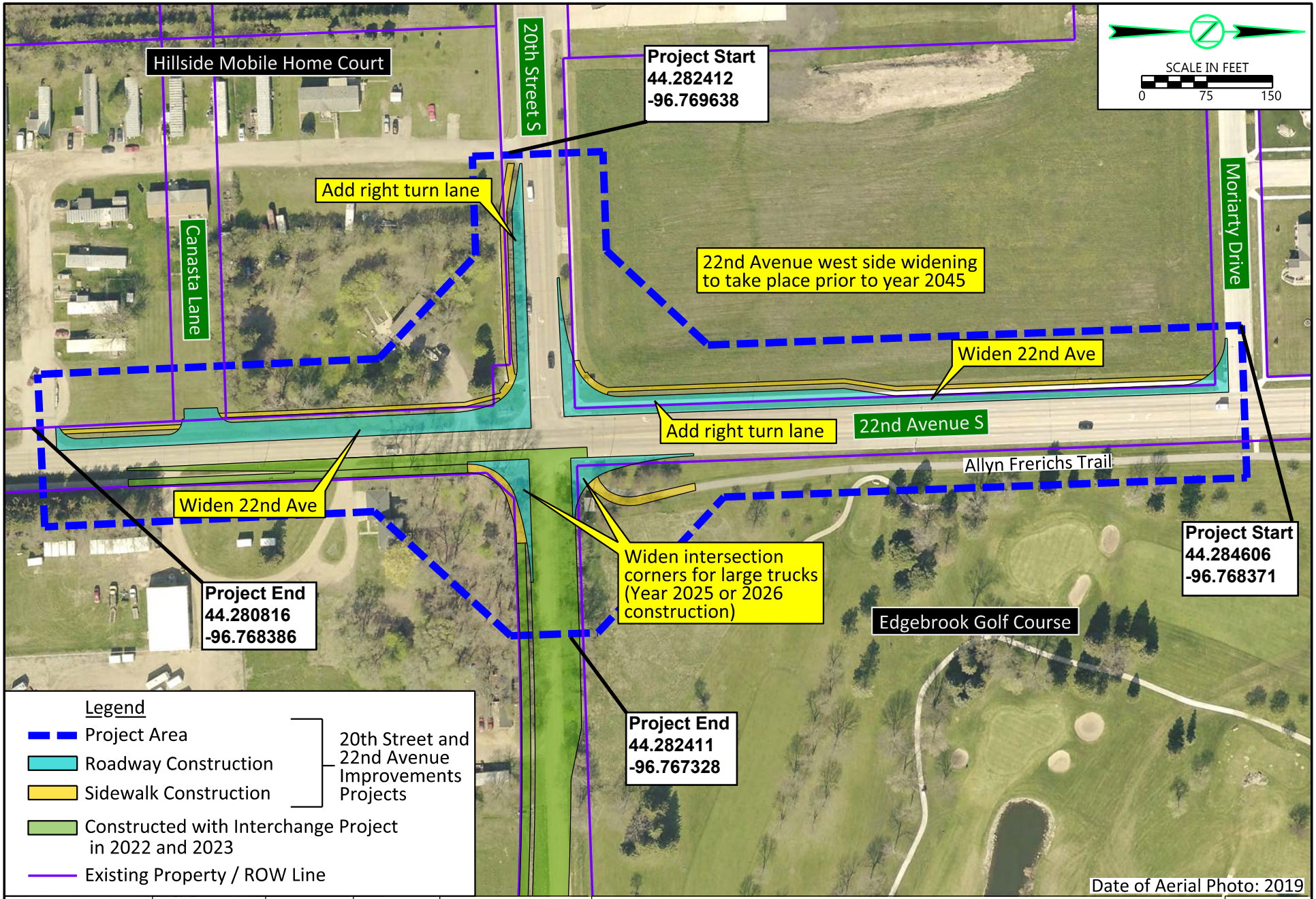
0 800 US Feet

PROJECT LOCATION MAP

EM 0295(45) 130, PCN 020V, Brookings County

FIGURE 1

Y:\PROJECTS\CITY_OF_BROOKINGS\20THST_EXPANSION\7.2_WIP\APRX\BROOKINGS_20THSTEXPANSION.APRX DATE: 9/4/2024



Drawn By: B.Miller
Date: 9/6/2024
Chked By: J.Unruh
Date: 9/6/2024
Revision:

Project Area for 20th Street / 22nd Avenue Intersection Expansion and Widening

I-29 Exit 130 (20th Street S) Interchange PCN 020V — Brookings, SD

Figure 2

Environmental Review Report

Project Information

Report Generation Date:	12/23/2024 11:23:26 AM
Project ID:	2024-12-23-1886
Project Title:	I-29 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (EA)
User Project Number(s):	
Project Type:	Transportation, Roads/Bridges/Trails
Project Activities:	Curb and Gutter Lighting Paving Resurfacing Sidewalk Trails
County(s):	Brookings
Township/Range/Section(s):	109N049W6; 109N050W1; 110N049W31; 110N050W36
Watershed(s) HUC8:	None
Latitude/Longitude:	44.282631 / -96.768457

Contact Information

Organization:	HDR
Contact Name:	Michaela Carlson
Contact Phone:	6057828101
Contact Email:	michaela.carlson@hdrinc.com
Contact Address:	101 S. Phillips Ave. Suite 401 Sioux Falls SD 57104
Submitted On Behalf Of:	

Project Description

We have previously coordinated with your agency for the completion of the 2020 Environmental Assessment (EA) for this project. The original project was the construction of a new interchange at Exit 130 within the City of Brookings and expansion of one mile of existing 20th Street South from a dead-end gravel road to a three-lane urban roadway with an adjacent shared use path. The project was construction in 2022 and 2023 and opened to traffic on July 29, 2023. Due to timeframe, existing utilities, and Section 6(f) property constraints, the east-side corners of the 20th Street South/22nd Avenue South intersection were constructed to a substandard design that limited large truck movements. As a follow-up to the interchange project, SDDOT and the City of Brookings proposed to expand the intersection corners to better accommodate large trucks. A funding source has been identified for this follow-up project and construction is anticipated for the summer of 2025. This will involve acquisition of permanent right-of-way (ROW) for roadway purposes and temporary construction easement on the southwest corner of Edgebrook Golf course. The expanded intersection would require reconstruction of a portion of the Allyn Frerichs Trail. Future widening (by year 2045) of 20th Street South and 22nd Avenue South are also part of this environmental analysis.

Introduction

The vision of South Dakota Department of Game, Fish and Parks (SDGFP) is to conserve our state's outdoor heritage to enhance the quality of life for current and future generations. SDGFP has a state-wide mission to serve and connect people and families to the outdoors through effective management of our state's parks, fisheries and wildlife resources. SDGFP strives to prevent or minimize unnecessary damage to species and their habitats by offering possible mitigation measures.

Disclaimer

The information provided in this report can only be used as a site clearance letter if no conflicts with sensitive wildlife resources were detected. This information provides an indication of whether or not public or protected lands and sensitive resources are known or likely to be located near the proposed project's location. **The information generated in this report does not replace Endangered Species Act consultation obligations with the U.S. Fish and Wildlife Service (USFWS) for federal listed species.**

A majority of the sensitive species records in the report originate from the South Dakota Natural Heritage Database (SDNHD). The SDNHD tracks species at risk and certain unique habitats. These species may be monitored because they are rare, indicative of a vulnerable habitat type, or are are legally designated as state or federal threatened or endangered species. Rare species are those that are declining and restricted to limited habitat, peripheral to a jurisdiction, isolated or disjunct due to geographic or climatic factors or classified as such due to lack of survey data. A list of monitored species can be found at https://gfp.sd.gov/natural-heritage-program/. Many places in South Dakota have not been surveyed for rare or protected species and habitats and the absence of a species from a proposed project area does not preclude its presence. **Accuracy of species lists, report information and project recommendations should be verified after 90 days**.

No environmental conflicts were detected by South Dakota Game, Fish and Parks for your proposed project. This report is considered final, and can serve as documentation for environmental clearance from South Dakota Game, Fish and Parks. This report does not replace coordination with the US Fish and Wildlife Service for Endangered Species Act compliance.

Project Type Recommendations
Due to the potential occurrence of federally endangered Northern Long-eared Bats (Myotis septentrionalis) in South Dakota, a survey should be conducted at bridge locations to confirm presence/absence of bats prior to any maintenance or replacement activities. If bats or bat activity is observed, please coordinate further with Game, Fish and Parks and the U.S. Fish and Wildlife Service.

In-Stream Activities
Any activities impacting streambeds should not be completed during fish spawning periods that take place from April through June outside of the Black Hills or from October through June within the Black Hills to avoid conflicts with spawning fish. Please contact Game, Fish and Parks if you wish to conduct work within the spawning period. Stream bottoms impacted by construction activities should be restored to pre-project elevations.

Revegetation

- Disturbance to native vegetation should be kept to a minimum.
- Any disturbed area should be revegetated using native seed sources.
    - The Natural Resources Conservation Service Plant Materials Center in Bismarck, ND may serve as a good source of information on which native plantings may be best suited to specific needs: https://www.nrcs.usda.gov/plant-materials/cp/releases
- Develop a long-term plan for preventing the introduction or establishment of non-native/invasive plants within the project area

Wetland and Riparian Area Disturbance

1. Disturbance to riparian and wetland areas should be kept to an absolute minimum.
2. If riparian vegetation is lost it should be quantified and replaced on site. Seeding of indigenous species should be accomplished immediately after construction to reduce sediment and erosion.
3. A site specific sediment and erosion control plan should be part of the project.
4. A post construction erosion control plan should be implemented in order to provide interim control prior to re-establishing permanent vegetative cover on the disturbed site.

If wetland areas are encountered by the project we first recommend avoidance, followed by minimization of impacts followed by mitigation (replacement of lost acres).

Legal Obligations

South Dakota Endangered and Threatened Species Law

This state law (Chapter 34A-8) defines nongame, threatened and endangered species and wildlife and describes the relevant authorities of the Game, Fish and Parks Secretary and Commission. The SDGFP Commission may list, delist or change the status of state threatened or endangered species. Take of state threatened or endangered species is prohibited except for certain, authorized purposes or to protect life or property. This state law also prohibits the reintroduction of a species on the federal list of threatened or endangered species that is considered extirpated from the state, unless authorized by the South Dakota Legislature. More information about obtaining a state endangered take authorization is available here: https://gfp.sd.gov/forms/endangeredspecies/

Aquatic Invasive Species

South Dakota Administrative Rule 41:10:04:02 forbids the possession and transport of aquatic invasive species (AIS). Any construction vehicles, vessels, or equipment that will come into contact with surface waters in South Dakota that have previously been used outside of the state or in and AIS positive water within South Dakota must be thoroughly power washed with hot water (>140°F) and completely dried for a minimum of 7 days prior to use. All attached dirt, mud debris and vegetation must be removed and all compartments and tanks capable of holding standing water shall be drained and dry. This applies, but is not limited to, all equipment, pumps, lines, hoses and holding tanks. The list of AIS positive waters is available at https://sdleastwanted.sd.gov/ or by calling 605-223-7706.

Federal Laws

The following federal laws contribute to the conservation and management of fish and wildlife resources in the United States: Endangered Species Act, Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, Clean Water Act, and the Fish and Wildlife Coordination Act. The National Environmental Policy Act (NEPA) requires compliance with these statutes and regulations.

Contact Information

U.S. Fish and Wildlife Service, Ecological Services Field Office
420 S. Garfield Ave, Suite 400
Pierre, South Dakota 57501
605-224-8693

U.S. Army Corp of Engineers, South Dakota Regulatory Office

28563 Powerhouse Road
Pierre, South Dakota 57501
605-224-8531

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. 668–668d) provides for the protection of the bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*). Under this federal act, “take of eagles, their parts, nests or eggs is prohibited unless a permit is issued for certain purposes and under certain circumstances as long as the authorized take is compatible with the preservation of eagles. Disturbance resulting in injury, decreased productivity, or nest abandonment by substantially interfering with normal breeding, feeding or sheltering behavior is also considered take. Eagle nests are protected under this law, whether active or inactive. T**his report does not replace consultation with the USFWS regarding the protection of bald and golden eagles.**

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (16 U.S. C. 703-712) provides international protection to migratory bird species included in treaties among the United States, Great Britain, Mexico and Japan. This federal act prohibits the taking, killing, possession and transportation (among other actions) of migratory birds, their eggs, parts, and nests, unless specifically permitted by regulations. This act has no provisions for allowing unauthorized take. Work closely with the USFWS to identify protective measures to avoid migratory bird take. A list of migratory bird species protected under this act can be found at 50 CFR 10.13. Introduced bird species are not protected under this Act. **This report does not replace consultation with the USFWS regarding the protection of migratory bird species.**

Endangered Species Act

The Endangered Species Act (16 U.S.C. 1531–1544) provides protections for native plant and animal species that are in danger of becoming extinct. Under Section 9, it is unlawful for the “take” of a listed species. This is defined as “... to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct”. However, a permit may be issued for take that is the result of an otherwise legal activity. Please contact the USFWS to determine if a permit is needed.
The USFWS is in charge of the protection of listed species and their critical habitat. Similarly, other federal agencies are also directed to conserve listed species and ensure their actions do not jeopardize a listed species existence or destroy or adversely modify critical habitat. As such, under Section 7, federal agencies should consult with the USFWS to ensure compliance with this Act. **This report does not replace consultation with the USFWS regarding listed species**.

Clean Water Act

The intent of the Clean Water Act (33 U.S.C. 1251 et seq.) is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters”. We recommend that proper planning take place to first and foremost avoid impacts to wetlands, streams, and associated riparian corridors. If dredge or fill materials will be placed into waterways or wetlands, the U.S. Army Corps of Engineers Regulatory Office should be contacted to determine if a 404 permit is needed.

Fish and Wildlife Coordination Act

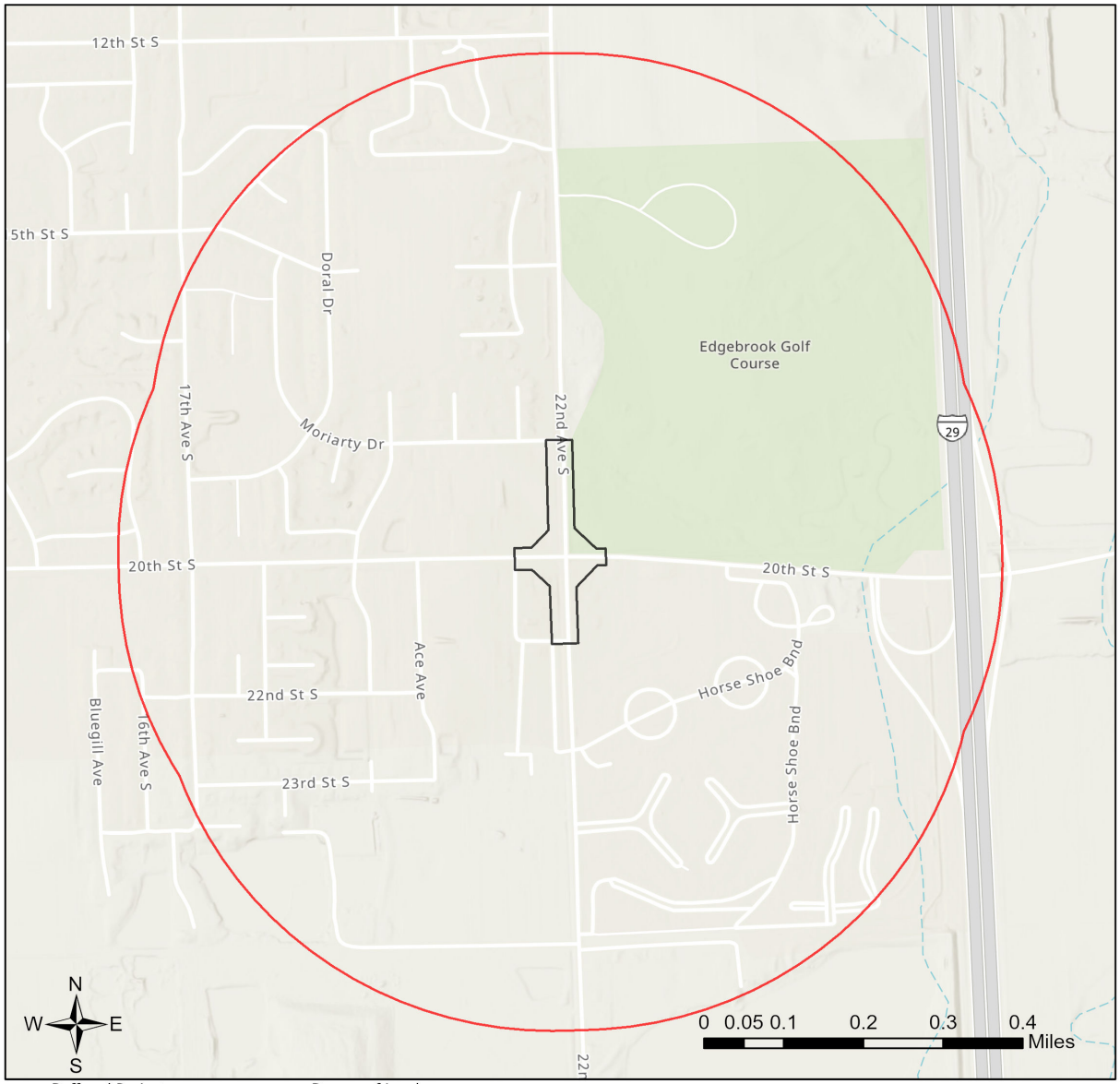
The Fish and Wildlife Coordination Act (15 U.S.C. 661-667e) provides habitat protection by requiring a federal agency to consult with the USFWS and SDGFP (i.e. the state fish and wildlife agency) whenever an agency is proposing to control or modify a stream or other body of water. The intent of this consultation is to conserve wildlife resources by preventing habitat loss or damage.

No Special Status Species were documented within the project vicinity.

No Protected Lands were detected within the project vicinity.

9 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (E

Topo Basemap with Land Ownership, Tribal Lands, and Locator Map



- Buffered Project Boundary
- Project Boundary
- Game Production Areas
- SD Parks and Rec Areas
- School and Public Lands
- The Nature Conservancy Lands
- National Forest
- National Grassland
- Bureau of Land Management
- Bureau of Reclamation
- Corps of Engineers
- National Fish Hatchery
- National Park Service
- USFWS Wildlife Refuge
- Waterfowl Production Area

Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS
Esri, NASA, NGA, USGS, FEMA
South Dakota Game, Fish and Parks

SHPO Concurrence

December 18, 2024

Andrea Bierle
South Dakota Department of Transportation
700 E Broadway Ave
Pierre, SD 57501

SECTION 106 PROJECT CONSULTATION
Project: 241213005F – Project EM 0295(45) 130, PCN 020V, Brookings County I-29 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (EA) Improvements at Intersection of 20th Street South and 22nd Avenue South
Location: Brookings
FHWA - Federal Highway Administration

Dear Andrea,

Thank you for the opportunity to comment on the above referenced project pursuant to 54 U.S.C. 306108, also known as Section 106 of the National Historic Preservation Act of 1966 (as amended). The South Dakota Office of the State Historic Preservation Officer (SHPO) concurs with your determination regarding the effect of the proposed undertaking on the non-renewable cultural resources of South Dakota.

On December 13, 2024, SHPO received your letter, SHPO project letter #200909001F, and a report titled "A Letter Report Addressing the Level III Cultural Resources Investigation for Proposed Supplemental EA for the I-29, Exit 130 Interchange in Brookings, South Dakota" prepared by Austin Buhta and Shae R. Pfenning of the Augustana University Archaeology Laboratory. Included in this report were efforts to identify cultural resources, maps showing the Area of Potential Effects (APE), and photographic overviews of the project area.

Based upon the information provided, the proposed undertaking is for improvements at the intersection of 20th Street South and 22nd Avenue South at the Interstate 29 Exit 130 in Brookings, South Dakota. This proposed undertaking was previously consulted on under SHPO project #200909001F. After reviewing the information provided against our records, no Historic Properties were identified within the APE. Therefore, SHPO concurs with your determination of "No Historic Properties Affected" for the proposed undertaking.

Changes in the location and/or nature of activities from those identified in your request will require the submission of additional documentation pertaining to the identification of historic properties, as described in 36 C.F.R. § 800.4, and/or the undertaking's effects on historic properties, as described in 36 C.F.R. § 800.11.

Concurrence of the SHPO does not relieve the federal agency official from consulting with other appropriate parties, as described in 36 C.F.R. § 800.2(c).

If historic properties are discovered or unanticipated effects on historic properties are found after the agency official has completed the Section 106 process, the agency official shall avoid, minimize or

mitigate the adverse effects to such properties and notify the SHPO and Indian tribes that might attach religious and cultural significance to the affected property within 48 hours of the discovery, pursuant to 36 C.F.R. § 800.13.

Should you require any additional information, please contact Jozef Lamfers at Jozef.Lamfers@state.sd.us or at 605-773-6004. Your concern for the non-renewable cultural heritage of our state is appreciated.

Sincerely,
Garry Guan
State Historic Preservation Officer

Jozef Lamfers
Review & Compliance Archaeologist

CC:
Cassie Vogt - Archaeological Research Center
Lynn Griffin - Archaeological Research Center
Megan Ostrenga Fabricius - Archaeological Research Center

Tribal Coordination

SD DEPARTMENT OF TRANSPORTATION

Planning and Engineering
Environmental Office
700 E Broadway Avenue
Pierre, SD 57501-2586
O: 605.773.4336
dot.sd.gov

November 4, 2024

Sebastian Lebeau, Archaeologist
Bureau of Indian Affairs
115 Fourth Ave SE, Suite 400, MC 208
Aberdeen, SD 57401-4384

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (EA)
Improvements at Intersection of 20th Street South and 22nd Avenue South

Dear Mr. Lebeau:

We have previously coordinated with your agency for the completion of the 2020 Environmental Assessment (EA) for this project. The original project was the construction of a new interchange at Exit 130 within the City of Brookings and expansion of one mile of existing 20th Street South from a dead-end gravel road to a three-lane urban roadway with an adjacent shared use path. The project was construction in 2022 and 2023 and opened to traffic on July 29, 2023. Attached Figure 1 provides the area of the overall interchange project.

Due to timeframe, existing utilities, and Section 6(f) property constraints, the east-side corners of the 20th Street South/22nd Avenue South intersection were constructed to a substandard design that limited large truck movements. As a follow-up to the interchange project, SDDOT and the City of Brookings proposed to expand the intersection corners to better accommodate large trucks. A funding source has been identified for this follow-up project and construction is anticipated for the summer of 2025. This will involve acquisition of permanent right-of-way (ROW) for roadway purposes and temporary construction easement on the southwest corner of Edgebrook Golf course. The expanded intersection would require reconstruction of a portion of the Allyn Frerichs Trail. Future widening (by year 2045) of 20th Street South and 22nd Avenue South are also part of this environmental analysis. Figure 2 illustrates the specific area for which we request your review and comments at this time.

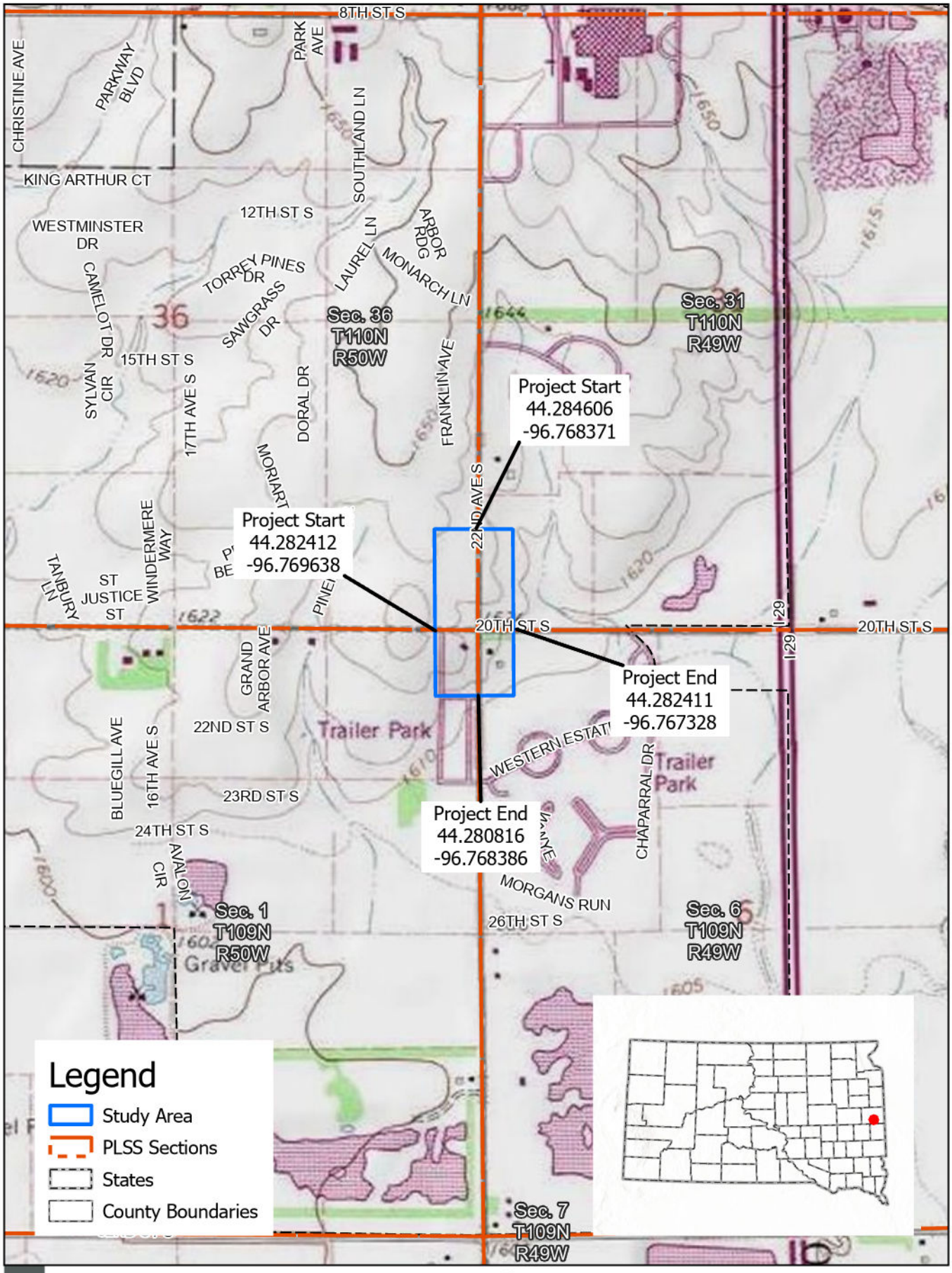
Pursuant to Section 106 of the National Historic Preservation Act (36 CFR Part 800), the South Dakota Department of Transportation, on behalf of the Federal Highway Administration – SD Division, is soliciting comments on this project from tribes that have expressed an interest in highway projects in Brookings County. Please provide your comments by November 30, 2024, so that the project can move toward a timely letting and construction.

If you have any questions, please feel free to contact me at the phone number or email address below, or you may contact Tom Lehmkuhl, FHWA Environmental Engineer, at (605) 776-1012.

Sincerely,

Chad Babcock
Environmental Manager
605.773.3721

Attachment



HDR brookings SD DOT

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PROJECT LOCATION MAP

EM 0295(45) 130, PCN 020V, Brookings County

FIGURE 1

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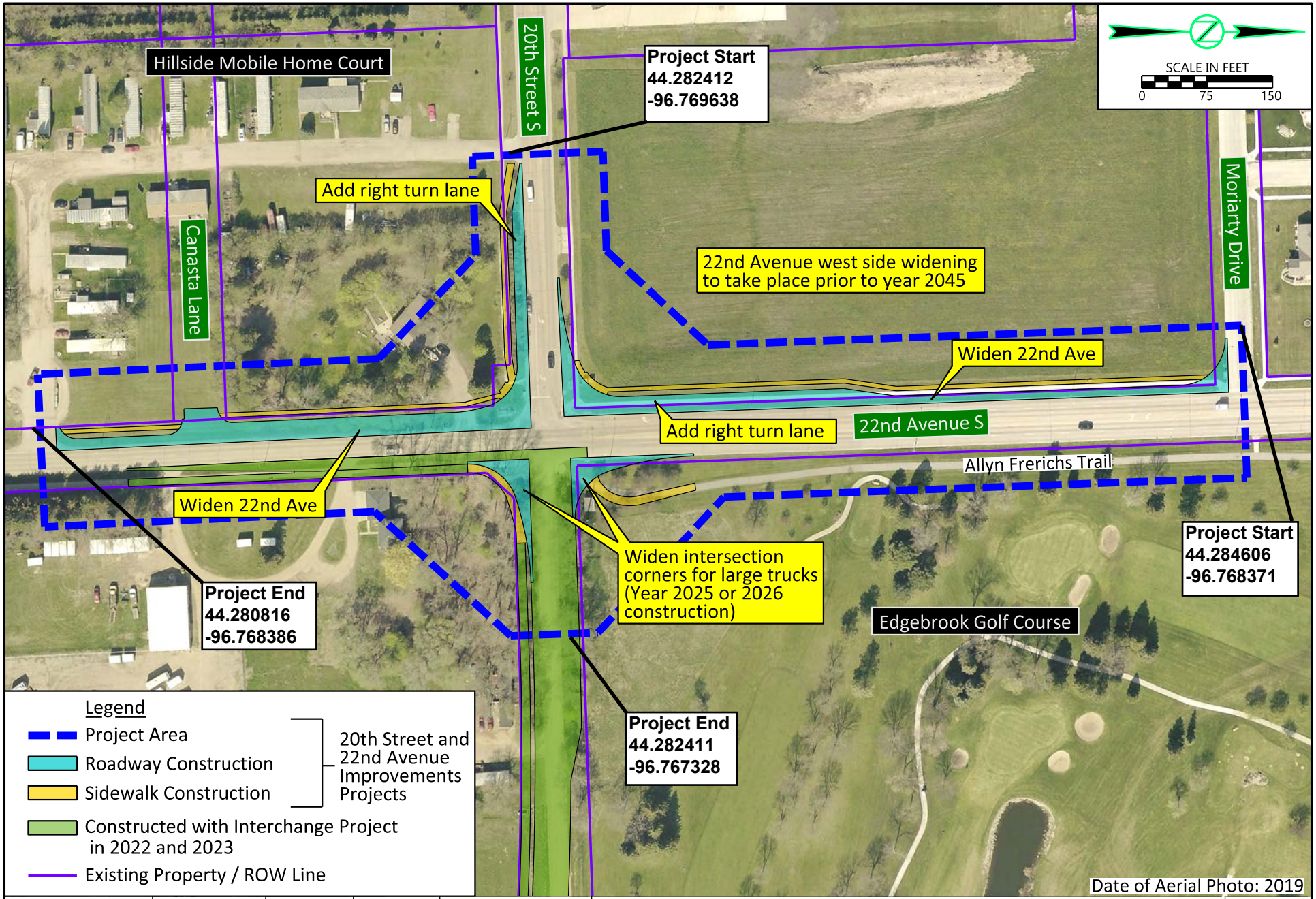


Drawn By: B.Miller
Date: 9/6/2024
Chked By: J.Unruh
Date: 9/6/2024
Revision:

Project Area for 20th Street / 22nd Avenue Intersection Expansion and Widening

I-29 Exit 130 (20th Street S) Interchange PCN 020V — Brookings, SD

Figure 2

DEPARTMENT OF TRANSPORTATION

Planning and Engineering
Environmental Office
700 E Broadway Avenue
Pierre, SD 57501-2586
O: 605.773.4336
dot.sd.gov

November 4, 2024

Merle Marks, Tribal Historic Preservation Officer
Crow Creek Sioux Tribe
PO Box 50
Ft. Thompson, SD 57339

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (EA)
Improvements at Intersection of 20th Street South and 22nd Avenue South

Dear Mr. Marks:

We have previously coordinated with your agency for the completion of the 2020 Environmental Assessment (EA) for this project. The original project was the construction of a new interchange at Exit 130 within the City of Brookings and expansion of one mile of existing 20th Street South from a dead-end gravel road to a three-lane urban roadway with an adjacent shared use path. The project was construction in 2022 and 2023 and opened to traffic on July 29, 2023. Attached Figure 1 provides the area of the overall interchange project.

Due to timeframe, existing utilities, and Section 6(f) property constraints, the east-side corners of the 20th Street South/22nd Avenue South intersection were constructed to a substandard design that limited large truck movements. As a follow-up to the interchange project, SDDOT and the City of Brookings proposed to expand the intersection corners to better accommodate large trucks. A funding source has been identified for this follow-up project and construction is anticipated for the summer of 2025. This will involve acquisition of permanent right-of-way (ROW) for roadway purposes and temporary construction easement on the southwest corner of Edgebrook Golf course. The expanded intersection would require reconstruction of a portion of the Allyn Frerichs Trail. Future widening (by year 2045) of 20th Street South and 22nd Avenue South are also part of this environmental analysis. Figure 2 illustrates the specific area for which we request your review and comments at this time.

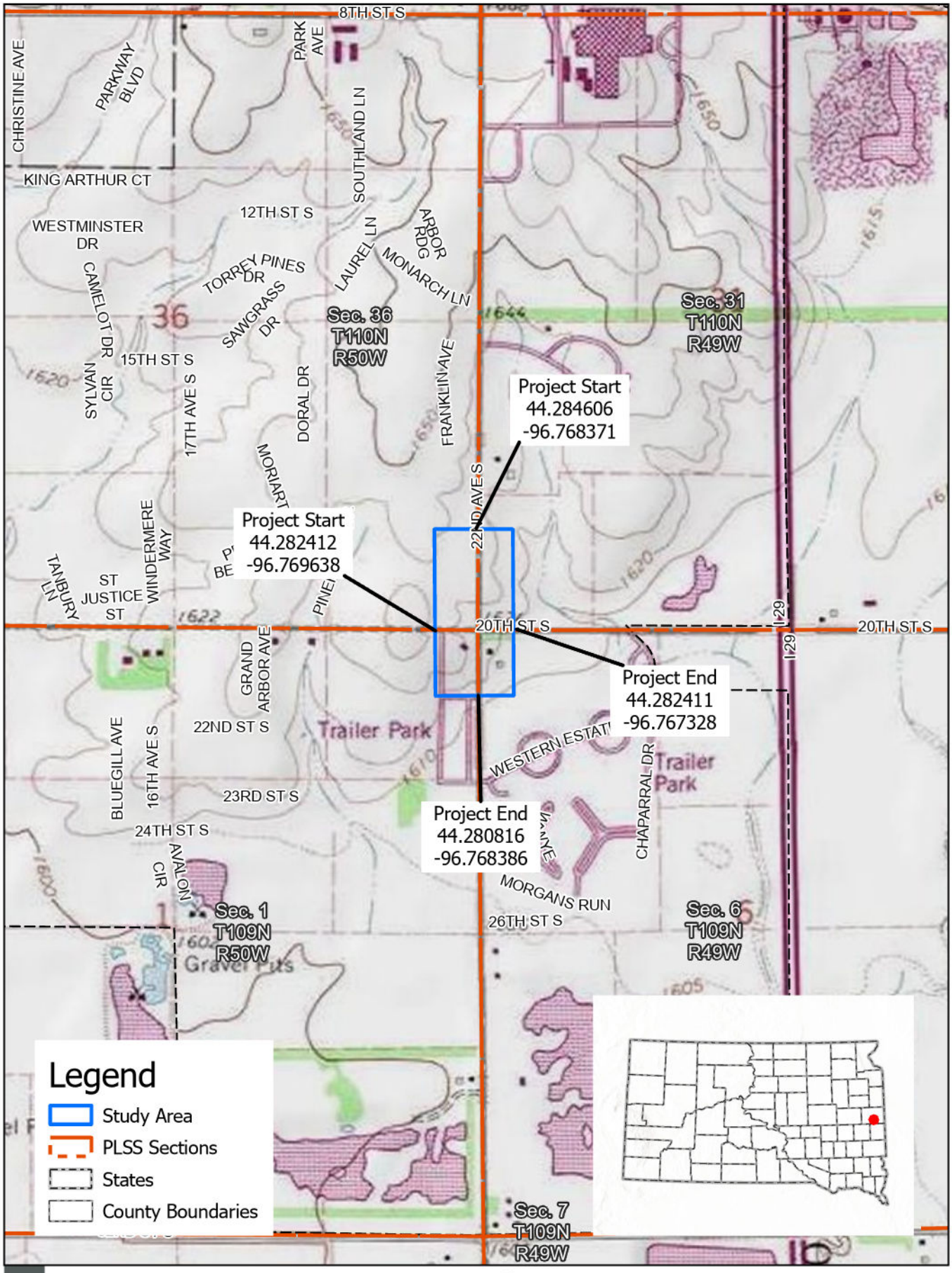
Pursuant to Section 106 of the National Historic Preservation Act (36 CFR Part 800), the South Dakota Department of Transportation, on behalf of the Federal Highway Administration – SD Division, is soliciting comments on this project from tribes that have expressed an interest in highway projects in Brookings County. Please provide your comments by November 30, 2024, so that the project can move toward a timely letting and construction.

If you have any questions, please feel free to contact me at the phone number or email address below, or you may contact Tom Lehmkuhl, FHWA Environmental Engineer, at (605) 776-1012.

Sincerely,

Chad Babcock
Environmental Manager
605.773.3721

Attachment



HDR brookings SD DOT

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PROJECT LOCATION MAP

EM 0295(45) 130, PCN 020V, Brookings County

FIGURE 1

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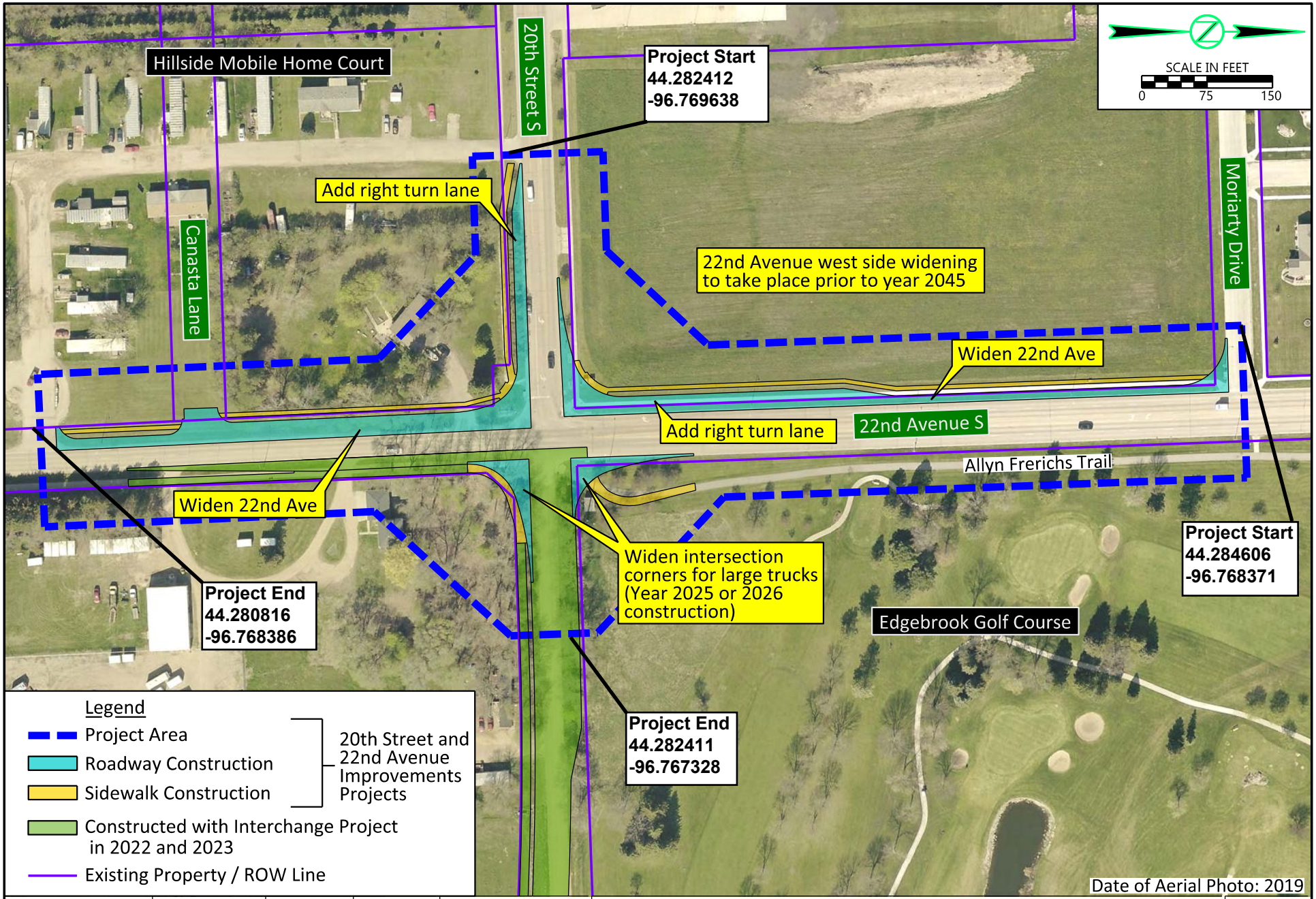

Drawn By: B.Miller
Date: 9/6/2024
Chked By: J.Unruh
Date: 9/6/2024
Revision:

Project Area for 20th Street / 22nd Avenue Intersection Expansion and Widening

I-29 Exit 130 (20th Street S) Interchange PCN 020V — Brookings, SD

Figure 2

SD DEPARTMENT OF TRANSPORTATION

Planning and Engineering
Environmental Office
700 E Broadway Avenue
Pierre, SD 57501-2586
O: 605.773.4336
dot.sd.gov

November 4, 2024

Garrie Kills-a-hundred, Tribal Historic Preservation Officer
Flandreau Santee Sioux Tribe
PO Box 283
Flandreau, SD 57028

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (EA)
Improvements at Intersection of 20th Street South and 22nd Avenue South

Dear Mr. Kills-a-hundred:

We have previously coordinated with your agency for the completion of the 2020 Environmental Assessment (EA) for this project. The original project was the construction of a new interchange at Exit 130 within the City of Brookings and expansion of one mile of existing 20th Street South from a dead-end gravel road to a three-lane urban roadway with an adjacent shared use path. The project was construction in 2022 and 2023 and opened to traffic on July 29, 2023. Attached Figure 1 provides the area of the overall interchange project.

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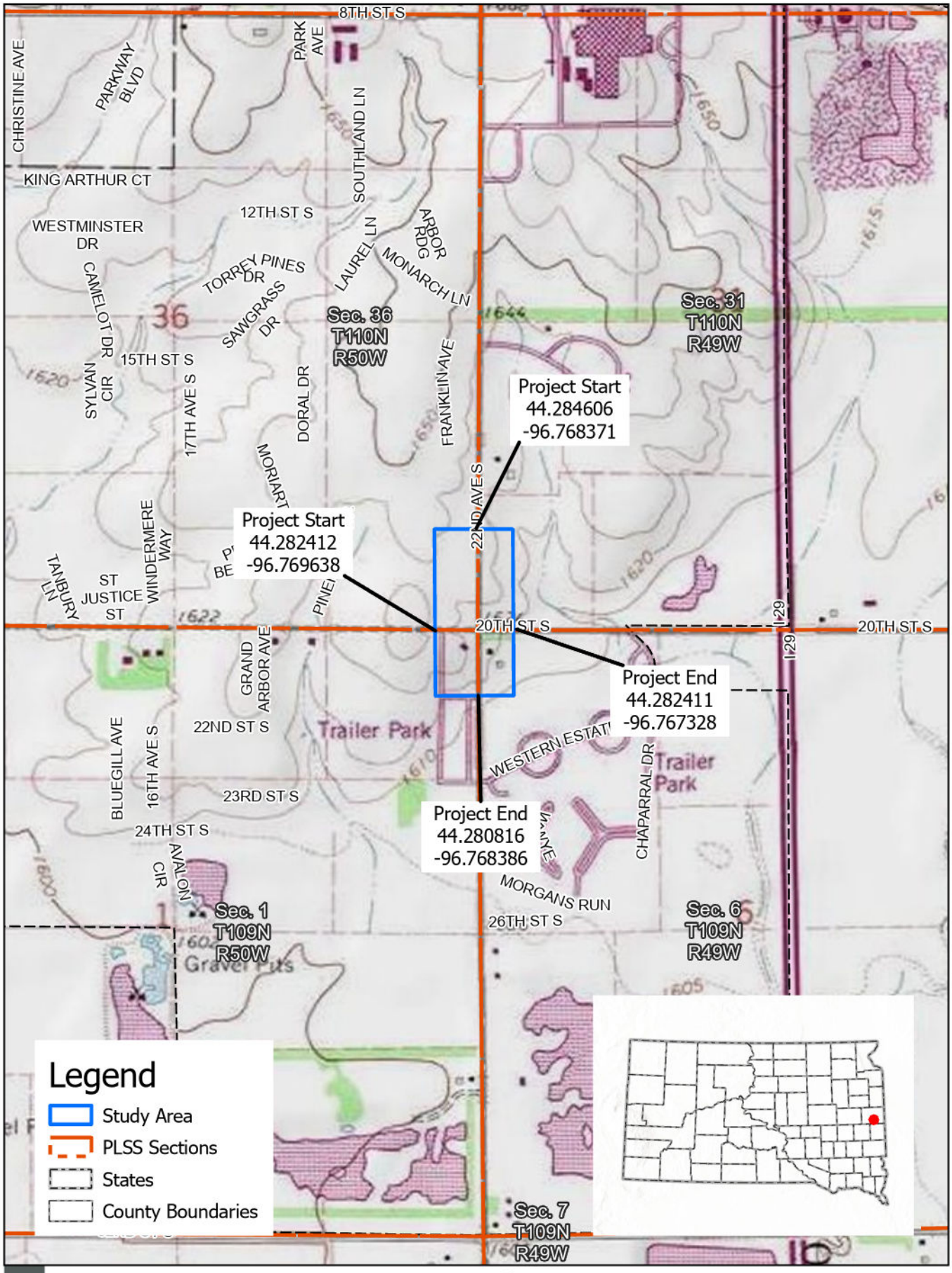
Pursuant to Section 106 of the National Historic Preservation Act (36 CFR Part 800), the South Dakota Department of Transportation, on behalf of the Federal Highway Administration – SD Division, is soliciting comments on this project from tribes that have expressed an interest in highway projects in Brookings County. Please provide your comments by November 30, 2024, so that the project can move toward a timely letting and construction.

If you have any questions, please feel free to contact me at the phone number or email address below, or you may contact Tom Lehmkuhl, FHWA Environmental Engineer, at (605) 776-1012.

Sincerely,

Chad Babcock
Environmental Manager
605.773.3721

Attachment



HDR brookings SD DOT

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PROJECT LOCATION MAP

EM 0295(45) 130, PCN 020V, Brookings County

FIGURE 1

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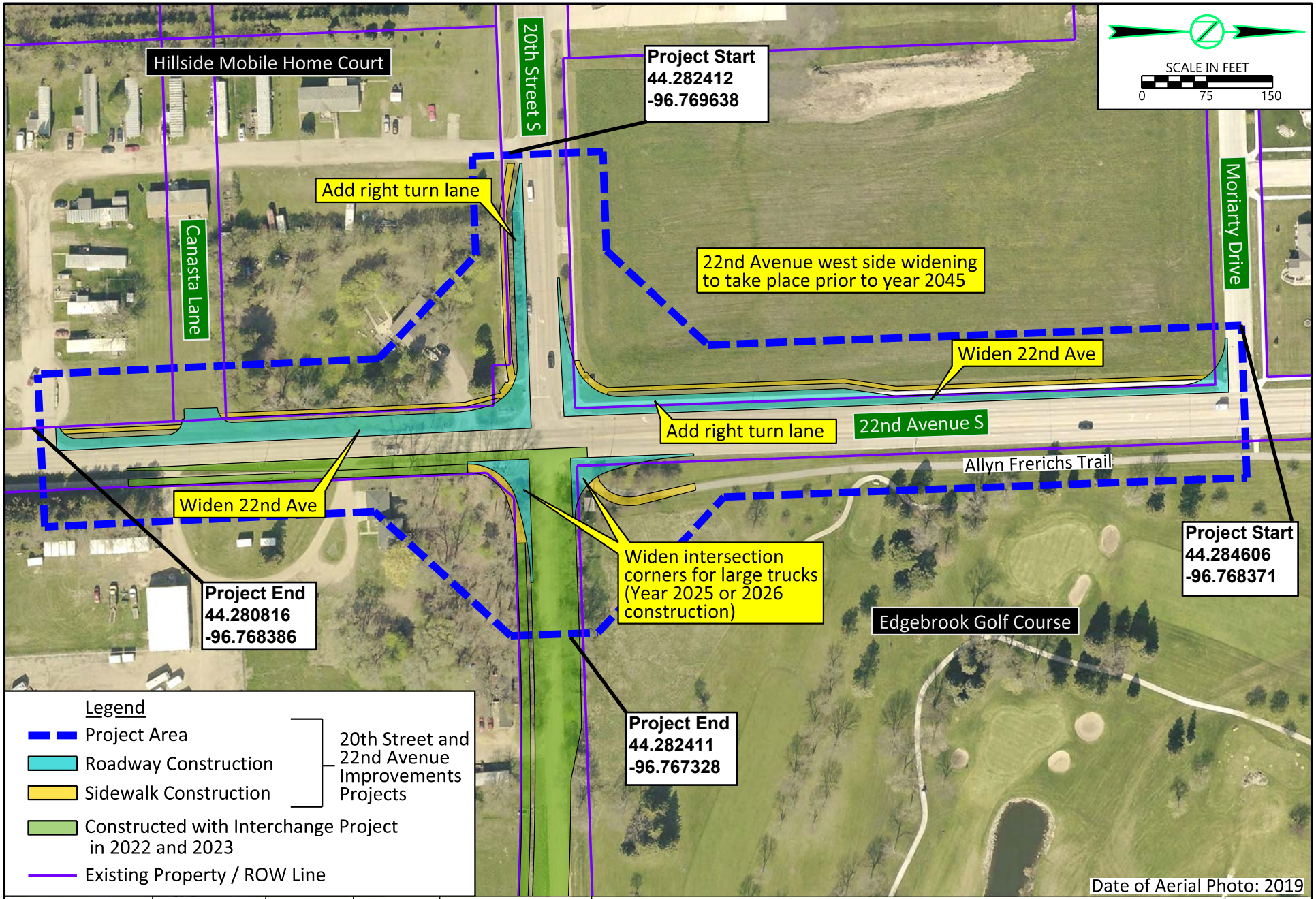

Drawn By: B.Miller
Date: 9/6/2024
Chked By: J.Unruh
Date: 9/6/2024
Revision:

Project Area for 20th Street / 22nd Avenue Intersection Expansion and Widening

I-29 Exit 130 (20th Street S) Interchange PCN 020V — Brookings, SD

Figure 2

DEPARTMENT OF TRANSPORTATION

Planning and Engineering
Environmental Office
700 E Broadway Avenue
Pierre, SD 57501-2586
O: 605.773.4336
dot.sd.gov

November 4, 2024

Brian Molyneaux, Tribal Archaeologist
Lower Brule Sioux Tribe
PO Box 187
Lower Brule, SD 57548

CC: Mary Jane Gourneau
Lower Brule Sioux Tribe
PO Box 187
Lower Brule, SD 57548

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (EA)
Improvements at Intersection of 20th Street South and 22nd Avenue South

Dear Mr. Molyneaux:

We have previously coordinated with your agency for the completion of the 2020 Environmental Assessment (EA) for this project. The original project was the construction of a new interchange at Exit 130 within the City of Brookings and expansion of one mile of existing 20th Street South from a dead-end gravel road to a three-lane urban roadway with an adjacent shared use path. The project was construction in 2022 and 2023 and opened to traffic on July 29, 2023. Attached Figure 1 provides the area of the overall interchange project.

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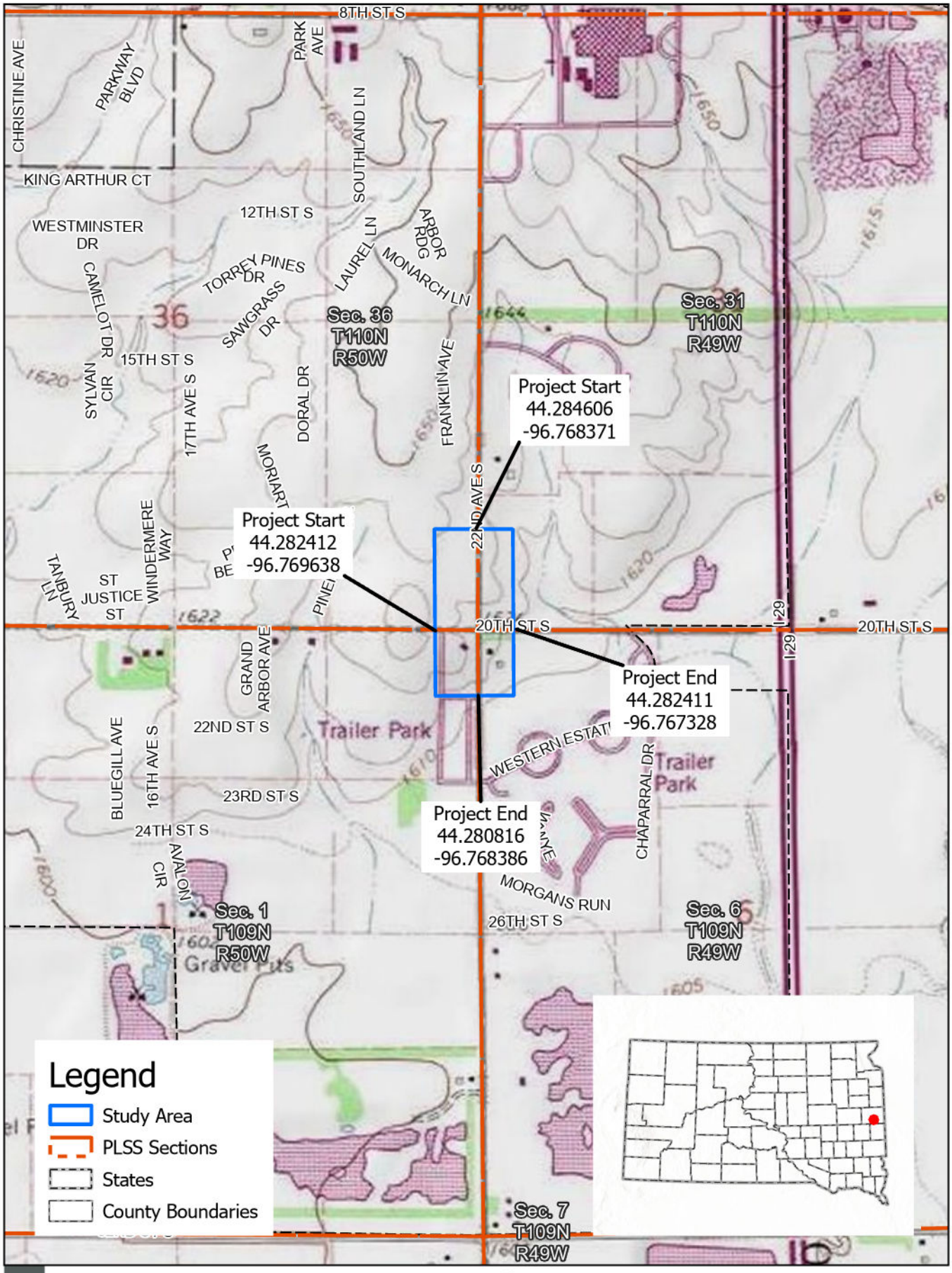
If you have any questions, please feel free to contact me at the phone number or email address below, or you may contact Tom Lehmkuhl, FHWA Environmental Engineer, at (605) 776-1012.

Sincerely,

Chad Babcock
Environmental Manager
605.773.3721

Attachment



HDR brookings SD DOT

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PROJECT LOCATION MAP

EM 0295(45) 130, PCN 020V, Brookings County

FIGURE 1

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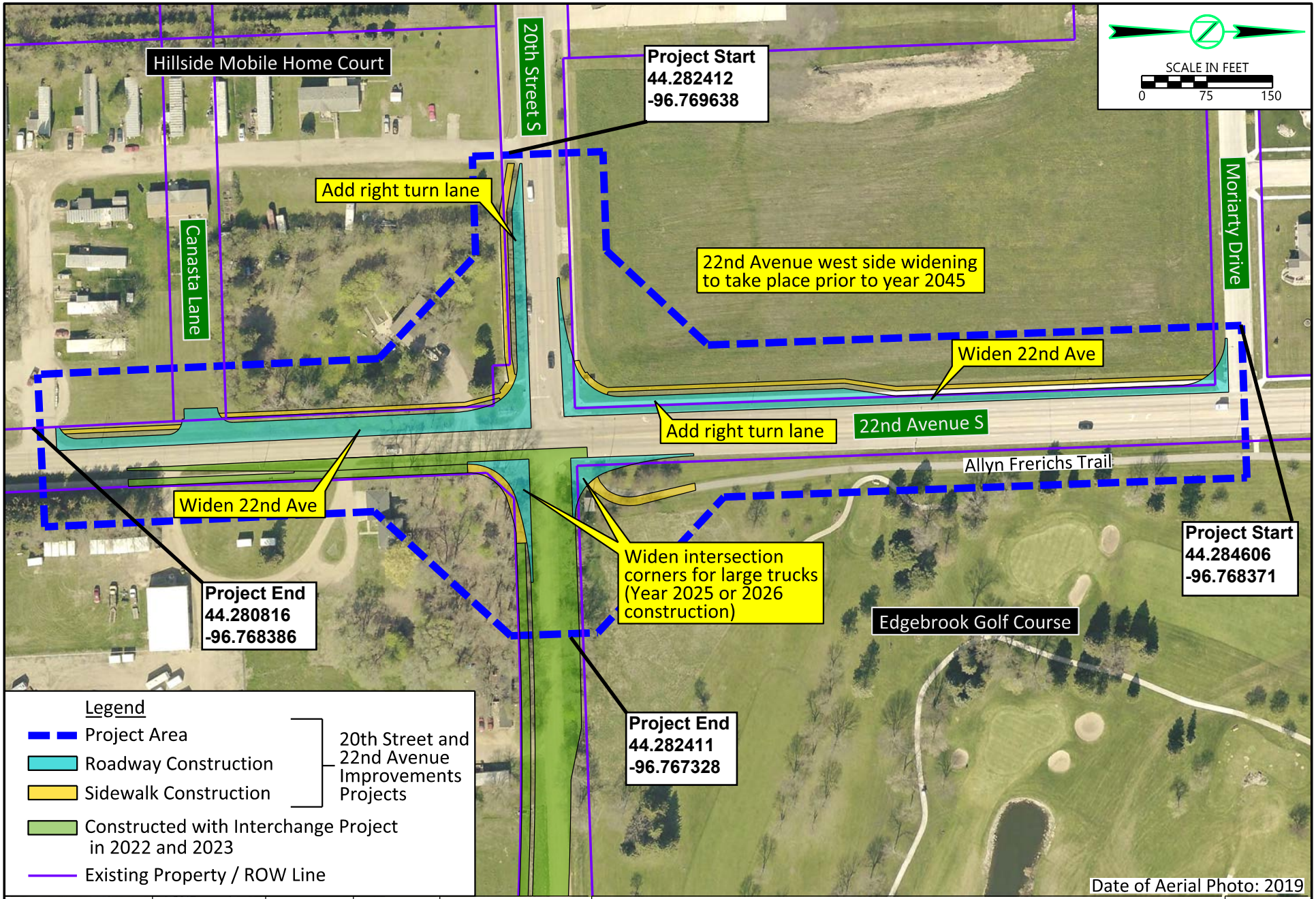

Drawn By: B.Miller
Date: 9/6/2024
Chked By: J.Unruh
Date: 9/6/2024
Revision:

Project Area for 20th Street / 22nd Avenue Intersection Expansion and Widening

I-29 Exit 130 (20th Street S) Interchange PCN 020V — Brookings, SD

Figure 2

SD DEPARTMENT OF TRANSPORTATION

Planning and Engineering
Environmental Office
700 E Broadway Avenue
Pierre, SD 57501-2586
O: 605.773.4336
dot.sd.gov

November 4, 2024

Ione Quigley, Tribal Historic Preservation Officer
Rosebud Sioux Tribe
PO Box 750
Rosebud, SD 57570-0658

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (EA)
Improvements at Intersection of 20th Street South and 22nd Avenue South

Dear Ms. Quigley:

We have previously coordinated with your agency for the completion of the 2020 Environmental Assessment (EA) for this project. The original project was the construction of a new interchange at Exit 130 within the City of Brookings and expansion of one mile of existing 20th Street South from a dead-end gravel road to a three-lane urban roadway with an adjacent shared use path. The project was construction in 2022 and 2023 and opened to traffic on July 29, 2023. Attached Figure 1 provides the area of the overall interchange project.

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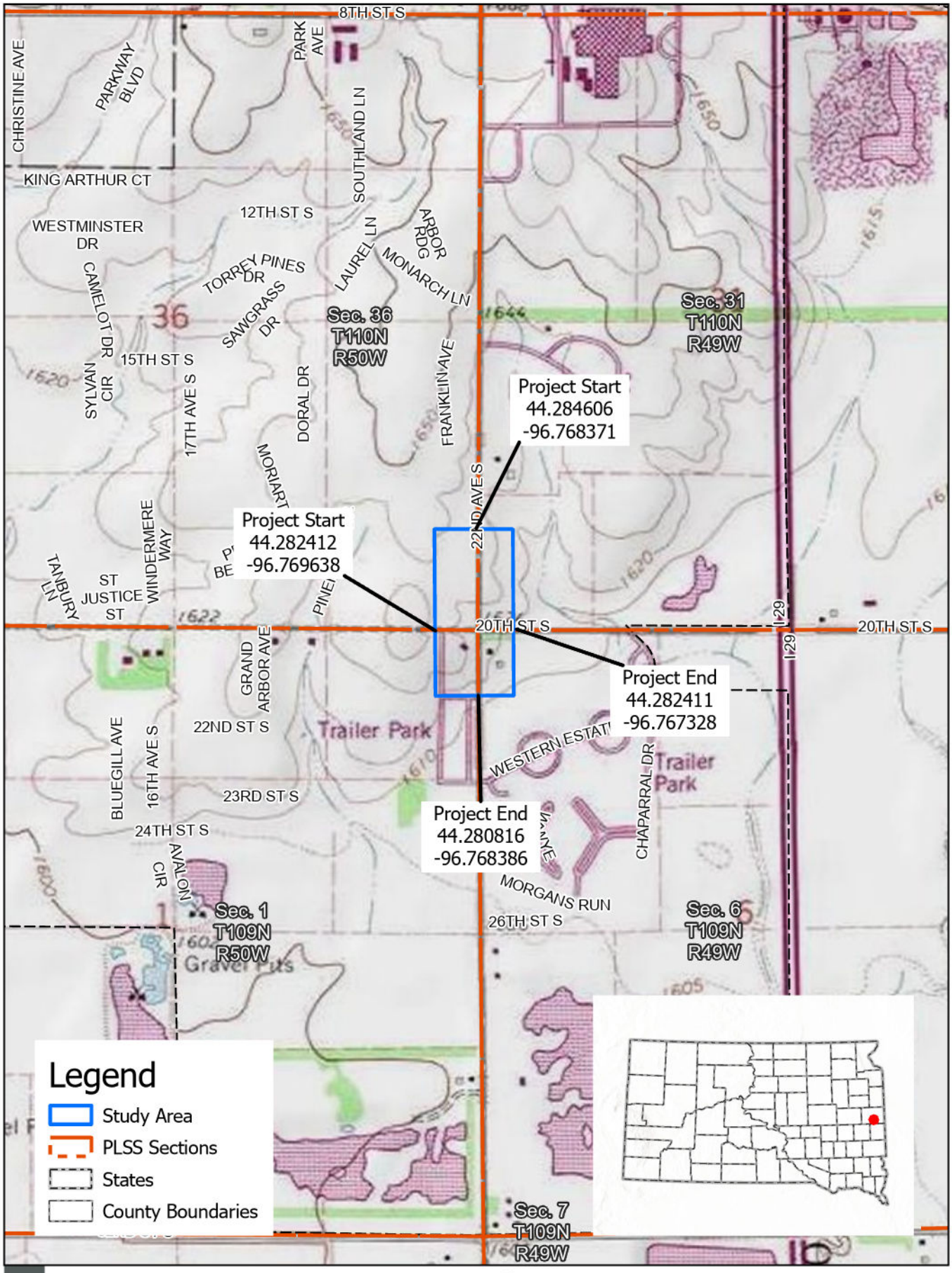
If you have any questions, please feel free to contact me at the phone number or email address below, or you may contact Tom Lehmkuhl, FHWA Environmental Engineer, at (605) 776-1012.

Sincerely,

Chad Babcock
Environmental Manager
605.773.3721

Attachment



HDR brookings SD DOT

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PROJECT LOCATION MAP

EM 0295(45) 130, PCN 020V, Brookings County

FIGURE 1

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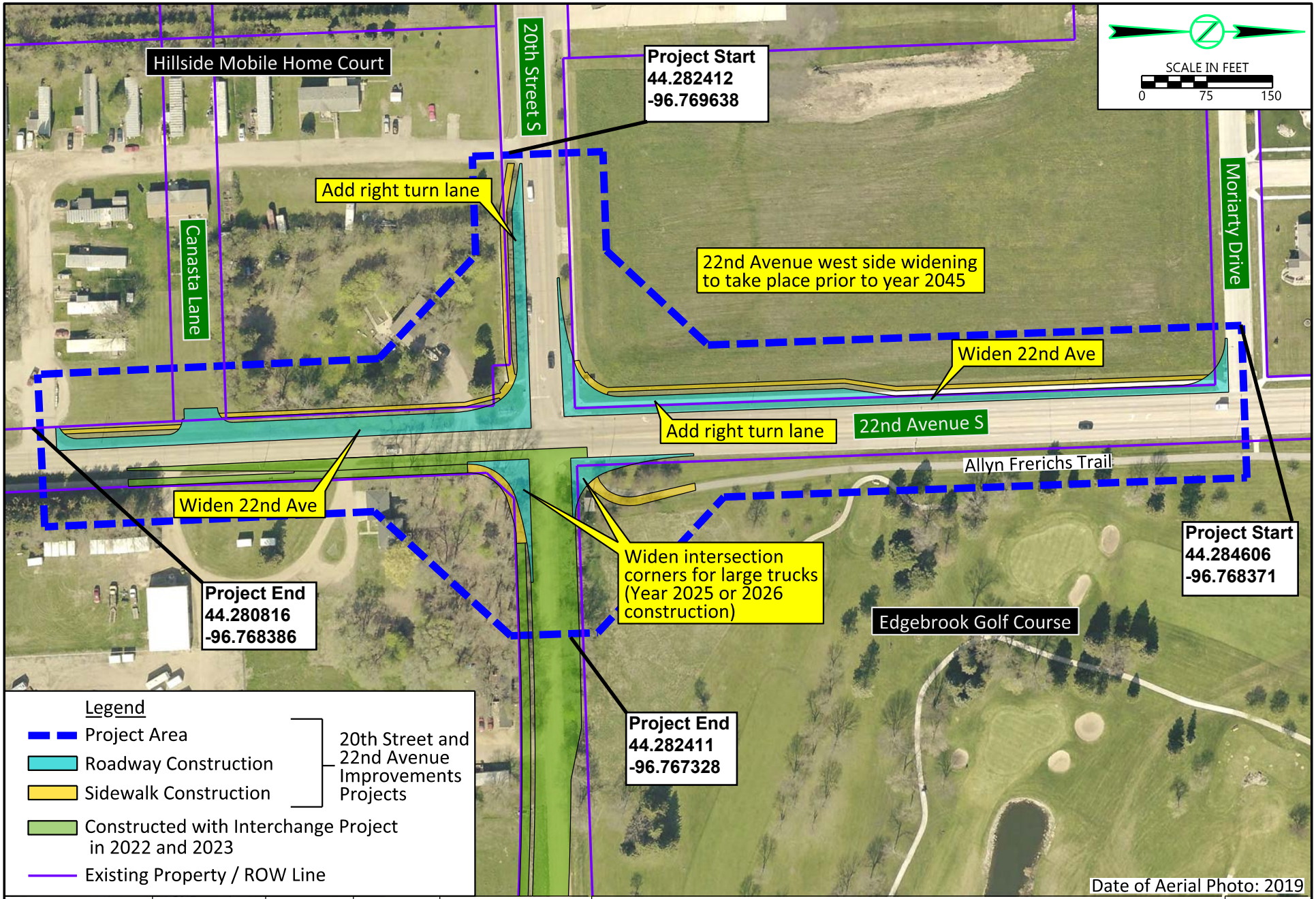


Drawn By: B.Miller
Date: 9/6/2024
Chked By: J.Unruh
Date: 9/6/2024
Revision:

Project Area for 20th Street / 22nd Avenue Intersection Expansion and Widening

I-29 Exit 130 (20th Street S) Interchange PCN 020V — Brookings, SD

Figure 2

DEPARTMENT OF TRANSPORTATION

Planning and Engineering
Environmental Office
700 E Broadway Avenue
Pierre, SD 57501-2586
O: 605.773.4336
dot.sd.gov

April 23, 2025

Jonathan Windy Boy
Chippewa Cree Tribe
PO Box 230
Box Elder, MT 59521

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (EA)
Improvements at Intersection of 20th Street South and 22nd Avenue South

Dear Mr. Windy Boy:

We have previously coordinated with your agency for the completion of the 2020 Environmental Assessment (EA) for this project. The original project was the construction of a new interchange at Exit 130 within the City of Brookings and expansion of one mile of existing 20th Street South from a dead-end gravel road to a three-lane urban roadway with an adjacent shared use path. The project was construction in 2022 and 2023 and opened to traffic on July 29, 2023. Attached Figure 1 provides the area of the overall interchange project.

Due to timeframe, existing utilities, and Section 6(f) property constraints, the east-side corners of the 20th Street South/22nd Avenue South intersection were constructed to a substandard design that limited large truck movements. As a follow-up to the interchange project, SDDOT and the City of Brookings proposed to expand the intersection corners to better accommodate large trucks. A funding source has been identified for this follow-up project and construction is anticipated for the summer of 2025. This will involve acquisition of permanent right-of-way (ROW) for roadway purposes and temporary construction easement on the southwest corner of Edgebrook Golf course. The expanded intersection would require reconstruction of a portion of the Allyn Frerichs Trail. Future widening (by year 2045) of 20th Street South and 22nd Avenue South are also part of this environmental analysis. Figure 2 illustrates the specific area for which we request your review and comments at this time.

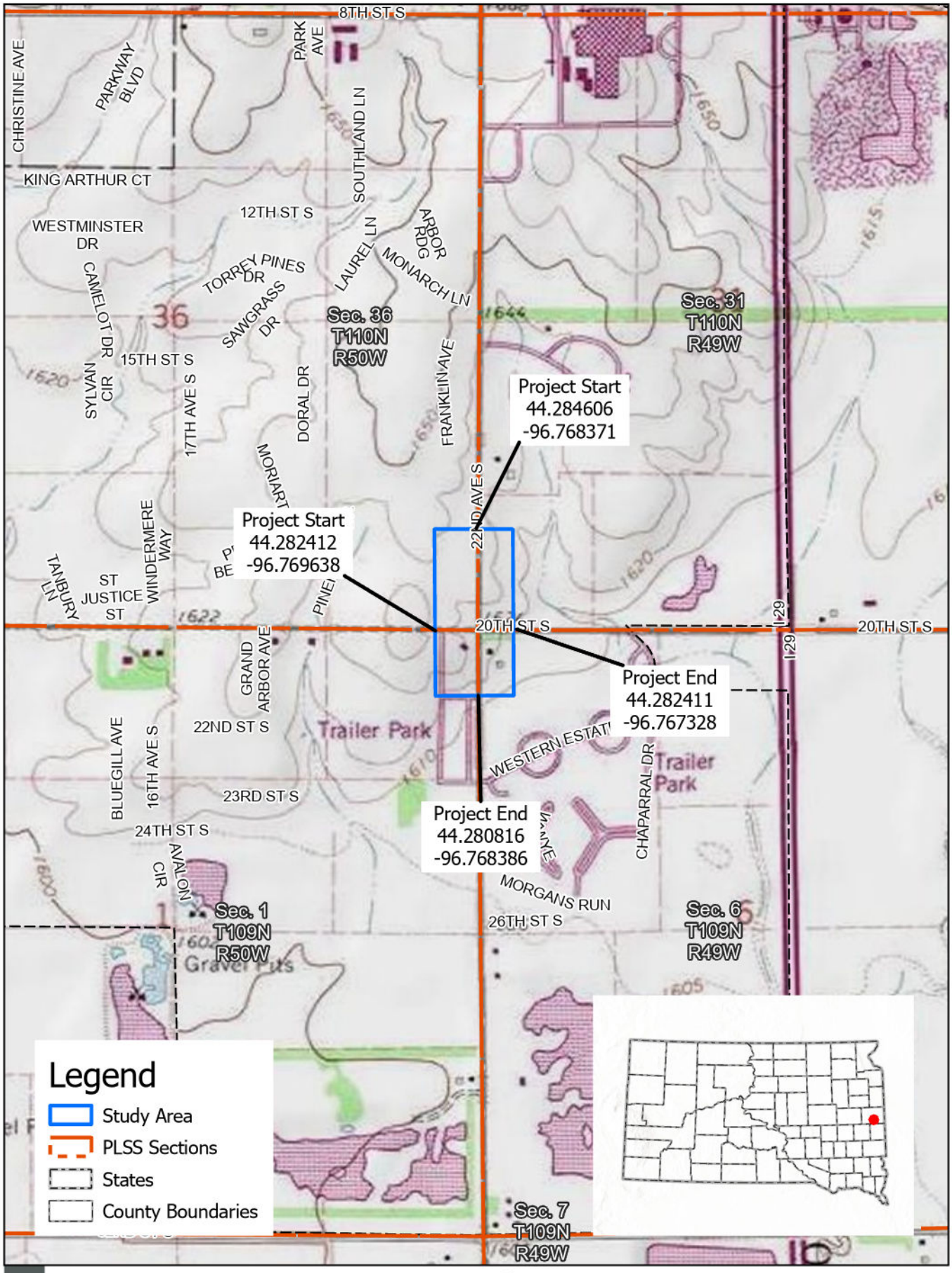
Pursuant to Section 106 of the National Historic Preservation Act (36 CFR Part 800), the South Dakota Department of Transportation, on behalf of the Federal Highway Administration – SD Division, is soliciting comments on this project from tribes that have expressed an interest in highway projects in Brookings County. Please provide your comments by May 23, 2025,so that the project can move toward a timely letting and construction.

If you have any questions, please feel free to contact me at the phone number or email address below, or you may contact Tom Lehmkuhl, FHWA Environmental Engineer, at (605) 776-1012.

Sincerely,

Chad Babcock
Environmental Manager
605.773.3721

Attachment



HDR brookings SD DOT

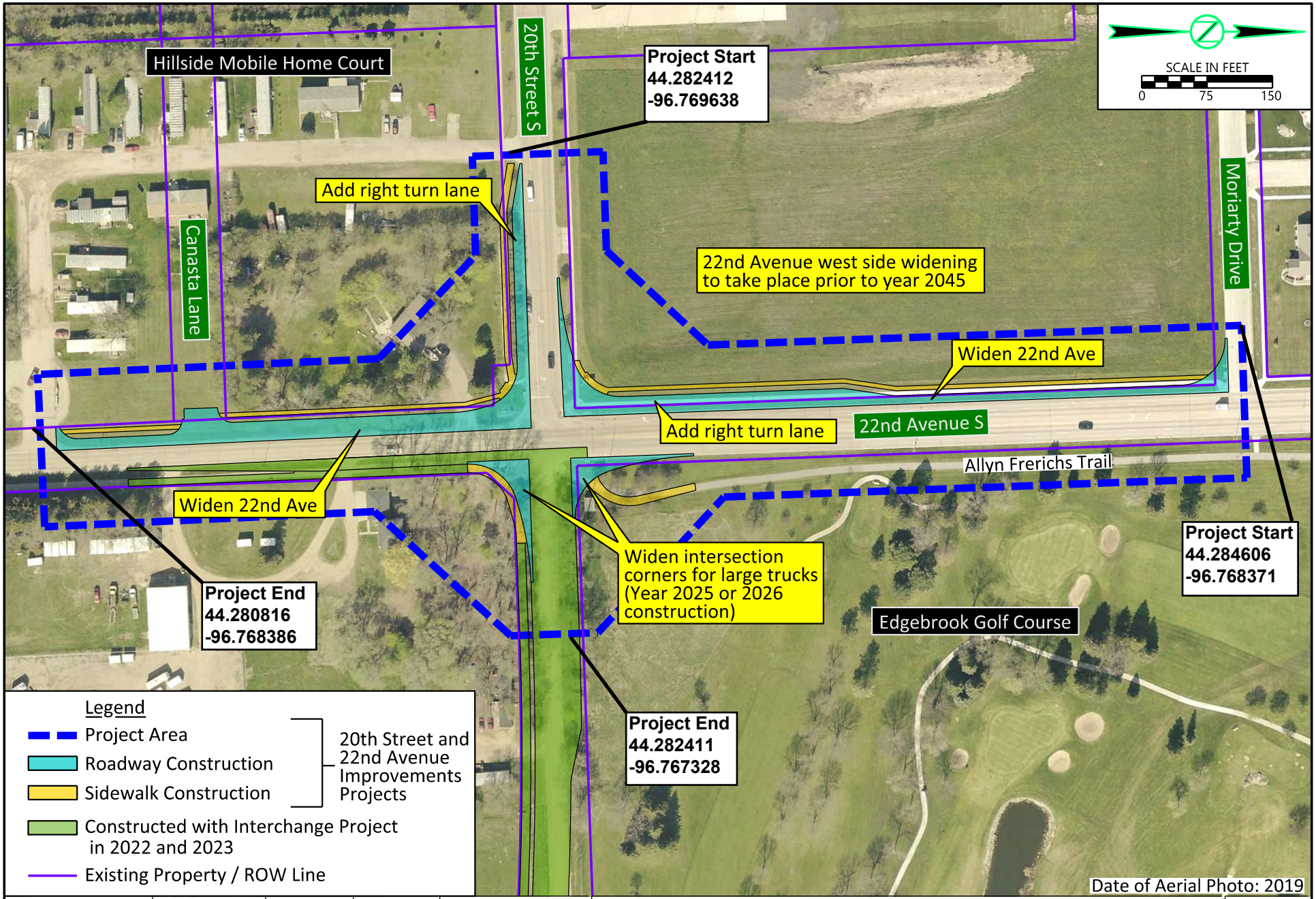
0 800 US Feet

PROJECT LOCATION MAP

EM 0295(45) 130, PCN 020V, Brookings County

FIGURE 1

Y:\PROJECTS\CITY_OF_BROOKINGS\20THST_EXPANSION\7.2_WIP\APRX\BROOKINGS_20THSTEXPANSION.APRX DATE: 9/4/2024



Drawn By: B.Miller
Date: 9/6/2024
Chked By: J.Unruh
Date: 9/6/2024
Revision:

Project Area for 20th Street / 22nd Avenue Intersection Expansion and Widening

I-29 Exit 130 (20th Street S) Interchange PCN 020V — Brookings, SD

Figure 2

DEPARTMENT OF TRANSPORTATION

Planning and Engineering
Environmental Office
700 E Broadway Avenue
Pierre, SD 57501-2586
O: 605.773.4336
dot.sd.gov

April 23, 2025

Dianne Desrosiers, THPO
Sisseton Wahpeton Oyate
PO Box 907
Sisseton, SD 57262

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (EA)
Improvements at Intersection of 20th Street South and 22nd Avenue South

Dear Ms. Desrosiers:

We have previously coordinated with your agency for the completion of the 2020 Environmental Assessment (EA) for this project. The original project was the construction of a new interchange at Exit 130 within the City of Brookings and expansion of one mile of existing 20th Street South from a dead-end gravel road to a three-lane urban roadway with an adjacent shared use path. The project was construction in 2022 and 2023 and opened to traffic on July 29, 2023. Attached Figure 1 provides the area of the overall interchange project.

Due to timeframe, existing utilities, and Section 6(f) property constraints, the east-side corners of the 20th Street South/22nd Avenue South intersection were constructed to a substandard design that limited large truck movements. As a follow-up to the interchange project, SDDOT and the City of Brookings proposed to expand the intersection corners to better accommodate large trucks. A funding source has been identified for this follow-up project and construction is anticipated for the summer of 2025. This will involve acquisition of permanent right-of-way (ROW) for roadway purposes and temporary construction easement on the southwest corner of Edgebrook Golf course. The expanded intersection would require reconstruction of a portion of the Allyn Frerichs Trail. Future widening (by year 2045) of 20th Street South and 22nd Avenue South are also part of this environmental analysis. Figure 2 illustrates the specific area for which we request your review and comments at this time.

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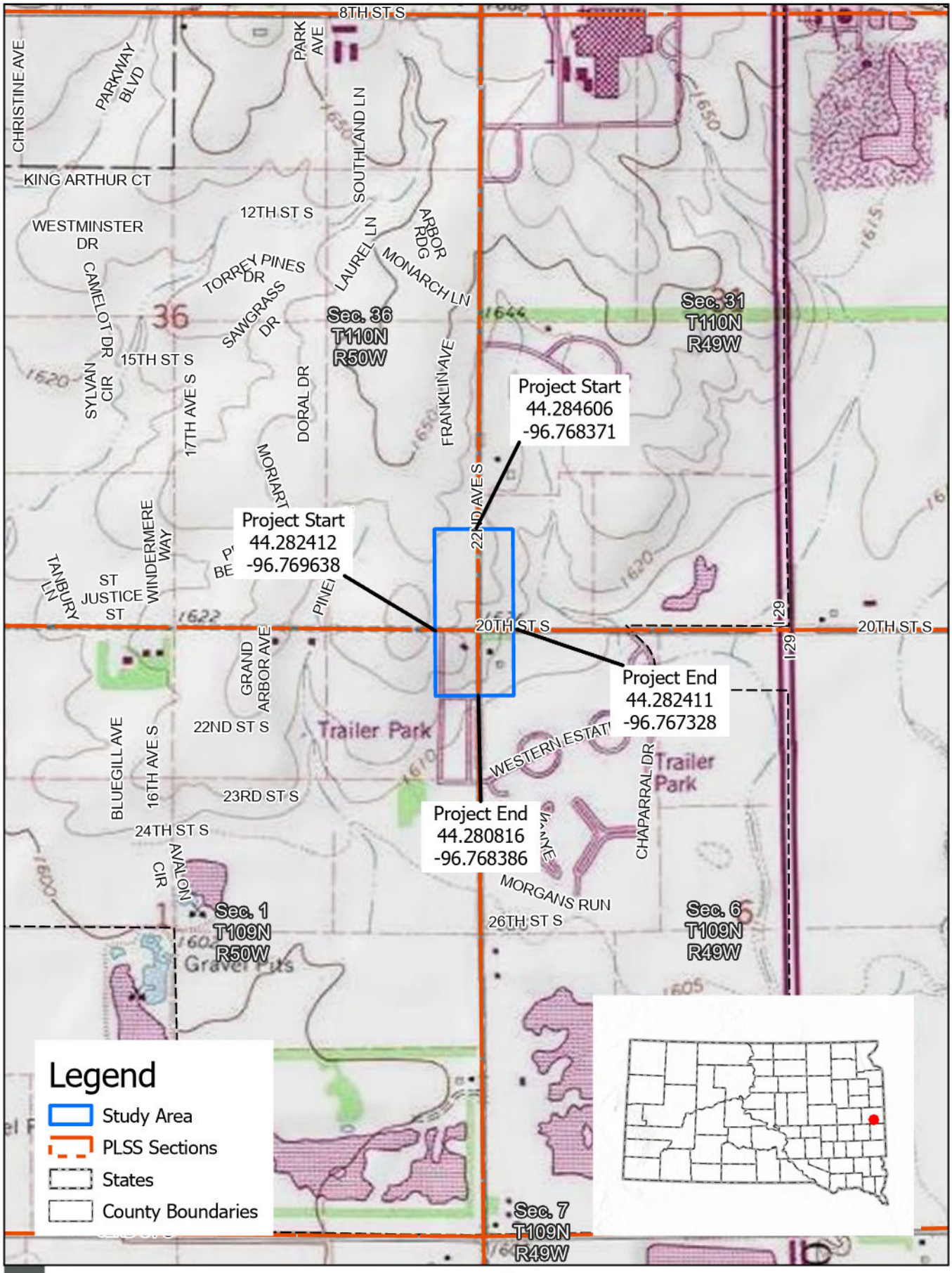
If you have any questions, please feel free to contact me at the phone number or email address below, or you may contact Tom Lehmkuhl, FHWA Environmental Engineer, at (605) 776-1012.

Sincerely,

Chad Babcock
Environmental Manager
605.773.3721

Attachment



HDR brookings SD DOT

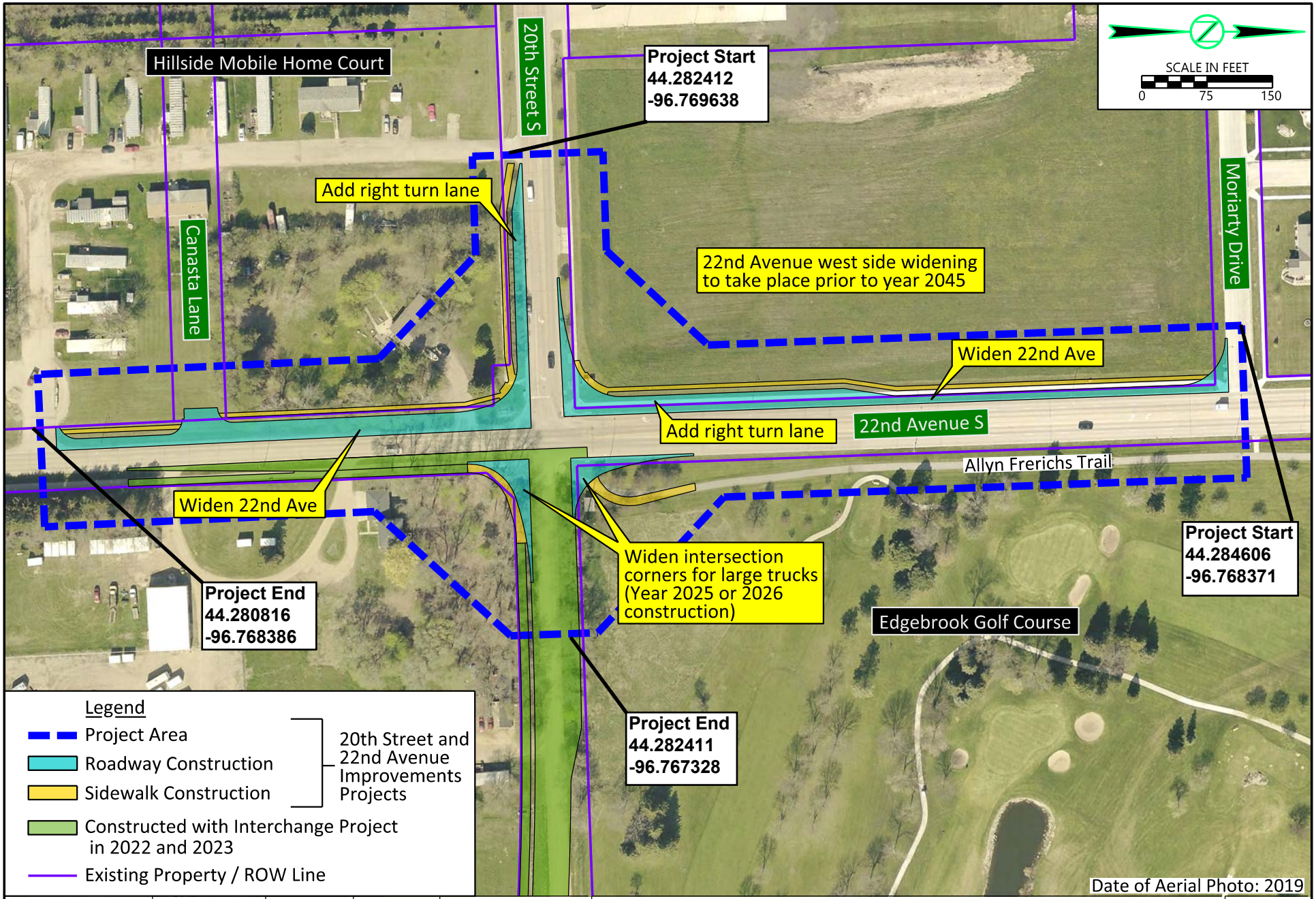
0 800 US Feet

PROJECT LOCATION MAP

EM 0295(45) 130, PCN 020V, Brookings County

FIGURE 1

Y:\PROJECTS\CITY_OF_BROOKINGS\20THST_EXPANSION\7.2_WIP\APRX\BROOKINGS_20THSTEXPANSION.APRX DATE: 9/4/2024



Drawn By: B.Miller
Date: 9/6/2024
Chked By: J.Unruh
Date: 9/6/2024
Revision:

Project Area for 20th Street / 22nd Avenue Intersection Expansion and Widening

I-29 Exit 130 (20th Street S) Interchange PCN 020V — Brookings, SD

Figure 2

DEPARTMENT OF TRANSPORTATION

Planning and Engineering
Environmental Office
700 E Broadway Avenue
Pierre, SD 57501-2586
O: 605.773.4336
dot.sd.gov

April 23, 2025

Allan Demaray, THPO Director
Three Affiliated Tribes (Mandan Hidatsa Arikara Nation)
307 5th Avenue
New Town, ND 58763

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange Supplemental Environmental Assessment (EA)
Improvements at Intersection of 20th Street South and 22nd Avenue South

Dear Mr. Demaray:

We have previously coordinated with your agency for the completion of the 2020 Environmental Assessment (EA) for this project. The original project was the construction of a new interchange at Exit 130 within the City of Brookings and expansion of one mile of existing 20th Street South from a dead-end gravel road to a three-lane urban roadway with an adjacent shared use path. The project was construction in 2022 and 2023 and opened to traffic on July 29, 2023. Attached Figure 1 provides the area of the overall interchange project.

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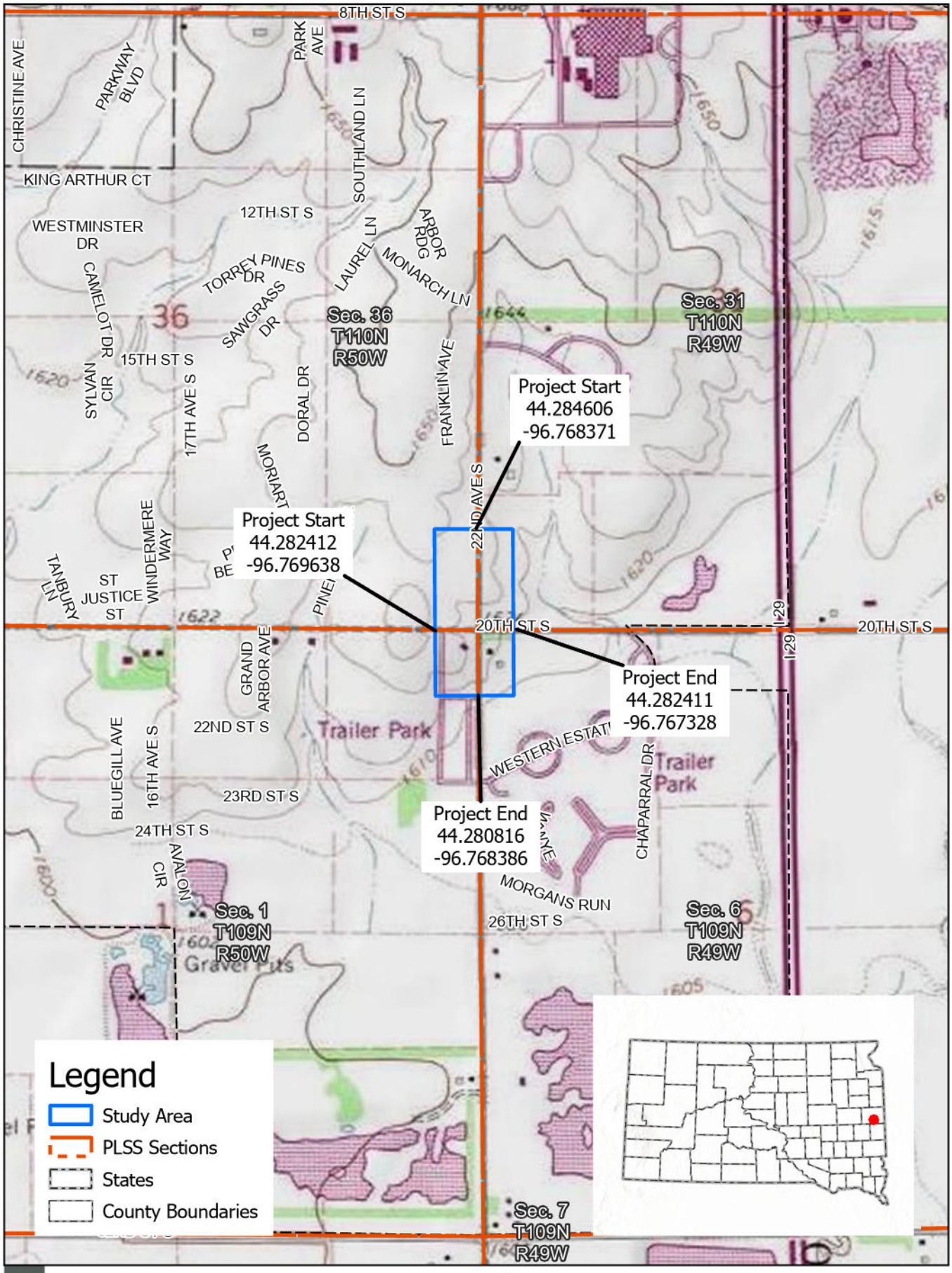
If you have any questions, please feel free to contact me at the phone number or email address below, or you may contact Tom Lehmkuhl, FHWA Environmental Engineer, at (605) 776-1012.

Sincerely,

Chad Babcock
Environmental Manager
605.773.3721

Attachment



HDR brookings SD DOT

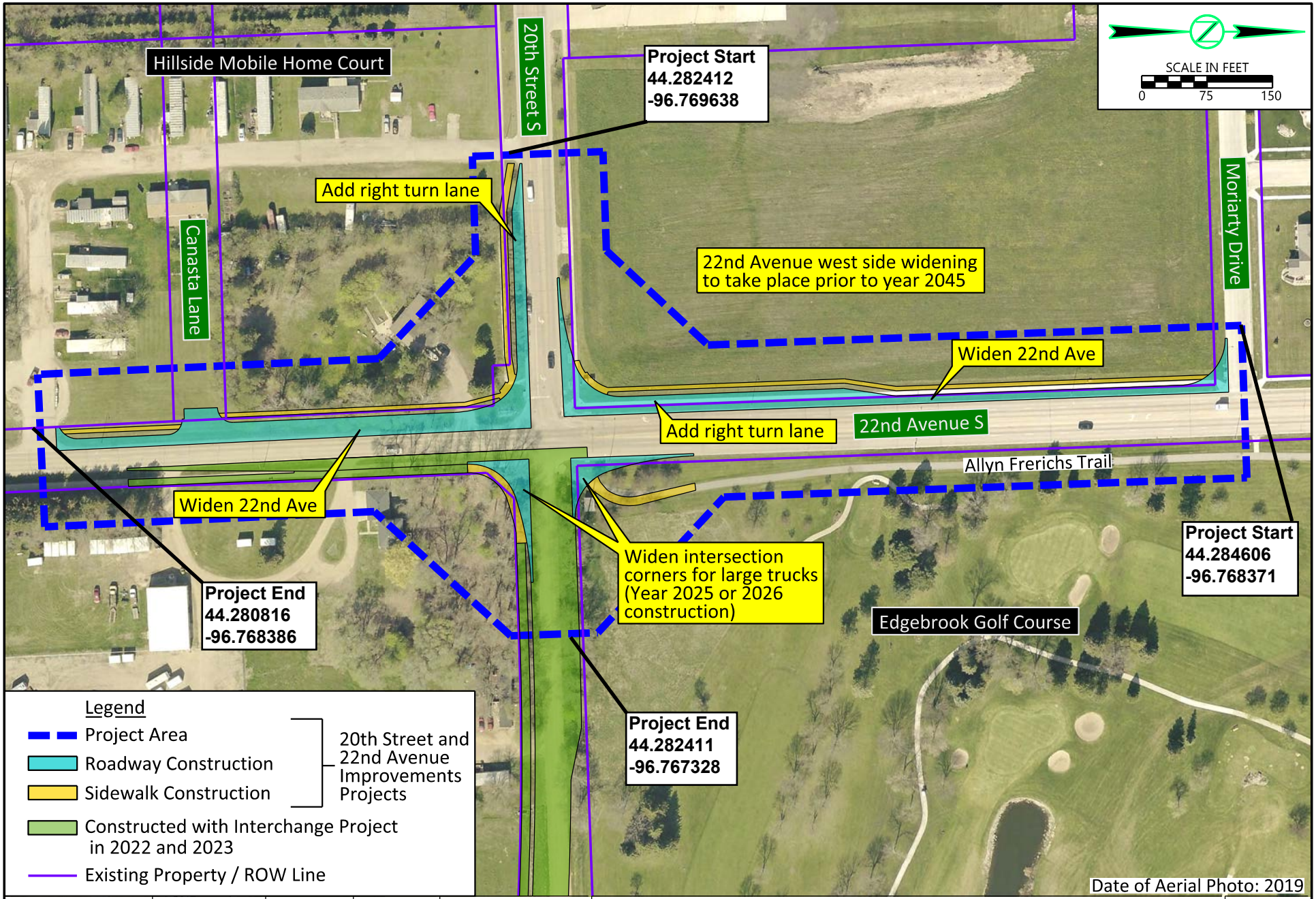
0 800 US Feet

PROJECT LOCATION MAP

EM 0295(45) 130, PCN 020V, Brookings County

FIGURE 1

Y:\PROJECTS\CITY_OF_BROOKINGS\20THST_EXPANSION\7.2_WIP\APRX\BROOKINGS_20THSTEXPANSION.APRX DATE: 9/4/2024



Drawn By: B.Miller
Date: 9/6/2024
Chked By: J.Unruh
Date: 9/6/2024
Revision:

Project Area for 20th Street / 22nd Avenue Intersection Expansion and Widening

I-29 Exit 130 (20th Street S) Interchange PCN 020V — Brookings, SD

Figure 2

SDGFP Section 6(f)
Coordination

Technical Memo

Date: June 28, 2024

Project: I-29 Exit 130 (20th Street South) Interchange (PCN 020V)

To: Randy Kittle South Dakota Game, Fish, and Parks (SDGFP)

From: HDR

Subject: **Proposed Section 6(f) – (Edgebrook Golf Course) Impact Mitigation**

1. Purpose

The purpose of this memo is to document a proposed mitigation plan for permanent impacts to and associated conversion of Section 6(f) property. Specifically, we propose to impact 8,400 square feet of Edgebrook Golf Course property at the 20th Street/22nd Avenue intersection (southwest corner of the golf course) and replace it with 23,629 square feet along the south edge of the golf course.

2. Golf Course Impact Avoidance

As part of the I-29/20th Street interchange project, permanent impact and associated conversion of Section 6(f) property was avoided by:

- Realignment of 20th Street to the south and onto private property along Edgebrook Golf Course.
- Implementation of a sub-standard intersection corner design at the 20th Street/22nd Avenue intersection.

3. 20th Street/22nd Avenue Intersection Design

The decision about the sub-standard intersection corner design was made at the August 19, 2020, Preliminary Design Inspection (PDI) meeting. The screen clips below are from the PDI meeting summary letter.

Meeting attendees were:

Attendees:	Matt Brey, Joel Gengler, Brook White, Scott Rabern, Brad Richards, Kelly VanDeWiele, Mark Peterson (SDDOT); Kirk Van Roekel, Brett Hestdalen (FHWA); Jackie Lanning, Thad Drietz, Bret Henning (City of Brookings); Larry Jensen (Brookings County); Waylon Blasius, Rich Uckert (Banner); Brenda Miller, Ron Ceroll, Lee Kaffar, Troy Borchard, Lance McQueen, James Unruh (HDR)

This was the key meeting discussion related to the intersection design:

- 22nd Avenue Design
  - *With this project, we are unable to provide large enough corner radii for WB-67 trucks without impacting the golf course (Section 6f property) and thereby jeopardizing the grant funding timeframe.*
  - *Widening and realigning 22nd Avenue is not feasible with this project because it was not part of the grant award, and it has not been budgeted for the City of Brookings to pay for the improvement at this time.*
  - *The City will amend the 22nd Avenue corridor study to include the 20th Street intersection and then look at intersection improvements to alleviate the inadequate corners.*
  - *For the immediate timeframe, large trucks will have trouble making right turns at the 22nd Avenue/20th Street intersection.*

This screen clip from a PDI meeting graphic illustrated the intersection and truck turning constraints:

4. **Environmental Assessment (EA) and Finding of No Significant Impact (FONSI)**
   The EA was released for public comment on October 19, 2020. Included in the EA was the September 11, 2020, SDGFP concurrence with no adverse impact to Section 6(f) property (see **Attachment A).**

   The FONSI was signed by SDDOT and FHWA on January 22, 2021. This allowed the design and right-of-way acquisition to proceed. The "Project Ready" date was met which allowed the use of the BUILD Grant funds for the project construction. A condition of the grant was meeting the challenging timeframe.

5. **Construction**
   Bid letting was on November 17, 2021, and construction began in 2022 and was completed in 2023. All roadways were open to traffic by July 31, 2023. Golf course operations were not impacted during project construction.

   Attachment B and **Attachment C** Figure 39a provide photos of the completed project at the 20th Street/22nd Avenue intersection.

6. **Operational Complaints**
   Complaints from truck drivers (and others with trucks and trailers) began soon after the intersection was open to traffic because of the turning limitations and associated operation issues. The project team (City of Brookings, SDDOT, HDR) then took these steps:
   - An interim pavement marking plan was developed that reduced the number of lanes at the intersection but provided more room for turning (see **Attachment C**, Figure 39a left side). This plan is intended for implementation in 2024.

- The corridor study design for 22nd Avenue was extended to 20th Street and included an expansion of the intersection corners to accommodate trucks (See **Attachment C**, Figure 39b right side). Expansion of the 20th Street intersection corners on the east side of 22nd Avenue is tentatively planned for 2025 or 2026 construction. According to FHWA, remaining BUILD grant funding may be used for this construction if completed by June 30, 2025. Additional sources of funding may need to be secured.

7. **Section 6(f) (Edgebrook Golf Course) Impacts**
   Expansion of the 20th Street/22nd Avenue intersection will impact 8,400 square feet of the southwest corner of Edgebrook Golf Course. This area is needed to:
   - Expand the intersection pavement to facilitate truck turning movements,
   - Provide space for traffic and pedestrian signals,
   - Rebuild the trail to meet ADA slope requirements,
   - Provide a sight triangle for vehicles,
   - Allow space for relocation of the ITC building.

   The 8,400 square feet will become roadway right-of-way.

8. **Mitigation Proposal**
   During the ROW acquisition process, it was discovered that the golf cart path between the 11th hole green and the 12th hole tee had been built on the adjacent private property.

   To build the interchange, SDDOT acquired approximately 10 acres from the property owner on the south side of 20th Street. The acquisition documentation was split into two tracts and two separate plats. One of the tracts was 20 feet wide and approximately 1,181 feet long and includes the cart path. The intent is to utilize this 23,629 square foot parcel as mitigation for the impacted area in the southwest corner of the golf course. See **Attachment D** for the right of way plan and plats. As part of the Section 6(f) mitigation process, the plat will be deeded to Edgebrook Golf Course/City of Brookings Parks, Recreation & Forestry Department.

9. **Follow-up**
   - HDR intends on preparing an Environmental Assessment Supplement for the proposed improvement actions.
   - Randy will initiate discussions on this issue with the National Park Service.
   - Randy will verify that yellow-book appraisals and review appraisals will be required by National Park Service for this proposed conversion and mitigation process. HDR does have an appraisal firm available to conduct the appraisals; HDR staff will conduct the review appraisals.
   - Randy will provide HDR with direction on necessary documentation.
   - HDR to meet with City parks staff on this proposed work.

Department of Transportation
Environmental Office
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
605/773-4336

September 10, 2020

Randy Kittle
South Dakota Game, Fish, and Parks
Joe Foss Building, 523 East Capitol Avenue
Pierre, SD 57501

RE: **Section 6(f) Impact Considerations**
Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Mr. Kittle:

The City of Brookings, South Dakota Department of Transportation (SDDOT), and Federal Highway Administration (FHWA) have continued development of this project and identified the preferred alternative for a new interchange on Interstate 29 (I-29) at 20th Street South within Brookings, SD. Attached is a map showing the location of the above project (Figure 1).

Edgebrook Golf Course is a regulation public 18-hole facility with a nine-hole junior/short course located at 1415 22nd Avenue South. It is owned and operated by the City of Brookings. Fees are reviewed and set annually by Brookings Parks & Recreation Advisory Board and include single rounds of golf and seasonal passes. The clubhouse offers golf carts and equipment for rent as well as pro shop. Edgebrook also provides professional golf lessons by appointment. Three Land and Water Conservation Fund (LWCF) grants (46-00166, 46-00304, and 46-01035) were obtained to develop the Edgebrook golf course. Therefore, the entire golf course is protected under Section 6(f) for public outdoor recreation.

No permanent right-of-way is needed for the 20th Street construction and no operations of the golf course would be impacted. A temporary easement would be needed to complete the work along the south edge of the golf course near 20th Street. A total of 0.12 acres within the golf course property will be temporarily impacted and 0.28 acres of temporary easement would be required for construction (See Figure 2). The area will be re-graded and reseeded to a similar or better condition once construction of the area is complete.

Minimal grading would be needed along the south edge of the golf course for 20th Street construction as shown in attached Figure 1. The alignment of proposed 20th Street has been shifted to the south specifically to avoid impacts to the golf course. Near 22nd Avenue, the 20th Street fill slope would extend onto the City-owned golf course property as shown in the Section A-A view of Figure 1. This allows 20th Street to line up across 22nd Avenue. Construction within this area will take less than 6 months and no operations of the golf course will be impacted.

I am requesting your concurrence that the work being conducted will be considered a temporary non-conforming use 6(f) impact. If you concur, please indicate as such by providing your signature in the space provided below at your earliest convenience so the project's environmental documentation can be completed. Thank you for your time and cooperation on this matter. If you have questions and/or concerns, please feel free to contact me.

Sincerely,

Joanne M. Hight

Joanne Hight
Environmental Engineer Manager
605.773.3721

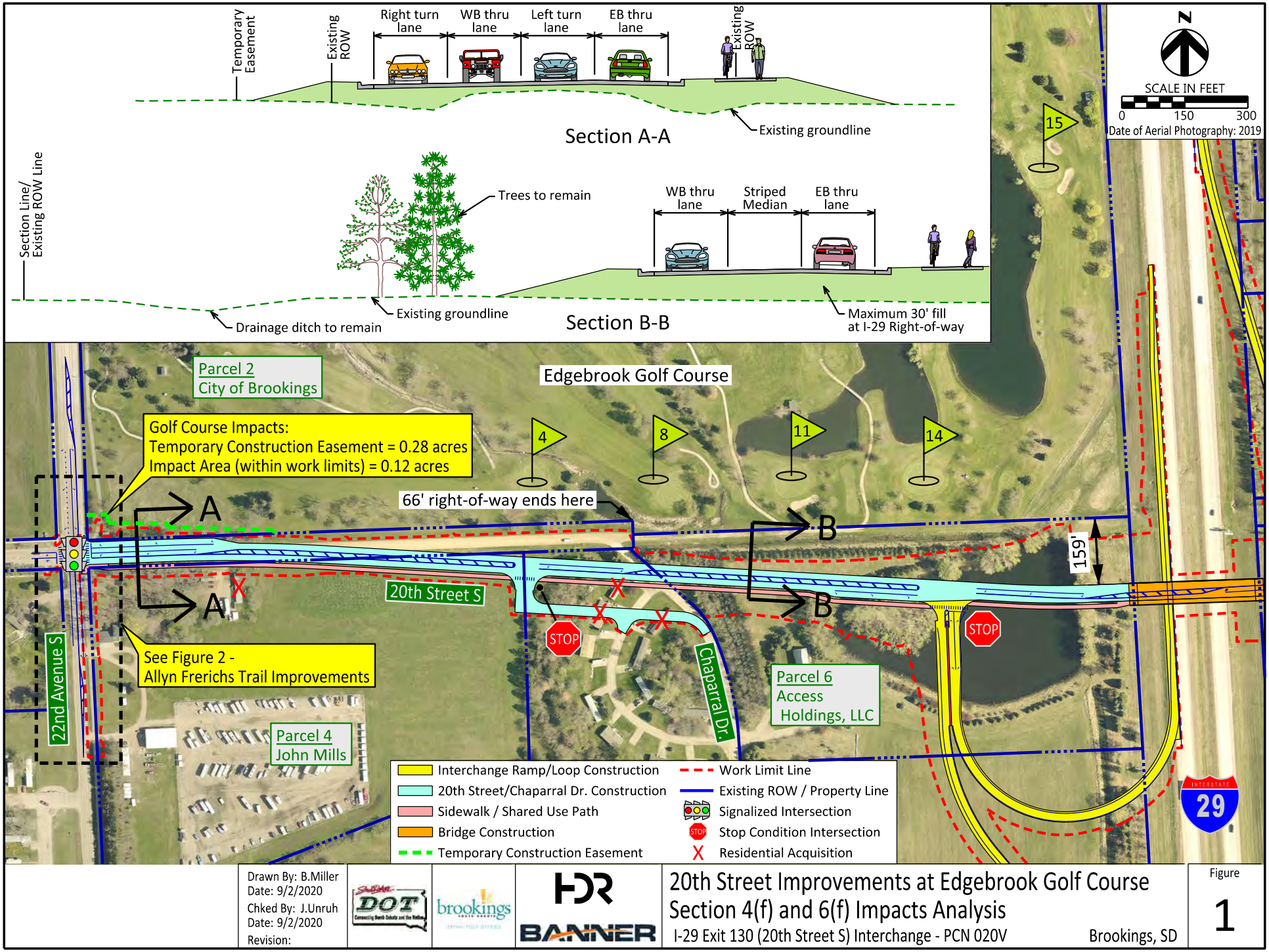
Attachment

Concurrence: As the designated alternate State Liason Officer who administers LWCF Program funds, I hereby concur that the use and impacts of the I-29 Exit 130 (20th Street South) Interchange project combined with identified avoidance, minimization, and mitigation measures, will not adversely affect the activities, features, and attributes that qualify Edgebrook Golf Course for protection under Section 6(f) and that the activities fall under a temporary, non-conforming use..

Randy Kittle 9/11/2020

Randy Kittle Date:

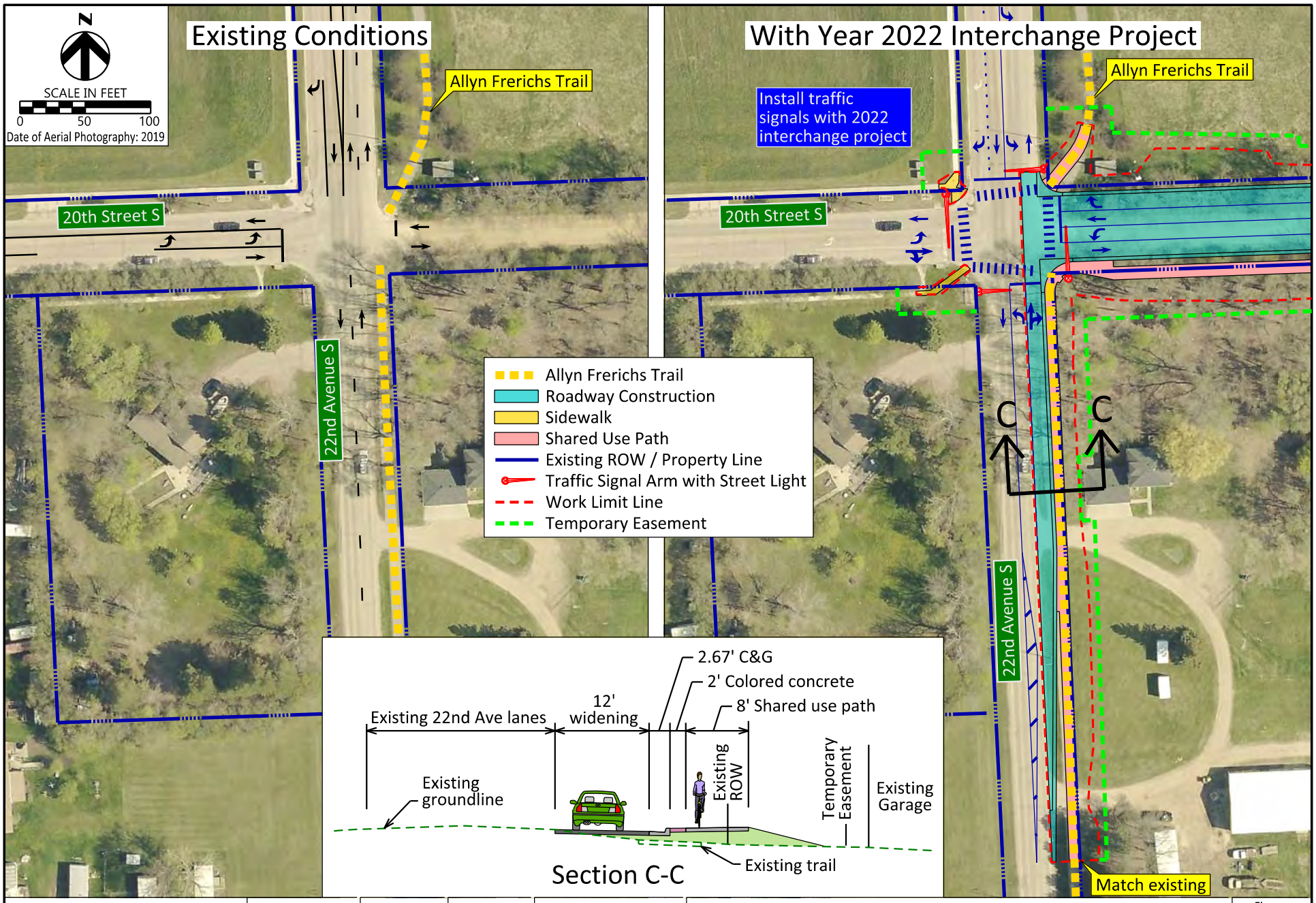
South Dakota Game, Fish, and Parks



Drawn By: B.Miller
Date: 9/2/2020
Chked By: J.Unruh
Date: 9/2/2020
Revision:

20th Street Improvements at Edgebrook Golf Course
Section 4(f) and 6(f) Impacts Analysis
I-29 Exit 130 (20th Street S) Interchange - PCN 020V
Brookings, SD

Figure
1

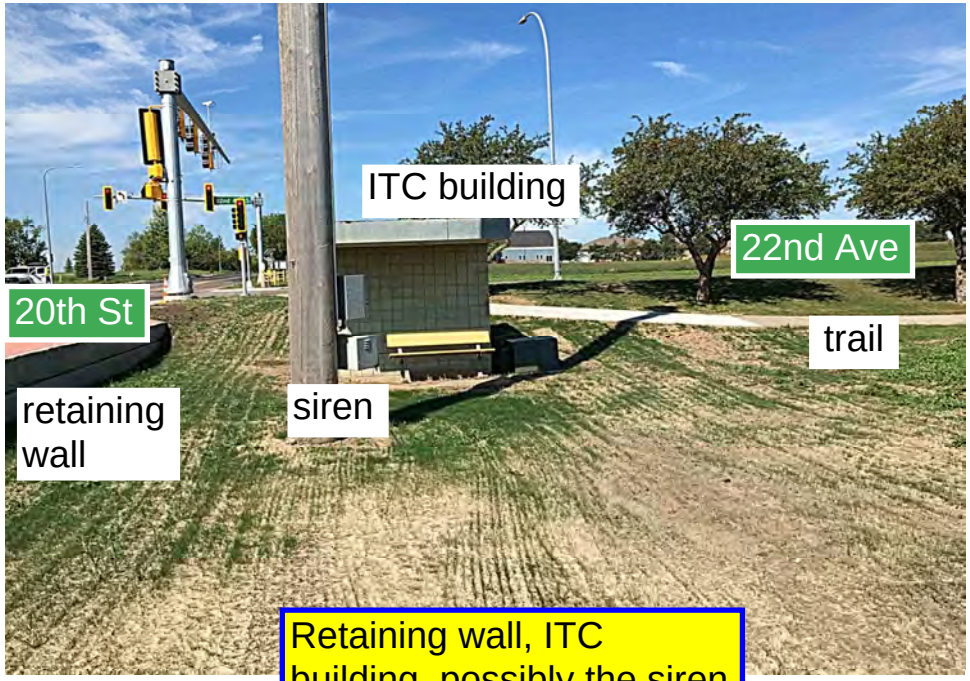


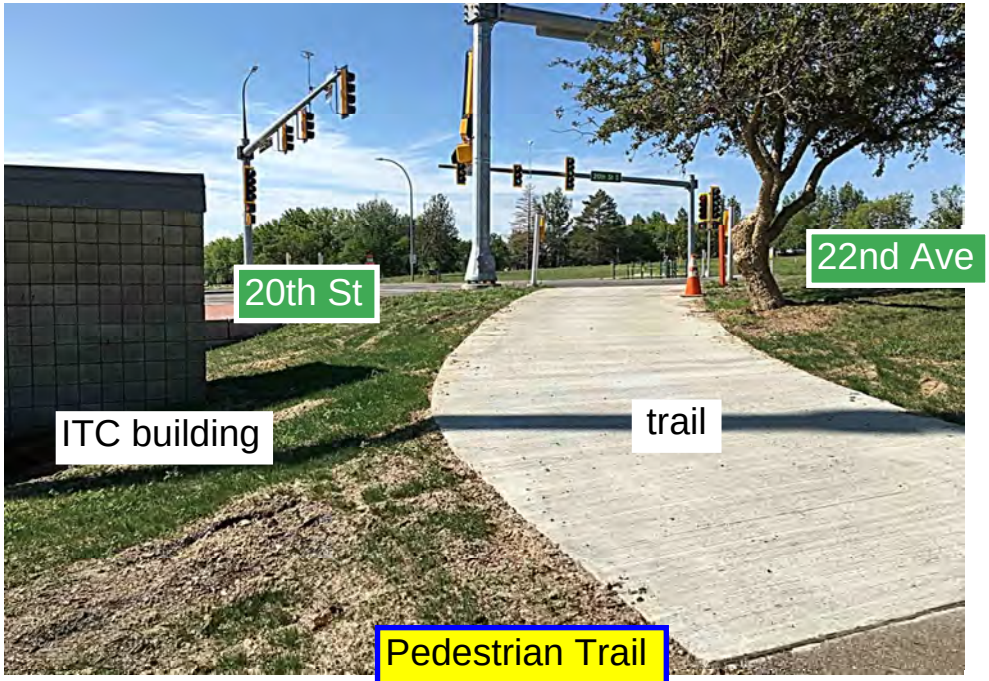
Drawn By: B.Miller
Date: 9/2/2020
Chked By: J.Unruh
Date: 9/2/2020
Revision:

Allyn Frerichs Trail Improvements
Section 4(f) and 6(f) Impacts Analysis
I-29 Exit 130 (20th Street S) Interchange - PCN 020V
Brookings, SD

Figure 2

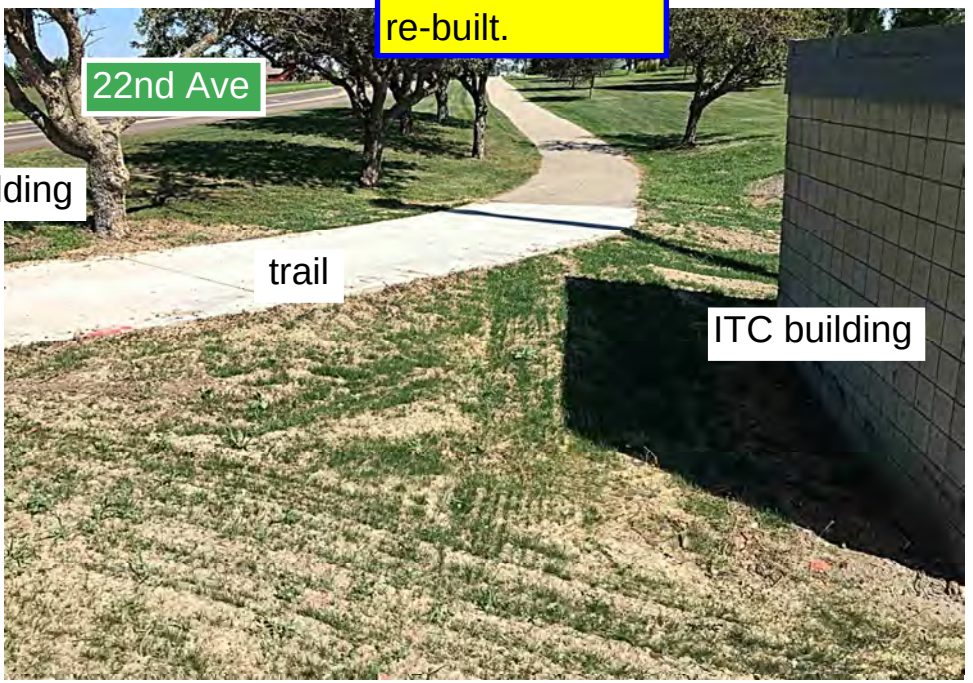
Section 6(f) Impact Mitigation Memo
Attachment A - SDGF&P Concurrence Letter from 2020





Retaining wall, ITC building, possibly the siren pole will be impacted.

Pedestrian Trail will need to be re-built.



7/29/2023 Open to Traffic Condition

Looking south along 22nd Ave


Looking west along 20th Street

Edgebrook Golf Course

20th Street S

22nd Avenue S


Looking north along 22nd Ave


Looking north along 22nd Ave

2024 Re-striping to Reduce Large Truck Conflicts

Legend
- Roadway Construction
- Sidewalk or Trail Construction
- Previously Constructed
- ROW Acquisition
- Traffic Signal Arm with Street Light

SCALE IN FEET
0 30 60

Edgebrook Golf Course

ITC Building

20th Street S

22nd Avenue S


Truck turning at 20th Street

Drawn By: B.Miller
Date: 10/31/2023
Chked By: J.Unruh
Date: 10/31/2023
Revision: 8/7/2024

20th Street S / 22nd Avenue S Intersection
Phased Improvements
I-29 Exit 130 (20th Street S) Interchange
Brookings, SD

Figure 39a

2025 Construction

Hole #4 Tee Boxes

Edgebrook Golf Course

Edge of
Hole #4 fairway

Work Limit Line

Temporary Easement for trail construction to meet ADA standards (final area pending)

Widen intersection corners for large trucks with extra ROW for ITC building relocation

8,400 Sq.Ft.
additional R.O.W.

20th Street S

624 Sq.Ft.
additional R.O.W.

22nd Avenue S

Legend

- Roadway Construction
- Sidewalk or Trail Construction
- Previously Constructed
- ROW Acquisition
- Traffic Signal Arm with Street Light

By Year 2045

Widen 22nd Avenue to 5 - 11' lanes and add right turn lane

Add right turn lane

Edgebrook Golf Course

Set roadway right-of-way limits for development plans

ITC Building

20th Street S

Set roadway right-of-way limits for development plans

Widen 22nd Avenue to 5 lanes

22nd Avenue S

SCALE IN FEET
0 30 60

Drawn By: B.Miller
Date: 10/31/2023
Chked By: J.Unruh
Date: 10/31/2023
Revision 03/2024

20th Street S / 22nd Avenue S Intersection
Phased Improvements
I-29 Exit 130 (20th Street S) Interchange
Brookings, SD

Figure
39b

Section 6(f) Impact Mitigation Memo
Attachment C - Intersection Improvement Sequence

BAI JOB # 23192-00

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	EM 0295(45)130	5	7

Plotting Date: 1-19-2021 Revision Date: Initials:

Sec. 31 - T110N - R49W

WETLAND EASEMENT
LG EVERIST ADDITION

Sec. 31 - T110N - R49W

LG Everist Inc.

SE1/4 of Section 31 - Township 110 North - Range 49 West of the 5th P.M., Exc. the West 837 Feet of the South 520.43 Feet thereof, Exc. Tract A and Tract

Tract A

City of Brookings

Parcel A3

SW1/4

10' Existing Utility Easement

33' Existing Utility Easement

33' Existing Utility Easement

20'

Section Line

33'

33'

20+00

25+00

30+00

35+00

335+00

400+00

415+00

1/4 Line

Ramp A

Ramp B

Ramp C

Ramp G

Proposed Chaparral Drive

Chaparral Drive

Block 1

MILLS
THIRD ADDITION

Access Holdings, LLC

Parcel 3

Western Estates MHP, LLC

Parcel 2

30' Existing Access Easement

10' Existing Utility Easement

Sec. 6 - T109N - R49W

RCS Development Inc.

Parcel 4

Government Lot 4

Government Lot 3

OUTLOT 1

405+00

410+00

220+00

300'

36+98.35

39+

Property

Property

33'

Section Line

Present 20th Street S

33'

1+00

2+00

3+00

4+00

51+44.75

50+00

45+00

40+00

Proposed 20th Street S

Lake Platinum, LLC

Parcel 7

Government
Lot 2

Sec. 6 - T109N - R49W

Parcel 5
106+92.72 to 108+75.49 R
Temporary Easement containing
0.1 ac (3553 sq ft) more or less

Parcel 6
106+97.88 (Ramp A) R to
45+67.65 (20th St) L
Temporary Easement containing
0.4 ac (19558 sq ft) more or less

Section 6(f) Impact Mitigation Memo
Attachment D - ROW Plan and Plats

PARCEL 3

PLAT OF LOT H2

in Block One (1), Mills Third Addition in Government Lots 3 and 4 of the Northwest Quarter (NW1/4) of Section Six (6), Township One Hundred Nine (109) North, Range Forty-nine (49) West of the 5th P.M.,

BROOKINGS COUNTY, SOUTH DAKOTA

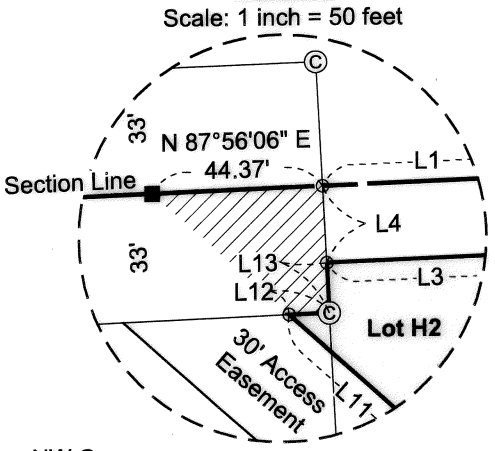
Showing a parcel of land to be acquired for highway purposes for construction Project EM 0295(45)130

Scale: 1 inch = 300 feet

LEGEND

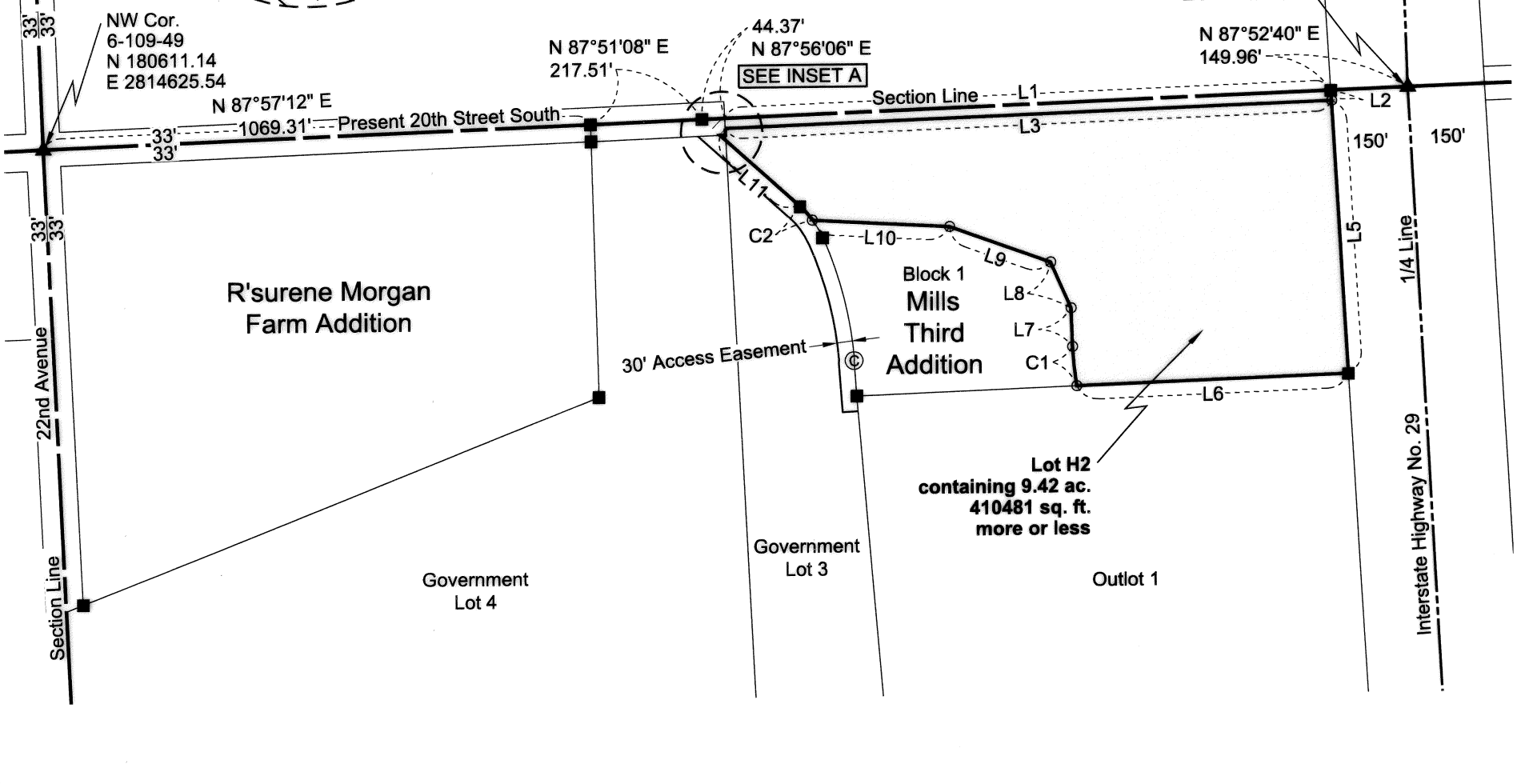
- ▨ = existing right of way
- ● = found R.O.W. corner
- ○ = set R.O.W. corner
- ▲ = found P.L.S.S. corner
- △ = set P.L.S.S. corner
- Ⓒ = calculated corner
- ■ = found property corner
- □ = set property corner
- (n) = not used for boundary location

INSET A
Scale: 1 inch = 50 feet



	Bearing	Length	Chord	Radius
L1	N 87°56'06" E	1181.36'		
L2	S 03°20'08" E	20.00'		
L3	S 87°56'06" W	1181.52'		
L4	N 02°51'37" W	20.00'		
L5	S 03°20'08" E	532.96'		
L6	S 87°55'52" W	529.00'		
C1	N 05°56'29" W	77.79'	77.73'	575.00'R
L7	N 02°03'56" W	76.36'		
L8	N 23°35'58" W	98.55'		
L9	N 70°05'26" W	208.80'		
L10	N 86°47'23" W	267.90'		
C2	N 42°08'55" W	39.48'	39.41'	187.00'L
L11	N 48°15'30" W	204.31'		
L12	N 87°51'17" E	10.49'		
L13	N 02°51'37" W	12.92'		

Existing R.O.W.
containing 0.02 ac.
903 sq ft,
more or less



Note 1: The coordinates, bearings, distances and areas shown on this plat are based on the South Dakota State Plane Coordinate System Grid North - North Zone NAD 83/2011 epoch 2010.00 Geoid 18 SF 0.9999557940

Note 2: All monumentation will be set upon project completion.

Drawn By: JLU Date: 01/19/2021
Checked By: NWN Date: 05/13/2021

SURVEYOR'S CERTIFICATE

I, NATHAN W. NIELSON, Registered Land Surveyor, in and for the State of South Dakota, do hereby certify that as ordered by the South Dakota Department of Transportation the parcel of land as shown on this plat has been surveyed at my direction and under my control, and such parcel of land shall be hereafter known by the lot number designated herein. The location and dimensions of the parcel are shown on this plat.

In witness whereof, I have hereunto set my hand and seal this 13TH day of MAY, 20 21.

REGISTERED PROFESSIONAL LAND SURVEYOR
REG. NO. 9924
NATHAN W. NIELSON
SOUTH DAKOTA

Registered Land Surveyor
Registration No. 9924

OFFICE OF REGISTER OF DEEDS

State of South Dakota
County of _____ SS

Filed for record the _____ day of _____, A.D., 20 _____ at _____ M., and recorded in Book of Plats _____ on Page _____ therein.

_____ Register of Deeds by _____ Deputy

020V

023p

PARCEL 3X

PLAT OF LOT H1

in Block One (1), Mills Third Addition in Government Lots 3 and 4 of the Northwest Quarter (NW1/4) of Section Six (6), Township One Hundred Nine (109) North, Range Forty-nine (49) West of the 5th P.M.,

BROOKINGS COUNTY, SOUTH DAKOTA

Showing a parcel of land to be acquired for highway purposes for construction Project EM 0295(45)130

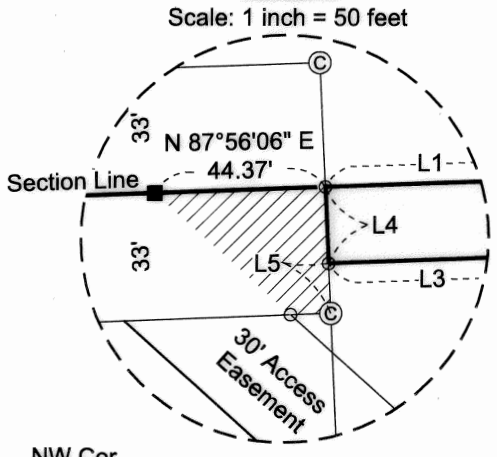
Scale: 1 inch = 300 feet

LEGEND

- ▨ = existing right of way
- ● = found R.O.W. corner
- ○ = set R.O.W. corner
- ▲ = found P.L.S.S. corner
- △ = set P.L.S.S. corner
- Ⓒ = calculated corner
- ■ = found property corner
- □ = set property corner
- (n) = not used for boundary location

INSET A

Scale: 1 inch = 50 feet



	Bearing	Length
L1	N 87°56'06" E	1181.36'
L2	S 03°20'08" E	20.00'
L3	S 87°56'06" W	1181.52'
L4	N 02°51'37" W	20.00'
L5	N 02°51'37" W	12.91'

Existing R.O.W.
containing 0.02 ac.
903 sq ft,
more or less

SW1/4

N1/4 Cor.
6-109-49
N 180707.21
E 2817286.30

Lot H1
containing 0.54 ac.
23629 sq. ft.
more or less

N 87°52'40" E
149.96'

NW Cor.
6-109-49
N 180611.14
E 2814625.54

N 87°51'08" E
217.51'

44.37'
N 87°56'06" E
SEE INSET A

N 87°57'12" E
1069.31'
Present 20th Street South

Section Line L1
L2
L3

33' 33'
150' 150'

Block 1
Mills Third Addition

R'surene Morgan
Farm Addition

30' Access Easement

22nd Avenue

Section Line

1/4 Line

Interstate Highway No. 29

Government
Lot 4

Government
Lot 3

Outlot 1

Note 1: The coordinates, bearings, distances and areas shown on this plat are based on the South Dakota State Plane Coordinate System Grid North - North Zone NAD 83/2011 epoch 2010.00 Geoid 18 SF 0.9999557940

Note 2: All monumentation will be set upon project completion.

Drawn By: JLU Date: 01/19/2021
Checked By: NWN Date: 05/13/2021

SURVEYOR'S CERTIFICATE

I, NATHAN W. NIELSON, Registered Land Surveyor, in and for the State of South Dakota, do hereby certify that as ordered by the South Dakota Department of Transportation the parcel of land as shown on this plat has been surveyed at my direction and under my control, and such parcel of land shall be hereafter known by the lot number designated herein. The location and dimensions of the parcel are shown on this plat.

In witness whereof, I have hereunto set my hand and seal this 13TH day of MAY, 20 21.

REGISTERED PROFESSIONAL LAND SURVEYOR
REG. NO. 9924
NATHAN W. NIELSON
SOUTH DAKOTA

Registered Land Surveyor
Registration No. 9924

OFFICE OF REGISTER OF DEEDS

State of South Dakota
County of _____ SS

Filed for record the _____ day of _____, A.D., 20 _____ at _____ M., and recorded in Book of Plats _____ on Page _____ therein.

_____ Register of Deeds by _____ Deputy

020V

023p

2020 EA Agency Coordination Relevant to Section 6(f) Mitigation Area

Department of Transportation
Environmental Office
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
605/773-4336

March 25, 2020

Hilary Meyer
SD Dept. of Game, Fish & Parks
523 E. Capitol Ave
Pierre, SD 57501

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Ms. Meyer:

The City of Brookings (the City), in conjunction with South Dakota Department of Transportation (SDDOT) and Federal Highway Administration (FHWA) are initiating a study to evaluate alternatives for a new interchange on Interstate 29 (I-29) at 20th Street South (20th St S). See attached for a figure of the project location. Please comment on any of the following topics that pertain to your agency:

1. Wetland Locations	6. Parks
2. Threatened or Endangered Species	7. Land & Water Conservation Funds
3. Refuges	8. Aquatic Invasive Species
4. SDGF&P Game Production Areas	
5. SDGF&P Recreation Areas	

Please submit your comments as soon as possible, so that the project's environmental documentation can be completed, and the project can be let and constructed in a timely manner.

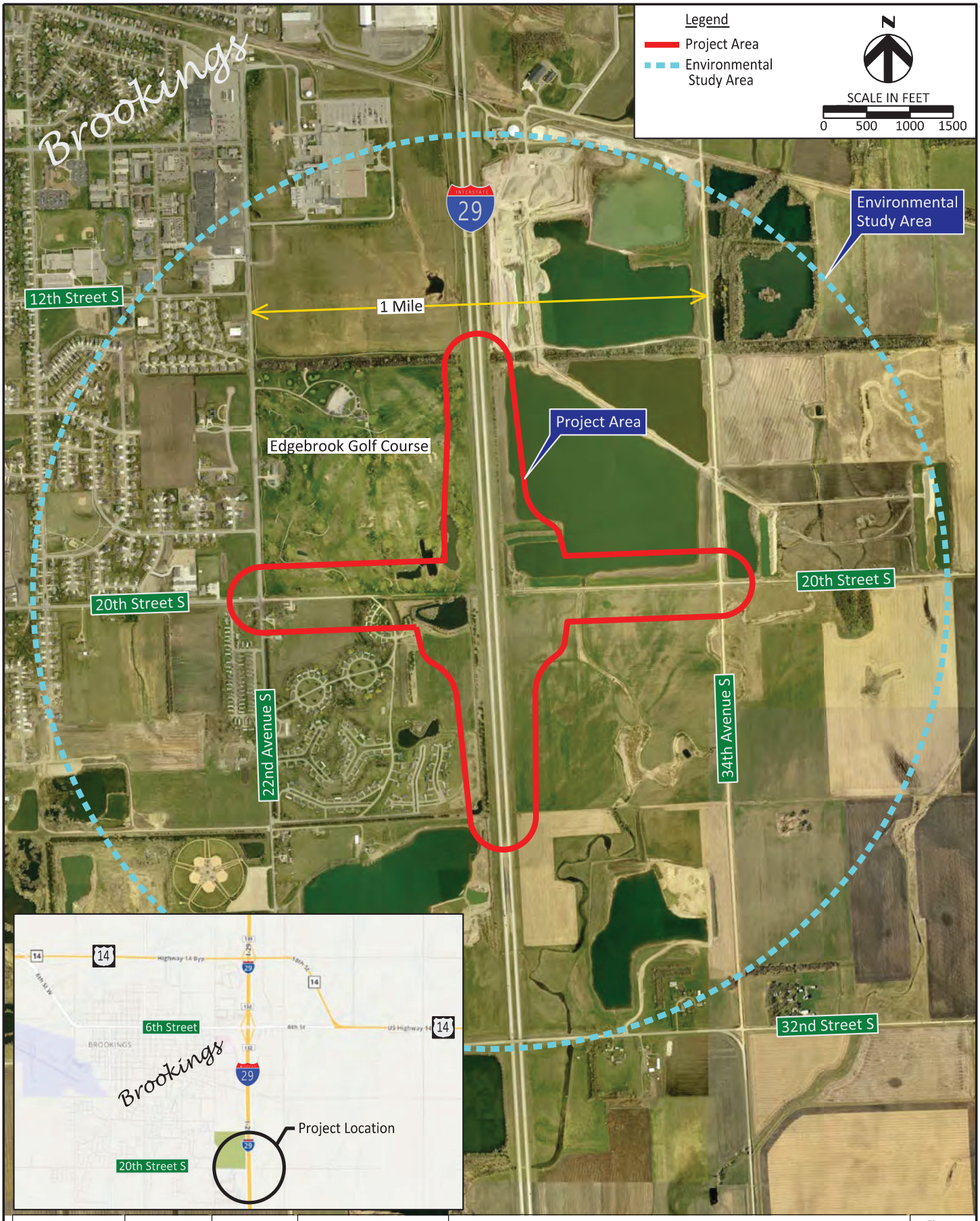
Sincerely,

Joanne M. Hight

Joanne Hight
Environmental Engineer Manager
605.773.3721

Attachment

Cc: Randy Kittle



Drawn By: B.Miller
Date: 3/25/2020
Chked By: J.Unruh
Date: 3/25/2020
Revision:

Project Location and Study Area

I-29 Exit 130 (20th Street S) Interchange
Environmental Study - PCN 020V
Brookings, SD

Figure 1

Department of Transportation
Environmental Office
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
605/773-4336

March 25, 2020

Patrick Snyder
SD Dept. of Environment & Natural Resources
Joe Foss Building
Pierre, SD 57501-3181

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Mr. Snyder:

The City of Brookings (the City), in conjunction with South Dakota Department of Transportation (SDDOT) and Federal Highway Administration (FHWA) are initiating a study to evaluate alternatives for a new interchange on Interstate 29 (I-29) at 20th Street South (20th St S). See attached for a figure of the project location. Please comment on any of the following topics that pertain to your agency:

1. Water Quality Standards
2. Air Quality
3. Hazardous Waste
4. Underground Storage Tanks
5. Contaminated Soils

Please submit your comments as soon as possible, so that the project's environmental documentation can be completed, and the project can be let and constructed in a timely manner.

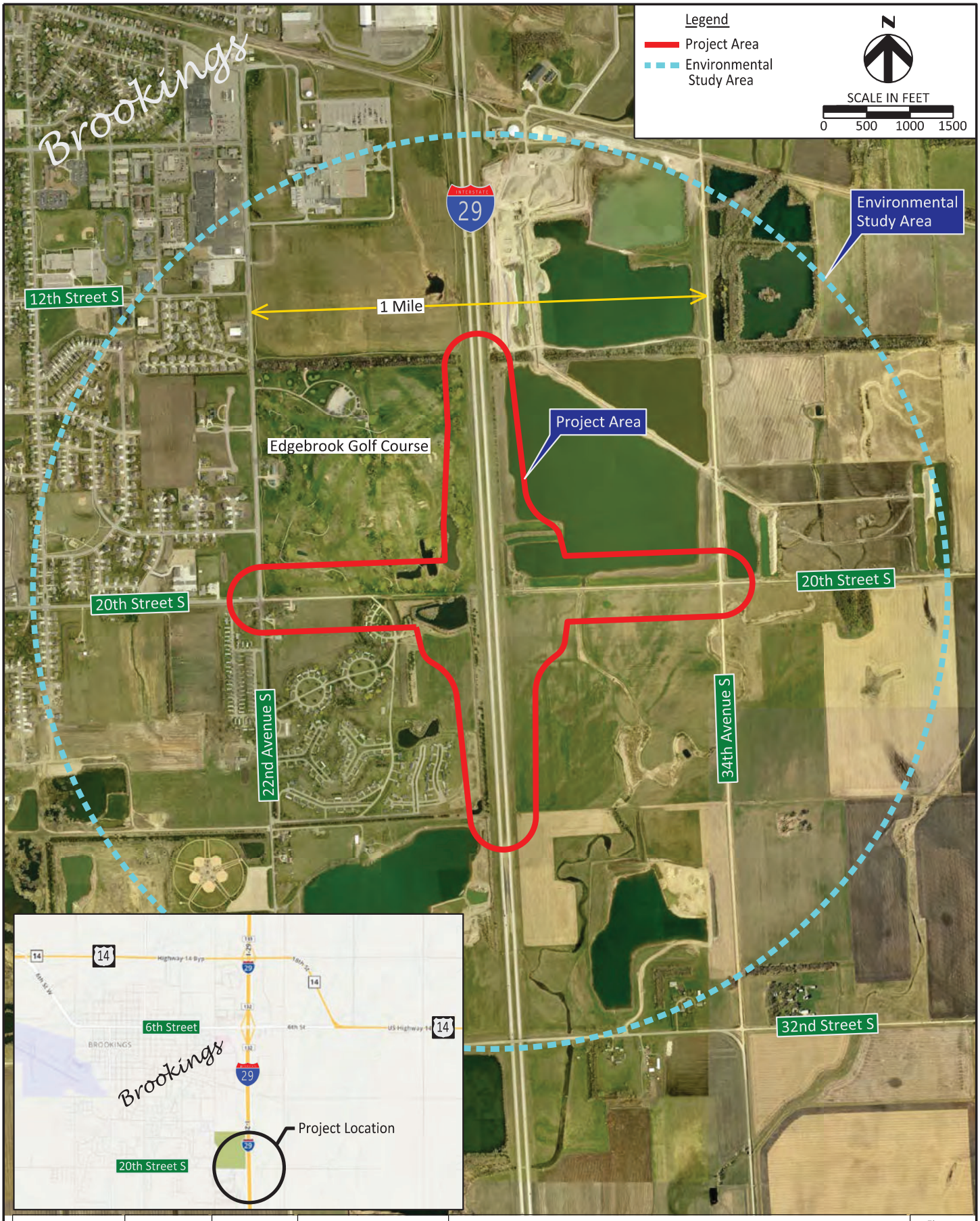
Sincerely,

Joanne M. Hight

Joanne Hight
Environmental Engineer Manager
605.773.3721

Attachment

Cc: Shannon Minerich, DENR
Nicole Stasch, DENR
Terry Florentz, DENR



Drawn By: B.Miller
Date: 3/25/2020
Chked By: J.Unruh
Date: 3/25/2020
Revision:

Project Location and Study Area

I-29 Exit 130 (20th Street S) Interchange
Environmental Study - PCN 020V
Brookings, SD

Figure 1

Department of Transportation
Environmental Office
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
605/773-4336

August 24, 2020

Scott Larson, Field Supervisor
U.S. Fish & Wildlife Service
420 Garfield - Suite 400
Pierre, SD 57501-5408

RE: Project EM 0295(45)130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way, and Design

Dear Mr. Larson:

Attached is information on the above project for your review and comment. The City of Brookings, in conjunction with the South Dakota Department of Transportation and the Federal Highway Administration, are initiating a study to evaluate alternatives for a new interchange on Interstate 29 at 20th Street South. The project location figure, a figure showing probable impacted tree removal areas in the project area, and the Northern Long-eared Bat Habitat Assessment Data Sheet are attached for your review.

According to the U.S. Fish & Wildlife Service Information for Planning and Consultation (IPAC) database (Consultation code: 06E14000-2020-SLI-0642), the following species are known to occur in the Project Area in Brookings County:

Species	Status	SDDOT Determination	Comments
Northern Long-eared Bat (*Myotis septentrionalis*)	Threatened	May Affect, Not Likely to Adversely Affect	Suitable habitat is present; tree removal will occur outside the active season
Red Knot (*Calidris canutus rufa*)	Threatened	No Effect	No suitable habitat present
Dakota Skipper (*Hesperia dacotae*)	Threatened	No Effect	No suitable habitat present
Poweshiek Skipperling (*Oarisma poweshiek*)	Endangered	No Effect	No suitable habitat present
Western Prairie Fringed Orchid (*Platanthera praeclara*)	Threatened	No Effect	No suitable habitat present

A consistency letter through IPAC was not able to be generated due to project activities occurring greater than 300 feet from existing road surfaces. Currently, 20th Street South ends approximately 0.25-mile west of Interstate 29 (I-29) and resumes immediately east of I-29. An improved roadway from I-29 to 0.25-mile west of I-29, south of the Edgebrook Golf Course, does not exist. The project would extend 20th Street South across I-29 and create a new interchange at Exit 130, providing a much-needed point of access for the City of Brookings.

Tree removal will be required for the anticipated construction of the project and will occur in a timeframe from November 1st to April 14th, outside the active maternity and pup-rearing season of the NLEB. Suitable NLEB habitat areas where removal will likely be required for project

construction are identified on the attached figure. Trees required to be removed will be clearly marked in the field. Due to tree removal activities occurring outside the active season of the NLEB, the SDDOT has made the preliminary effect determination of *may affect, not likely to adversely affect* for the NLEB.

The project may impact aquatic resources and will be reviewed for wetland impacts. The project will comply with all federal and state environmental regulations.

Please submit your comments as soon as possible, so that the project's environmental documentation can be completed.

Sincerely,

Joanne M. Hight

Joanne Hight
Environmental Engineer Manager
605.773.3721
Attachments

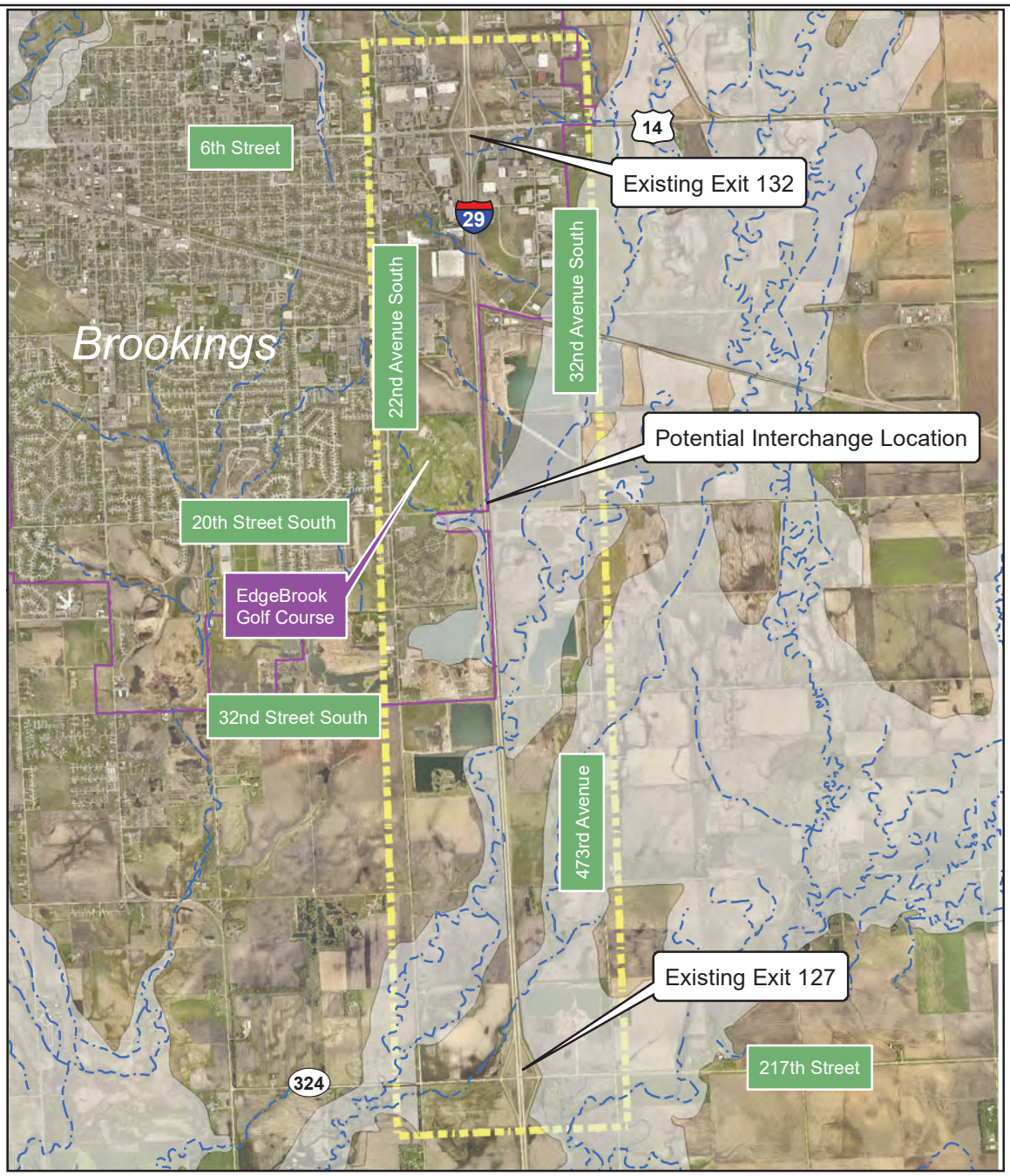


Figure 1. Project Location

I-29 Exit 130 (20th Street South) Interchange Study,
Environmental Study, Right-of-Way, Acquisition & Design

EM 0295(45) 130, PCN 020V

Brookings, South Dakota

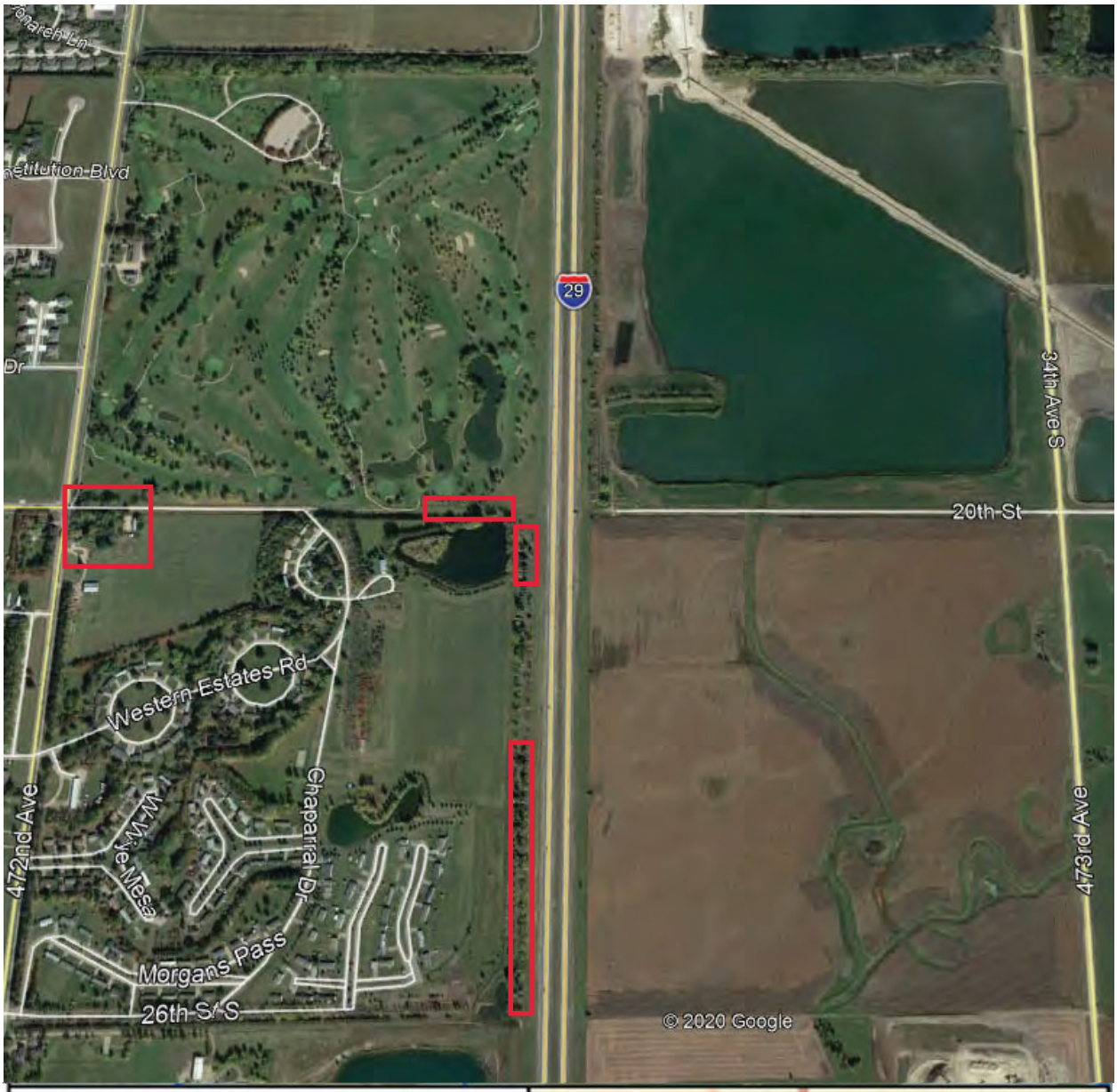
Legend

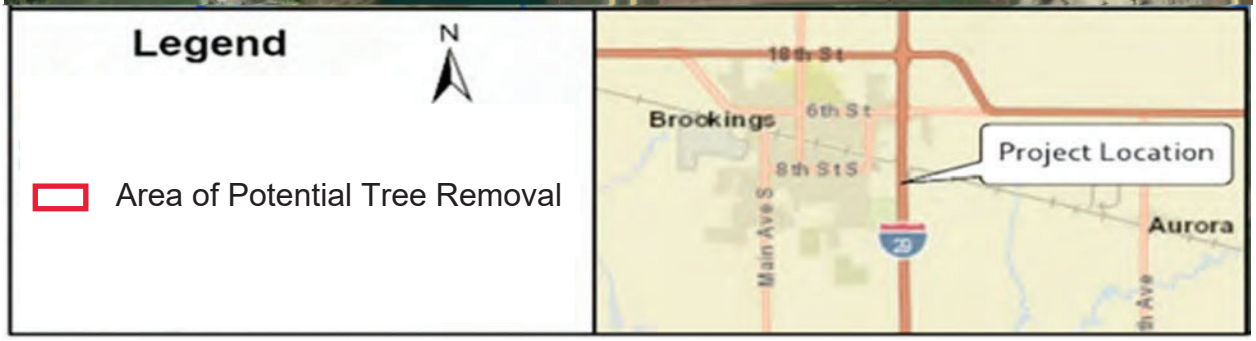
- Study Area
- City Limits
- NHD Streams
- Zone A- Designated Floodplain

0 0.2750.55 1.1 1.65 Miles

brookings SOUTH DAKOTA

South Dakota DOT
Connecting South Dakota and the Nation





Project EM 0295(45)130 PCN020V

Brookings County – I-29 Exit 130 (20th Street South) Interchange

Tree Removal Locations

Phase I Summer Habitat Assessments
Northern Long-Eared Bat Habitat Assessment Data Sheet

South Dakota Department of Transportation
Office of Project Development-Environmental
Becker-Hansen Building
700 E. Broadway Ave.
Pierre, SD 57501-2586

Date: 5 / 12 / 20

Surveyor: Kendall Vande Kamp & Caiti Murphy
Phone (605) 773-3721
http://www.sddot.com/business/environmental/Default.aspx

General Project Information

Project/PCN 020V

Station #

MRM #

Structure #

County Brookings

Multiple Sample Sites? ○ Yes, See Comments ◉ No

Habitat (trees) within 1000' of bridge? ○ Yes ◉ No

◉ Survey Complete

Brief Project Description

The project would consist of constructing a new I29 interchange at 20th Street South in Brookings South Dakota. Approach grading to the interchange from 22nd Avenue South and 34th Avenue South would also be needed.

Project Area

	Total acres	Forest acres	Open acres
Project (Acres of site being surveyed)	200	50	150

	Completely Cleared	Partially Cleared (Leave Some trees)	Preserve acres (no clearing)
Proposed tree removal (acres) ☐ No Removal	3.13		

Vegetation cover types

Pre-project	Other Coniferous	Other Deciduous	-	-	-
	-	-	-	-	-

Post-project

Overall, the vegetation structure throughout the majority of the project area would remain the same. Portions of the project area

Landscape within 5-Mile Radius

Flight corridors to other forested areas? (If yes, Describe. e.g. shelterbelt, forested, forested creek bottom, forested river bottom)

◉ Yes The Big Sioux River - forested river bottom & shelterbelts ○ No

Describe adjacent properties (e.g., forested, grassland, commercial or residential development, water sources).

Shelterbelt Residential Commercial

Proximity to public land (15 Mile Radius)

What is the distance in miles from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas or wildlife management areas)?

Oakwood Lake State Park is approximately 15 miles to the northwest and is the closest public land might be classified as "forested". Oak Lake Field Station is located approximately 19 miles to the north east. Hole in the Mountain County Park is located in Lake Benton approximately 20 miles to the east.

Although it might not meet the definition of "forested". The nearest public land that contains trees is the Dakota Nature Park just under a mile to the southwest.

Northern Long-Eared Bat Habitat Assessment Data Sheet (continued)

Additional information about discreet habitat types at multiple sites

Use additional sheets to assess discrete habitat types at multiple sites in a project area. Include a map depicting sample sites in project area. A single sheet can be used for multiple sample sites if the habitat is the same.

Sample Site Description (Station # / MRM#)

Sample site no. 20th Street Interchange Project Area.

Sample site no.

Water Resources at Sample Site

Stream type (# and length in FT)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources
		340		Excavated borrow pits and associated drains provides potential summer water source.
Pools/ponds (# and size in acres)		Open and accessible to bats?		
	140		Yes	
Wetlands (Approx. acres)	Permanent	Seasonal		○ No Water Source
	8.0	10.0		

Forest Resources at Sample Site

	Canopy (>50')	Midstory (20-50')	Understory (<20')
Closure/density (Use 1-6 from far right table)	1	1	1
Dominant species of mature trees	Other Deciduous	Other Deciduous	Other Deciduous
% of trees with exfoliating bark	5	2	1

1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%

Size composition of live trees (%)	Small (3-8 in.)	Med. (9-15 in.)	Large (>15 in.)
	40	50	10

Total # of suitable snags: 10

☐ No Forest Resources

(Suitable snags are standing dead trees with exfoliating bark, cracks, crevices or hollows.)

Conclusion

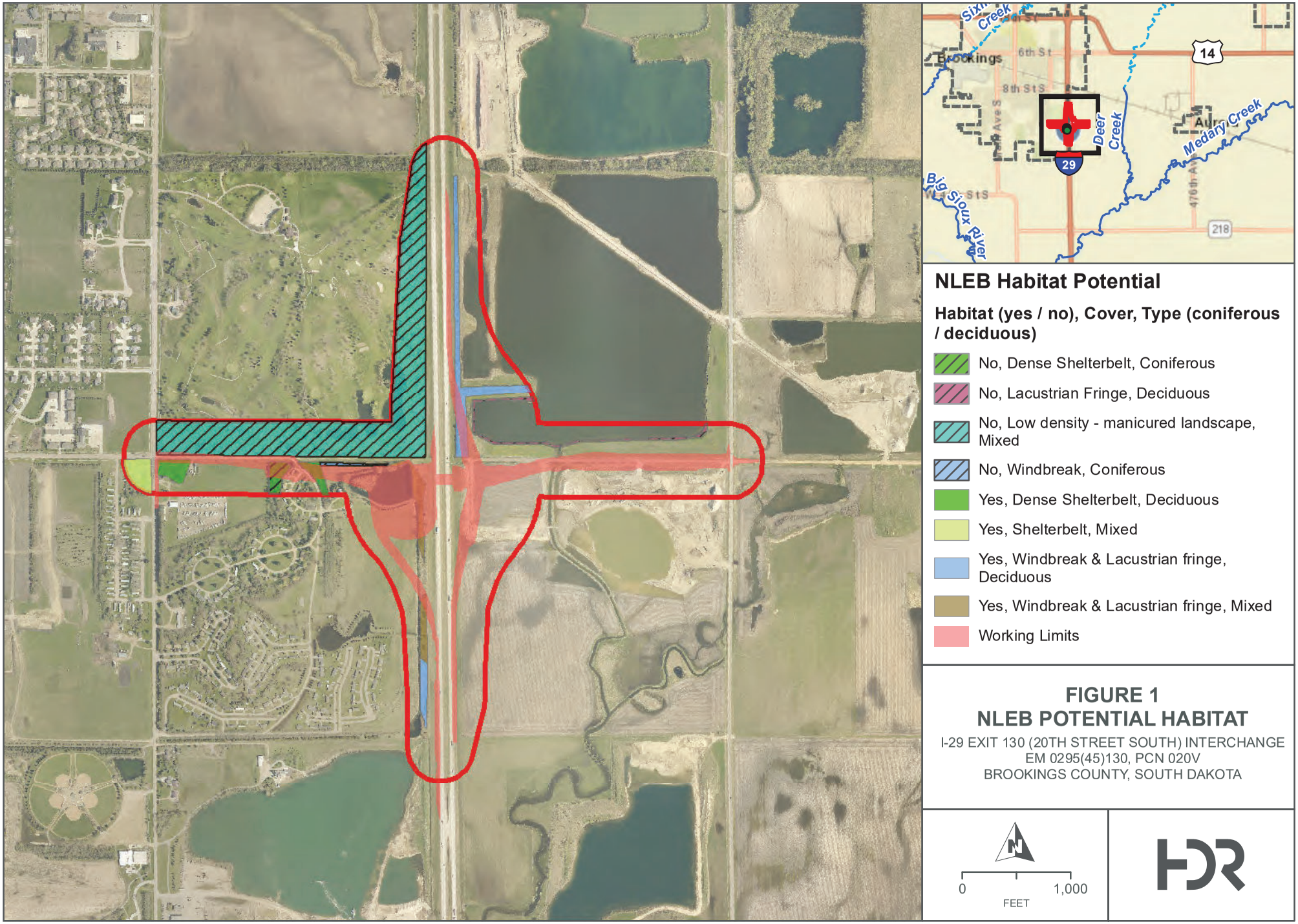
IS THE HABITAT SUITABLE FOR NORTHERN LONG-EARED BATS? Yes

Additional comments:

This data form characterizes the forest resources throughout the project area as a whole. Attached is a map that maps dichotomous "forested" areas at a smaller spatial scale with regards to whether they provide suitable NLEB habitat, cover description, and type (coniferous, deciduous, or mixed). Also attached are representative photos of forested areas within the project area.

Attach aerial map of project site with all forested areas labeled and a general description of the habitat.

Photographic documentation should include: habitat shots at edge and interior from multiple locations; canopy, midstory, understory; examples of potential suitable snags and live trees; and water resources.



PATH: H:\GIS\PROJECTS\CITY_OF_BROOKINGS\I29_EXIST130_20THST_INTERCHANGE_10220242\MAP_DOCS\NLEB\NLEB_HABITAT_FORM_ATTACHMENT_V2.MXD - USER: KVANDEKA - DATE: 8/20/2020

Photo 1: Facing south towards windbreak west of I29.

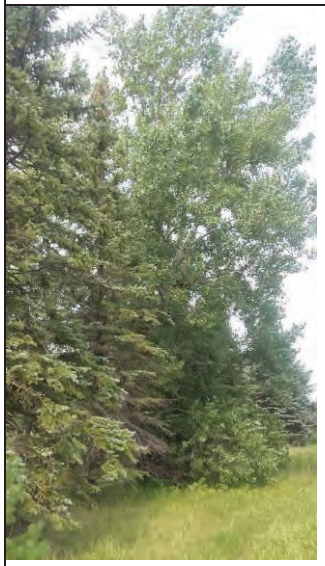


Photo 2: Representative mixed forest just west of I29 southbound.

Photo 3: Representative coniferous tree just west of I29 southbound.

Photo 4: Larger tree just west of I29 south bound.

Photo 5: Larger tree just west of I29 south bound.

Photo 6: Representative midstory windbreak trees west of I29 south

Photo 7: Representative crevice in tree west of I29 south bound.

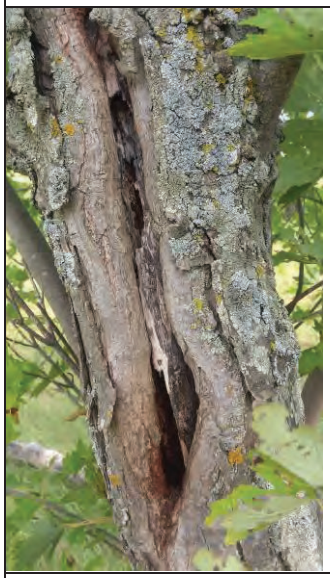


Photo 8: Representative crevice in tree west of I29 south bound.

Photo 9: Representative large green ash west of I29 south bound.

Photo 10: Open water pond west of I29 south bound.

Photo 11: Open water pond west of I29 south bound.

Photo 12: Facing coniferous windbreak. South of golf course.

Photo 13: Tributary east of I29.

Photo 14: Facing west down 20th Street. South of golf course.

Photo 15: Facing west down 20th Street. South of golf course.

Photo 16: Facing south down drainage ditch west of I29.

Photo 17: Facing west toward dense shelterbelt at 20th St S. and 22nd Ave S. intersection.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Dakota Ecological Services Field Office
420 South Garfield Avenue, Suite 400
Pierre, SD 57501-5408
Phone: (605) 224-8693 Fax: (605) 224-1416
http://www.fws.gov/southdakotafieldoffice/

In Reply Refer To: April 17, 2020
Consultation Code: 06E14000-2020-SLI-0642
Event Code: 06E14000-2020-E-01681
Project Name: I29 Exit 130 (20th Street South) Interchange

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Migratory Bird Treaty Act (16 U.S.C. 703-712, as amended), as well as the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Projects affecting these species may benefit from the development of an Eagle Conservation Plan (ECP), see guidance at this website (http://www.fws.gov/windenergy/eagle_guidance.html). An ECP can assist developers in achieving compliance with regulatory requirements, help avoid “take” of eagles at project sites, and provide biological support for eagle permit applications. Additionally, we recommend wind energy developments adhere to our Land-based Wind Energy Guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

We have recently updated our guidelines for minimizing impacts to migratory birds at projects that have communication towers (including meteorological, cellular, digital television, radio, and emergency broadcast towers). These guidelines can be found at:

http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm
http://www.towerkill.com

According to National Wetlands Inventory maps, (available online at http://wetlands.fws.gov/) wetlands exist adjacent to the proposed construction corridor. If a project may impact wetlands or other important fish and wildlife habitats, the U.S. Fish and Wildlife Service (Service), in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347) and other environmental laws and rules, recommends complete avoidance of these areas, if possible. If this is not possible, attempts should be made to minimize adverse impacts. Finally if adverse impacts are unavoidable, measures should be undertaken to replace the impacted areas. Alternatives should be examined and the least damaging practical alternative selected. If wetland impacts are unavoidable, a mitigation plan addressing the number and types of wetland acres to be impacted, and the methods of replacement should be prepared and submitted to the resource agencies for review.

Please check with your local wetland management district to determine whether Service interest lands exist at the proposed project site, the exact locations of these properties, and any additional restrictions that may apply regarding these sites. The Offices are listed below. If you are not sure which office to contact, we can help you make that decision.

U.S. Fish and Wildlife Service, Huron Wetland Management District, Federal Building, Room 309, 200 4th Street SW, Huron, SD 57350; telephone (605) 352-5894. Counties in the Huron WMD: Beadle, Buffalo, Hand, Hughes, Hyde, Jerauld, Sanborn, Sully.

U.S. Fish and Wildlife Service, Lake Andes Wetland Management District, 38672 291st Street, Lake Andes, South Dakota; telephone (605) 487-7603. Counties in the Lake Andes WMD: Aurora, Bon Homme, Brule, Charles Mix, Clay, Davison, Douglas, Hanson, Hutchinson, Lincoln, Turner, Union, Yankton.

U.S. Fish and Wildlife Service, Madison Wetland Management District, P.O. Box 48, Madison, South Dakota, 57042, telephone (605) 256-2974. Counties in the Madison WMD: Brookings, Deuel, Hamlin, Kingsury, Lake, McCook, Miner, Minnehaha, Moody.

U.S. Fish and Wildlife Service, Sand Lake Wetland Management District, 39650 Sand Lake Drive, Columbia, South Dakota, 57433; telephone (605) 885-6320. Counties in the Sand Lake WMD: Brown, Campbell, Edmunds, Faulk, McPherson, Potter, Spink, Walworth.

U.S. Fish and Wildlife Service, Waubay Wetland Management District, 44401 134A Street, Waubay, South Dakota, 57273; telephone (605) 947-4521. Counties in the Waubay WMD: Clark, Codington, Day, Grant, Marshall, Roberts.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

You are welcome to contact our office at the address or phone number above for more information.

Thank you.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

South Dakota Ecological Services Field Office
420 South Garfield Avenue, Suite 400
Pierre, SD 57501-5408
(605) 224-8693

Project Summary

Consultation Code: 06E14000-2020-SLI-0642

Event Code: 06E14000-2020-E-01681

Project Name: I29 Exit 130 (20th Street South) Interchange

Project Type: TRANSPORTATION

Project Description: The project would construct an interchange on Interstate 29 (I-29) at 20th Street South in the City of Brookings, South Dakota.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/44.2824778479752N96.75829216485886W

Counties: Brookings, SD

Endangered Species Act Species

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Red Knot *Calidris canutus rufa* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

Insects

NAME	STATUS
Dakota Skipper *Hesperia dacotae* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1028	Threatened
Poweshiek Skipperling *Oarisma poweshiek* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9161	Endangered

Flowering Plants

NAME	STATUS
Western Prairie Fringed Orchid *Platanthera praeclara*	Threatened

No critical habitat has been designated for this species.

Species profile: https://ecos.fws.gov/ecp/species/1669

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Bittern *Botaurus lentiginosus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/6582	Breeds Apr 1 to Aug 31
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31

NAME	BREEDING SEASON
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Dunlin *Calidris alpina arcticola* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Franklin's Gull *Leucophaeus pipixcan* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-eared Owl *asio otus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3631	Breeds Mar 1 to Jul 15
Marbled Godwit *Limosa fedoa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds May 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Semipalmated Sandpiper *Calidris pusilla* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the

FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

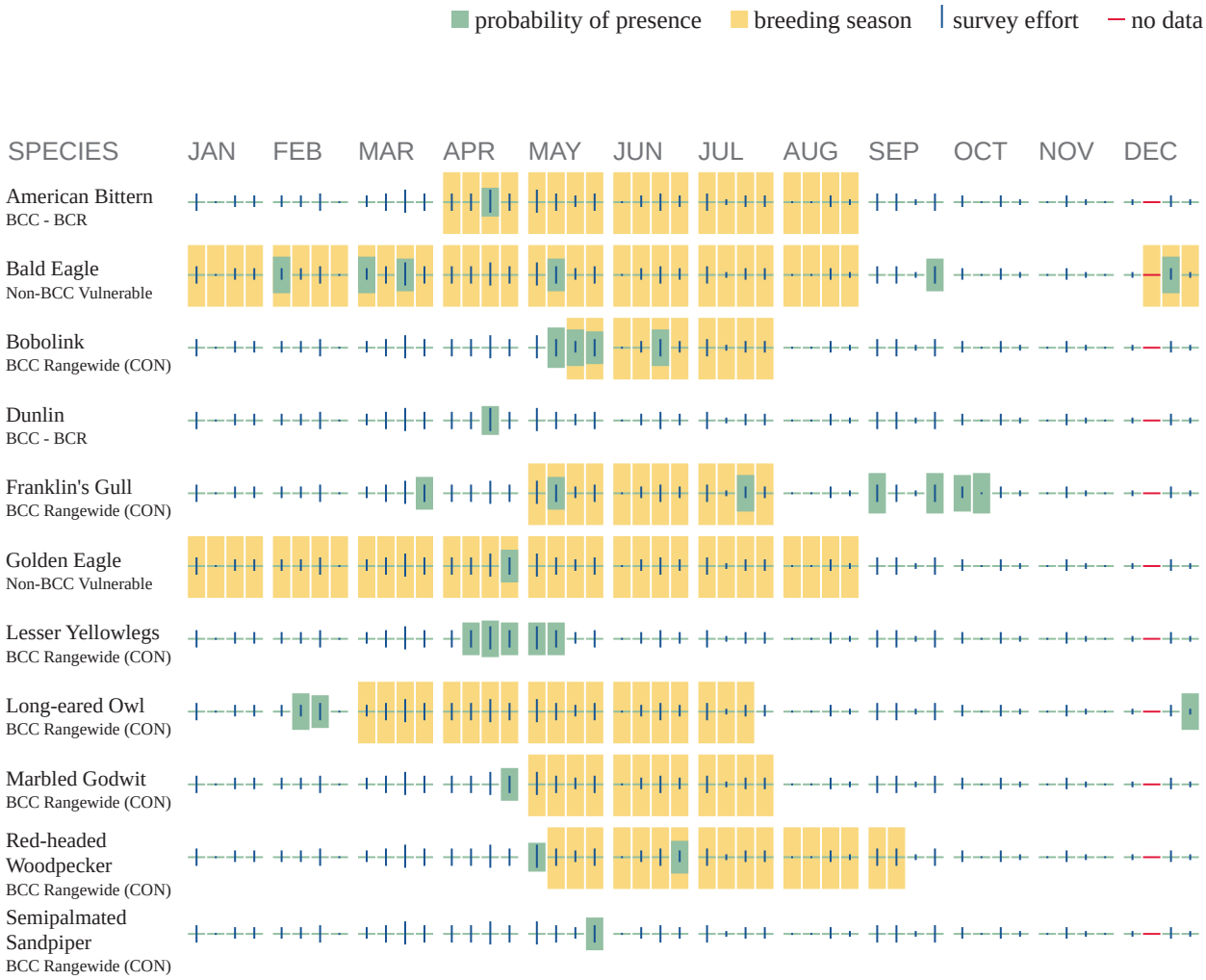
1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your

project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that

overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER POND

- Palustrine

RIVERINE

- Riverine

Banner Associates, Inc.
2307 W 57th St, Ste 102
Sioux Falls, SD 57108
Tel 605.692.6342
Toll Free 855.323.6342
www.bannerassociates.com

April 23, 2020

Staci Bungard, Floodplain Administrator
City of Brookings Planning & Zoning
520 3rd Street, Suite 230
Brookings, SD 57006

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Ms. Bungard:

This letter is to introduce the above-mentioned project and to initiate coordination with your office. The City of Brookings, South Dakota Department of Transportation (SDDOT), and Federal Highway Administration (FHWA) have initiated this project to study alternatives and identify the preferred alternative for a new interchange on Interstate 29 (I-29) at 20th Street South within Brookings, SD. Attached is a map showing the location of the above project. The project will comply with all federal and state regulations.

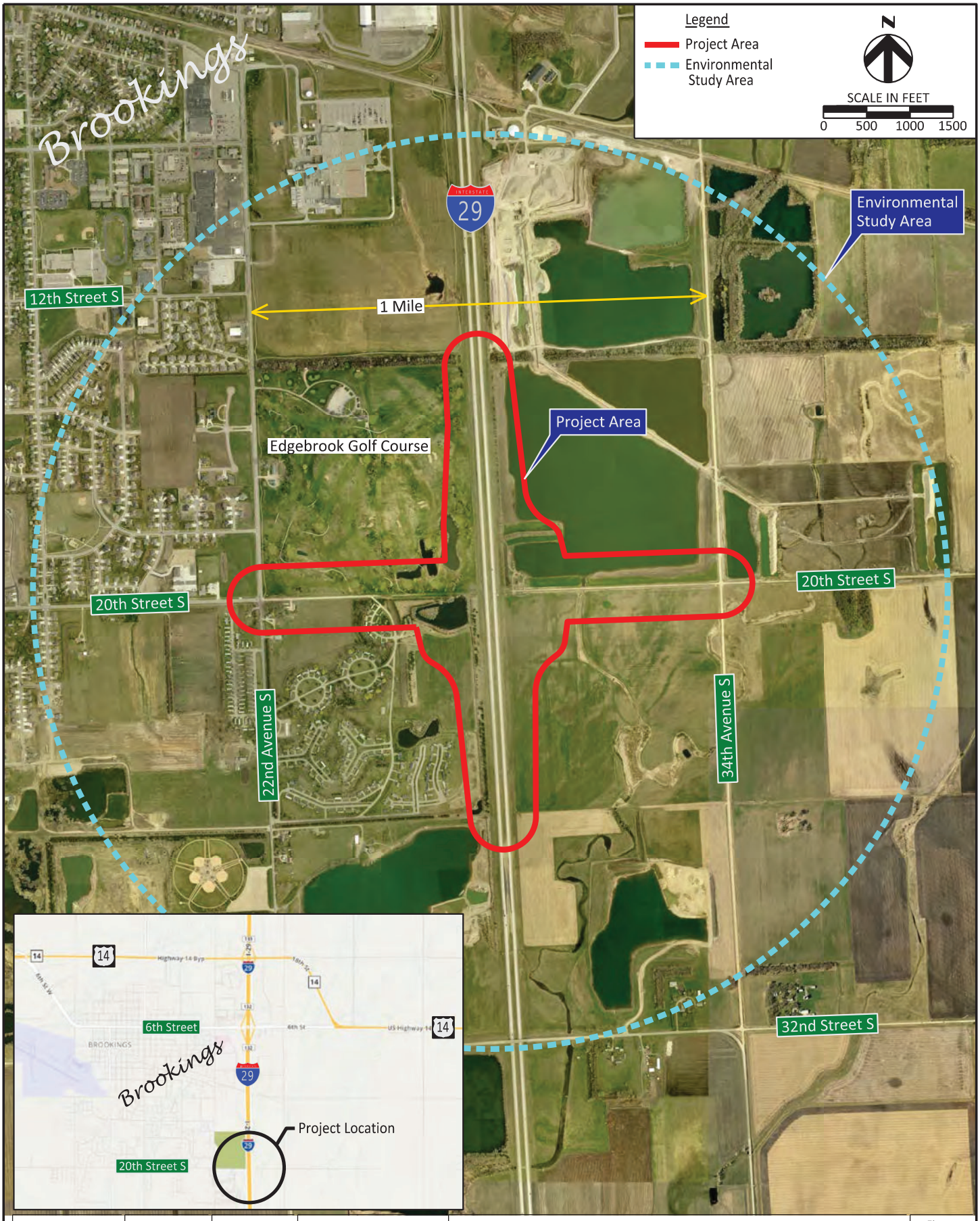
The project is located within City of Brookings and Brookings County limits. We are also sending a coordination letter to the floodplain administrator for Brookings County. Preliminary alternatives were identified during the previously completed studies. Currently these alternatives are being refined and the resources within the study area are being identified. We have also identified the presence of designated floodplain, Zone A, in the study area. After the alternatives are refined, potential impacts to the resources, including floodplain, will be determined. We will continue to coordinate with your office after the potential impacts are identified for the alternatives.

As the project proceeds, we will continue to coordinate with your department as information becomes available on any effects to any recreational resources. If you have any comments or questions, please feel free to contact me or provide comments to beckyb@bannerassociates.com.

Sincerely,

Becky Baker
Environmental Department Head
605.690.2190

Attachments



Drawn By: B.Miller
Date: 3/25/2020
Chked By: J.Unruh
Date: 3/25/2020
Revision:

Project Location and Study Area

I-29 Exit 130 (20th Street S) Interchange
Environmental Study - PCN 020V
Brookings, SD

Figure 1

Banner Associates, Inc.
2307 W 57th St, Ste 102
Sioux Falls, SD 57108
Tel 605.692.6342
Toll Free 855.323.6342
www.bannerassociates.com

April 23, 2020

Robert Hill
Brookings County, Floodplain Administrator
520 3rd Street, Suite 200
Brookings, SD 57006

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Mr. Hill:

This letter is to introduce the above-mentioned project and to initiate coordination with your office. The City of Brookings, South Dakota Department of Transportation (SDDOT), and Federal Highway Administration (FHWA) have initiated this project to study alternatives and identify the preferred alternative for a new interchange on Interstate 29 (I-29) at 20th Street South within Brookings, SD. Attached is a map showing the location of the above project. The project will comply with all federal and state regulations.

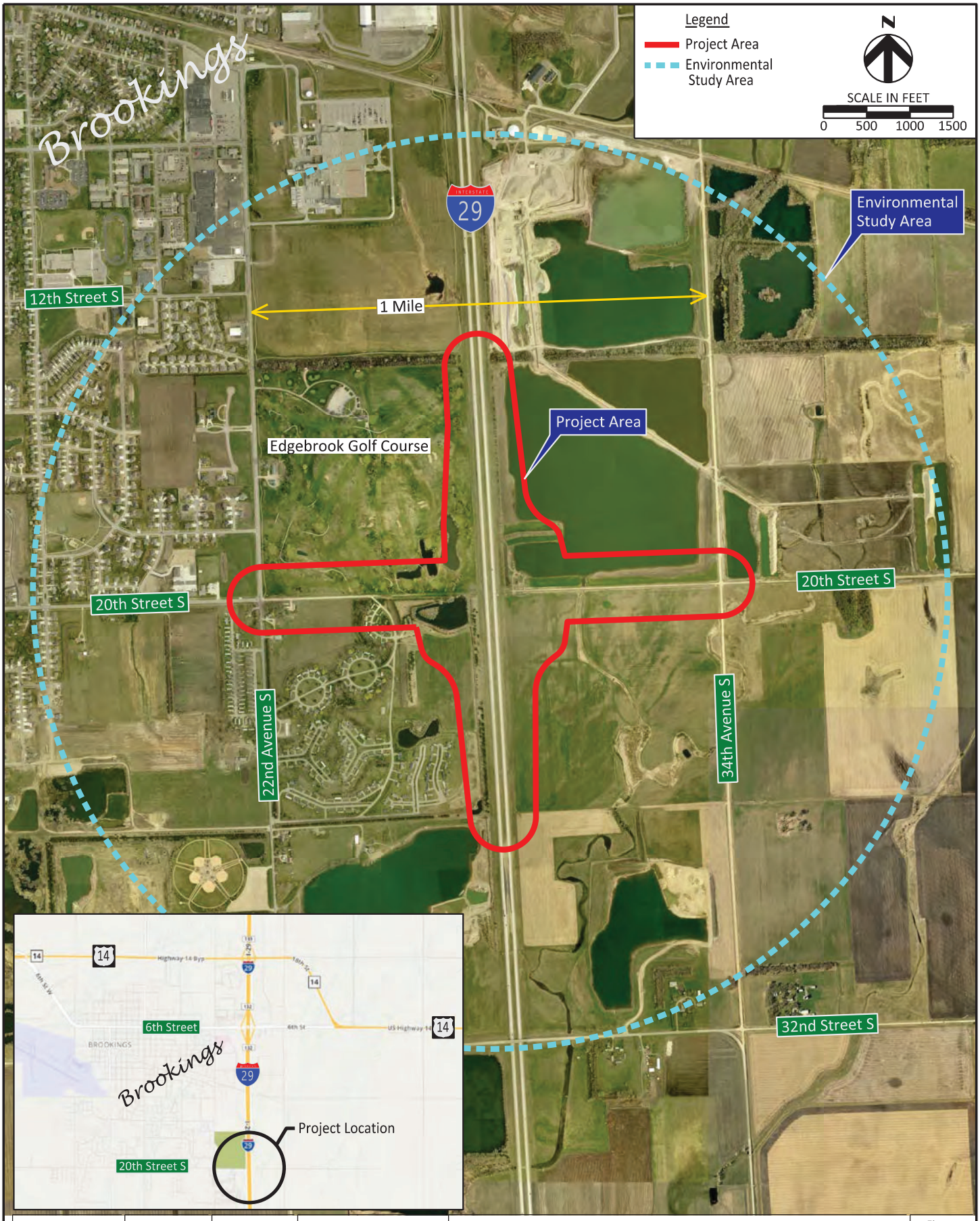
The project is located within City of Brookings and Brookings County limits. We are also sending a coordination letter to the floodplain administrator for the City of Brookings. Preliminary alternatives were identified during the previously completed studies. Currently the alternatives are being refined and the resources within the study area are being identified. We have also identified the presence of designated floodplain, Zone A, in the study area. After the alternatives are refined, potential impacts to the resources, including floodplain, will be determined. We will continue to coordinate with your office after the potential impacts are identified for the alternatives.

As the project proceeds, we will continue to coordinate with your department as information becomes available on any effects to any recreational resources. If you have any comments or questions, please feel free to contact me or provide comments to beckyb@bannerassociates.com.

Sincerely,

Becky Baker
Environmental Department Head
605.690.2190

Attachments



Drawn By: B.Miller
Date: 3/25/2020
Chked By: J.Unruh
Date: 3/25/2020
Revision:

Project Location and Study Area

I-29 Exit 130 (20th Street S) Interchange
Environmental Study - PCN 020V
Brookings, SD

Figure 1

Banner Associates, Inc.
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Sioux Falls, SD 57108
Tel 605.692.6342
Toll Free 855.323.6342
www.bannerassociates.com

April 23, 2020

Dusty Rodiek, Director
City of Brookings Parks, Recreation & Forestry
520 3rd Street, Suite 130
Brookings, SD 57006

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Mr. Rodiek:

This letter is to introduce the above-mentioned project and to initiate coordination with your office. The City of Brookings, South Dakota Department of Transportation (SDDOT), and Federal Highway Administration (FHWA) have initiated this project to study alternatives and identify the preferred alternative for a new interchange on Interstate 29 (I-29) at 20th Street South within Brookings, SD. Attached is a map showing the location of the above project. The project will comply with all federal and state regulations.

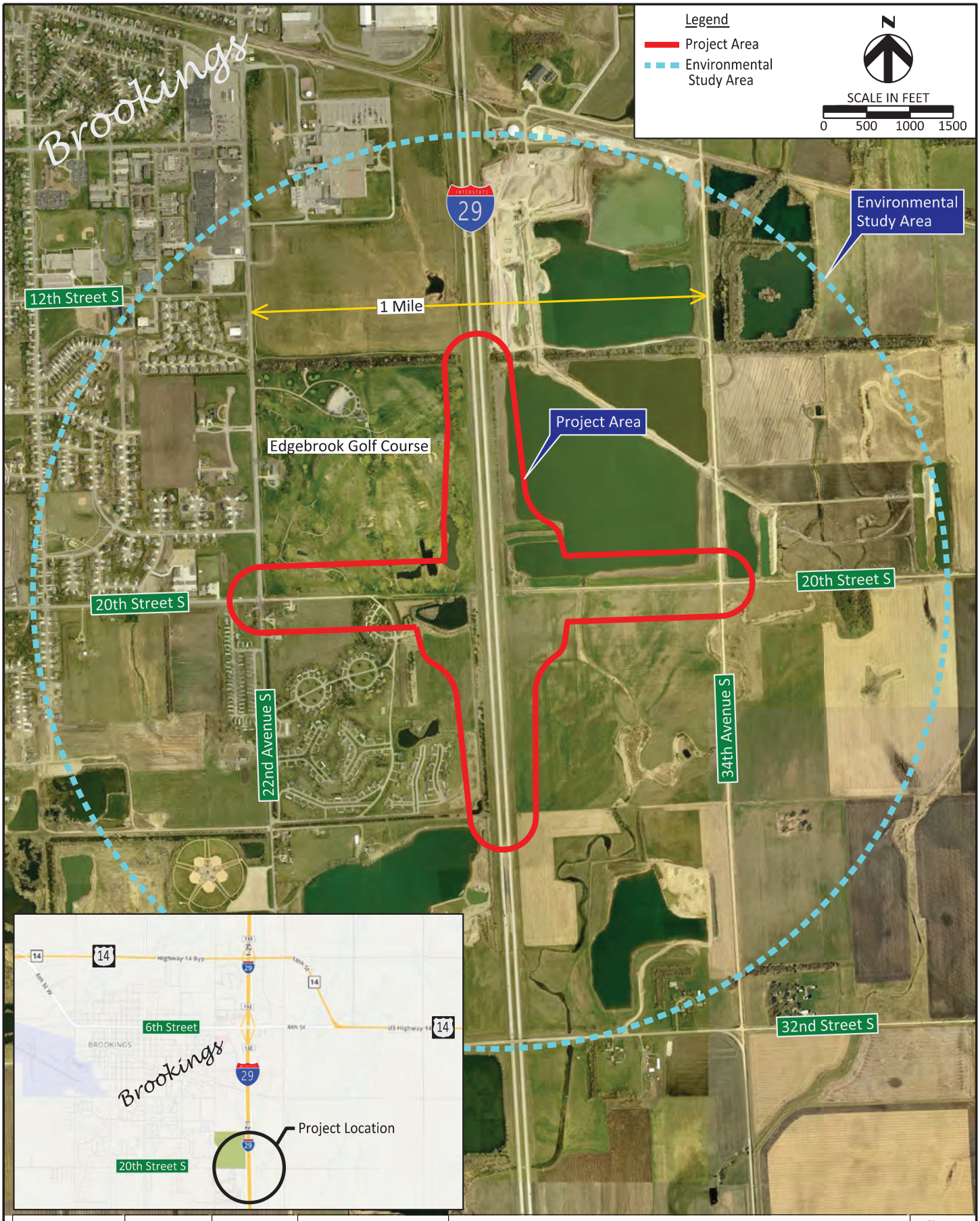
Preliminary alternatives were identified during the previously completed studies. Currently, these alternatives are being refined and the resources within the study area are being identified. Initially, the recreational resources identified include the Edgebrook Golf Course and a recreational multi-use trail. We would appreciate your department's confirmation that these are the only recreational resources present under your jurisdiction. In addition, we request any documentation available regarding the grant funds received through the Land and Water Conservation Fund program for either resource.

As the project proceeds, we will continue to coordinate with your department as information becomes available on any effects to any recreational resources. If you have any comments or questions, please feel free to contact me or provide comments to beckyb@bannerassociates.com.

Sincerely,

Becky Baker
Environmental Department Head
605.690.2190

Attachments



Drawn By: B.Miller
Date: 3/25/2020
Chked By: J.Unruh
Date: 3/25/2020
Revision:

Project Location and Study Area

I-29 Exit 130 (20th Street S) Interchange
Environmental Study - PCN 020V
Brookings, SD

Figure 1

Banner Associates, Inc.
2307 W 57th St, Ste 102
Sioux Falls, SD 57108
Tel 605.692.6342
Toll Free 855.323.6342
www.bannerassociates.com

April 27, 2020

Steve Naylor,
US Army Corp of Engineers- SD Regulatory Office
28563 Powerhouse Road
Pierre, SD 57501-5408

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Mr. Naylor:

This letter is to introduce the above-mentioned project and to initiate coordination with your office. The City of Brookings, South Dakota Department of Transportation (SDDOT), and Federal Highway Administration (FHWA) have initiated this project to study alternatives and identify the preferred alternative for a new interchange on Interstate 29 (I-29) at 20th Street South within Brookings, SD. Attached is a map showing the location of the above project. The project will comply with all federal and state regulations.

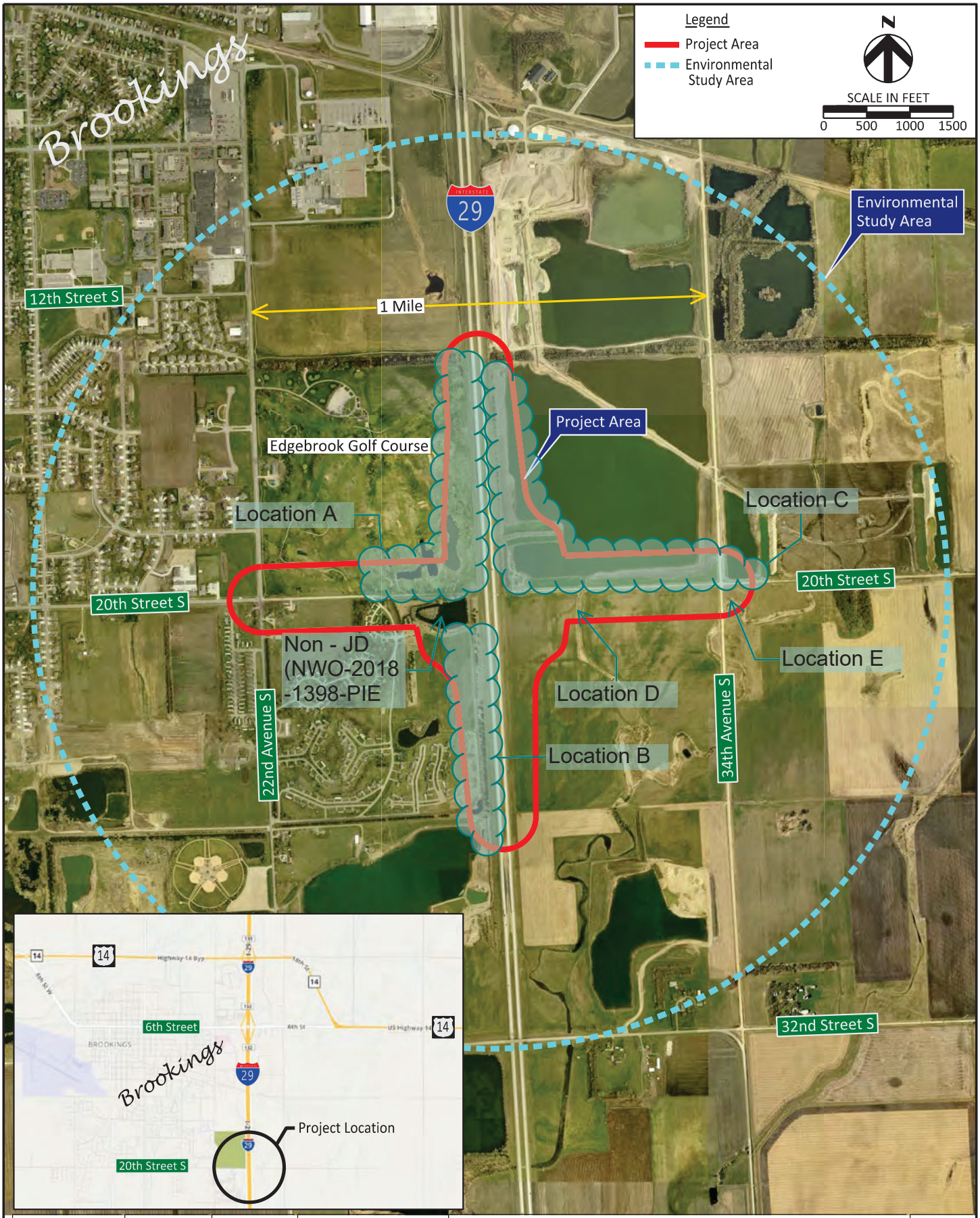
Preliminary alternatives were identified during the previously completed studies. Currently the alternatives are being refined and the resources within the study area are being identified. A wetland delineation will be completed for the project area noted in the attached figure. We were provided a jurisdictional determination from the landowner that USACE assigned the file number: NWO-2018-1398-PIE. We would like to request a jurisdictional determination for other areas noted in the attached figure (Locations A – E) that are assumed to contain wetland. As the project progresses, we will delineate the regulated wetland boundaries and complete an alternative analysis in compliance with the Clean Water Act.

To ensure continuous coordination, we would like to request a pre-consultation meeting to discuss the project. Due to the recent COVID outbreak, this meeting would be held as a video conference call with the project consultants, HDR and Banner Associates. Please provide dates and times that would be the preference of your office. If you have any comments or questions, please feel free to contact me or provide comments to beckyb@bannerassociates.com.

Sincerely,

Becky Baker
Environmental Department Head
605.690.2190

Attachments



Drawn By: B.Miller
Date: 3/25/2020
Chked By: J.Unruh
Date: 3/25/2020
Revision:

Project Location and Study Area

I-29 Exit 130 (20th Street S) Interchange
Environmental Study - PCN 020V
Brookings, SD

Figure 1

REQUEST FOR CORPS JURISDICTIONAL DETERMINATION (JD)

U.S. ARMY CORPS OF ENGINEERS, OMAHA DISTRICT

The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the project area subject to federal jurisdiction under the regulatory authorities referenced below. **Note**: Submission of requested information is voluntary; however, if information is not provided, the request for an AJD cannot be evaluated nor can an AJD be issued.

CORPS USE ONLY:
DATE RECEIVED:
PROJECT NO.:

1. PROPERTY LOCATION:

Street Address:
City/Township/Parish:
County: Brookings State: SD
Acreage of Parcel/Review Area for JD:
Section: 6 / 31 Township: 109 / 110N Range: 49W
Latitude: 44.282305° Longitude: -96.758393°
(For linear projects, please include the center point of the proposed alignment.)

2. REQUESTOR CONTACT INFORMATION:

Typed or printed name: Joanne Hight
Company name: SDDOT
Street Address: 700 E Broadway Ave
City: Pierre State: SD Zip: 57501
Daytime phone no.: (605) 773-3721
Email address: Joanne.Hight@state.sd.us

3. MAP: Please attach a survey/plat map and vicinity map identifying location and review area for the JD.

see Project Area attached and @ https://www.20thstinterchange.com/documents/ProjectLocation_Apr2020.pdf

4. REASON FOR REQUEST (check as many as applicable):

- [x] I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps, and the JD would be used to avoid and minimize impacts to jurisdictional aquatic resources and as an initial step in a future permitting process.
- [ ] I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps; this request is accompanied by my permit application and the JD is to be used in the permitting process.
- [ ] I intend to construct/develop a project or perform activities in a navigable water of the U.S. which is included on the district Section 10 list and/or is subject to the ebb and flow of the tide.
- [ ] A Corps JD is required in order to obtain my local/state authorization.
- [ ] I intend to contest jurisdiction over a particular aquatic resource and request the Corps confirm that jurisdiction does/does not exist over the aquatic resource on the parcel.
- [ ] I believe that the site may be comprised entirely of dry land/upland.
- [ ] Other:

5. TYPE OF DETERMINATION BEING REQUESTED:

- [x] I am requesting an approved JD
- [ ] I am requesting a preliminary JD
- [ ] I am requesting a "no permit required" letter as I believe my proposed activity is not regulated.
- [ ] I am unclear as to which JD I would like to request and require additional information.

6. OWNERSHIP DETAILS:

- [ ] I currently own this property.
- [ ] I plan to purchase this property.
- [ ] I am an agent/consultant acting on behalf of the requestor.
- [x] Other (please explain):

potential future ROW for interchange and approach

*__Authorities__: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332. **Uses**: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in the approved jurisdictional determination (AJD), which will be made available to the public on the District's website and on the Headquarters USACE website.

By signing below, you are indicating that you have the authority, or are acting as the duly authorized agent of a person or entity with such authority, to and do hereby grant Corps personnel right of entry to legally access the site if needed to perform the JD. Your signature shall be an affirmation that you possess the requisite property rights to request a JD on the subject property.

Signature: Joanne Hight Digitally signed by Joanne Hight Date: 2020.04.24 08:36:03 -05'00'

Date:

Department of Transportation
Environmental Office
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
605/773-4336

March 25, 2020

Jonathan Windy Boy, THPO
Chippewa Cree Tribe
PO Box 230
Box Elder, MT 59521

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Mr. Windy Boy:

Attached is a map showing the location of the above project. This project will study alternatives for a new interchange on Interstate 29 (I-29) at 20th Street South (20th St S). The project will comply with all federal and state environmental regulations.

Pursuant to Section 106 of the National Historic Preservation Act (36 CFR Part 800), the South Dakota Department of Transportation, on behalf of the Federal Highway Administration – SD Division, is soliciting comments on this project from tribes that have expressed an interest in highway projects in Brookings County. Please provide your comments by May 25, 2020 so the project can move toward a timely letting and construction (scheduled to begin in late 2021 or early 2022).

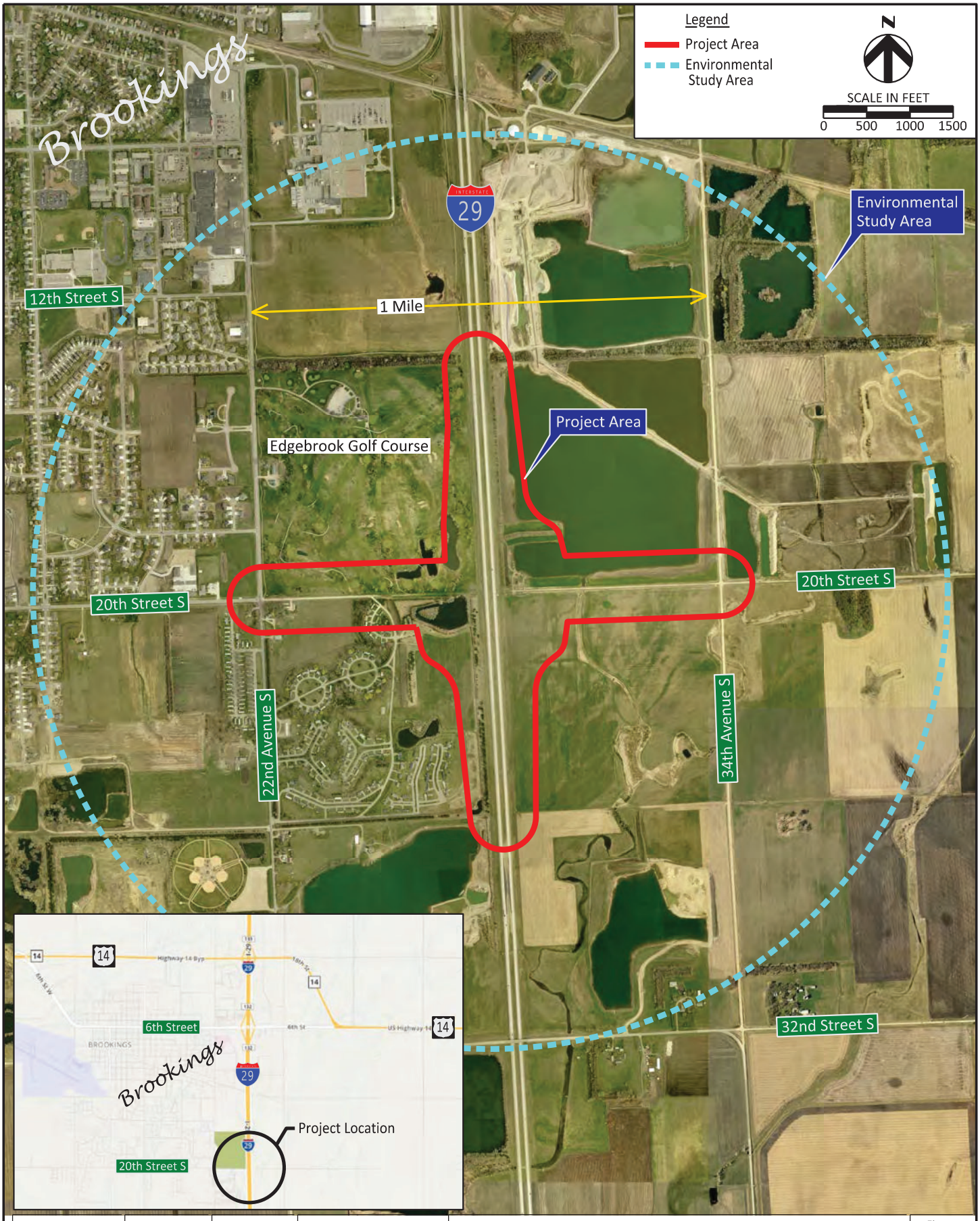
If you have any questions, please feel free to contact me at the phone number or email address below, or you may contact Tom Lehmkuhl, FHWA Environmental Engineer, at (605) 224-8033.

Sincerely,

Joanne M. Hight

Joanne Hight
Environmental Engineer Manager
605.773.3721
joanne.hight@state.sd.us

Attachment



Drawn By: B.Miller
Date: 3/25/2020
Chked By: J.Unruh
Date: 3/25/2020
Revision:

Project Location and Study Area

I-29 Exit 130 (20th Street S) Interchange
Environmental Study - PCN 020V
Brookings, SD

Figure 1

Department of Transportation
Environmental Office
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
605/773-4336

March 25, 2020

Garrie Killsahundred, THPO
Flandreau Santee Sioux Tribe
PO Box 283
Flandreau, SD 57028-0283

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Mr. Killshundred:

Attached is a map showing the location of the above project. This project will study alternatives for a new interchange on Interstate 29 (I-29) at 20th Street South (20th St S). The project will comply with all federal and state environmental regulations.

Pursuant to Section 106 of the National Historic Preservation Act (36 CFR Part 800), the South Dakota Department of Transportation, on behalf of the Federal Highway Administration – SD Division, is soliciting comments on this project from tribes that have expressed an interest in highway projects in Brookings County. Please provide your comments by May 25, 2020 so the project can move toward a timely letting and construction (scheduled to begin in late 2021 or early 2022).

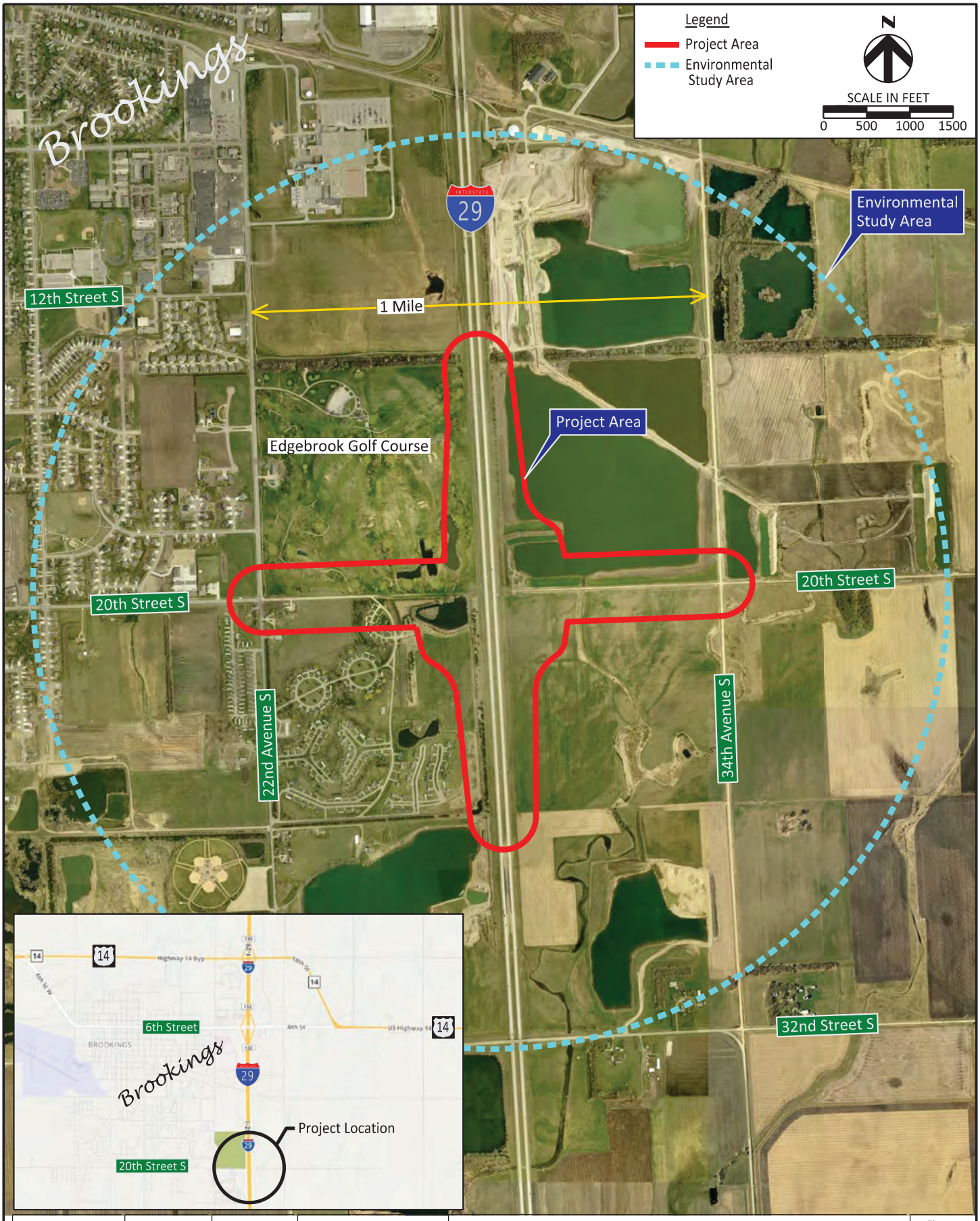
If you have any questions, please feel free to contact me at the phone number or email address below, or you may contact Tom Lehmkuhl, FHWA Environmental Engineer, at (605) 224-8033.

Sincerely,

Joanne M. Hight

Joanne Hight
Environmental Engineer Manager
605.773.3721
joanne.hight@state.sd.us

Attachment



Drawn By: B.Miller
Date: 3/25/2020
Chked By: J.Unruh
Date: 3/25/2020
Revision:

Project Location and Study Area

I-29 Exit 130 (20th Street S) Interchange
Environmental Study - PCN 020V
Brookings, SD

Figure 1

Department of Transportation
Environmental Office
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
605/773-4336

March 25, 2020

Clair Green, Section 106 Coordinator
Lower Brule Sioux Tribe
PO Box 187
Lower Brule, SD 57548-0187

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Ms. Green:

Attached is a map showing the location of the above project. This project will study alternatives for a new interchange on Interstate 29 (I-29) at 20th Street South (20th St S). The project will comply with all federal and state environmental regulations.

Pursuant to Section 106 of the National Historic Preservation Act (36 CFR Part 800), the South Dakota Department of Transportation, on behalf of the Federal Highway Administration – SD Division, is soliciting comments on this project from tribes that have expressed an interest in highway projects in Brookings County. Please provide your comments by May 25, 2020 so the project can move toward a timely letting and construction (scheduled to begin in late 2021 or early 2022).

If you have any questions, please feel free to contact me at the phone number or email address below, or you may contact Tom Lehmkuhl, FHWA Environmental Engineer, at (605) 224-8033.

Sincerely,

Joanne M. Hight

Joanne Hight
Environmental Engineer Manager
605.773.3721
joanne.hight@state.sd.us

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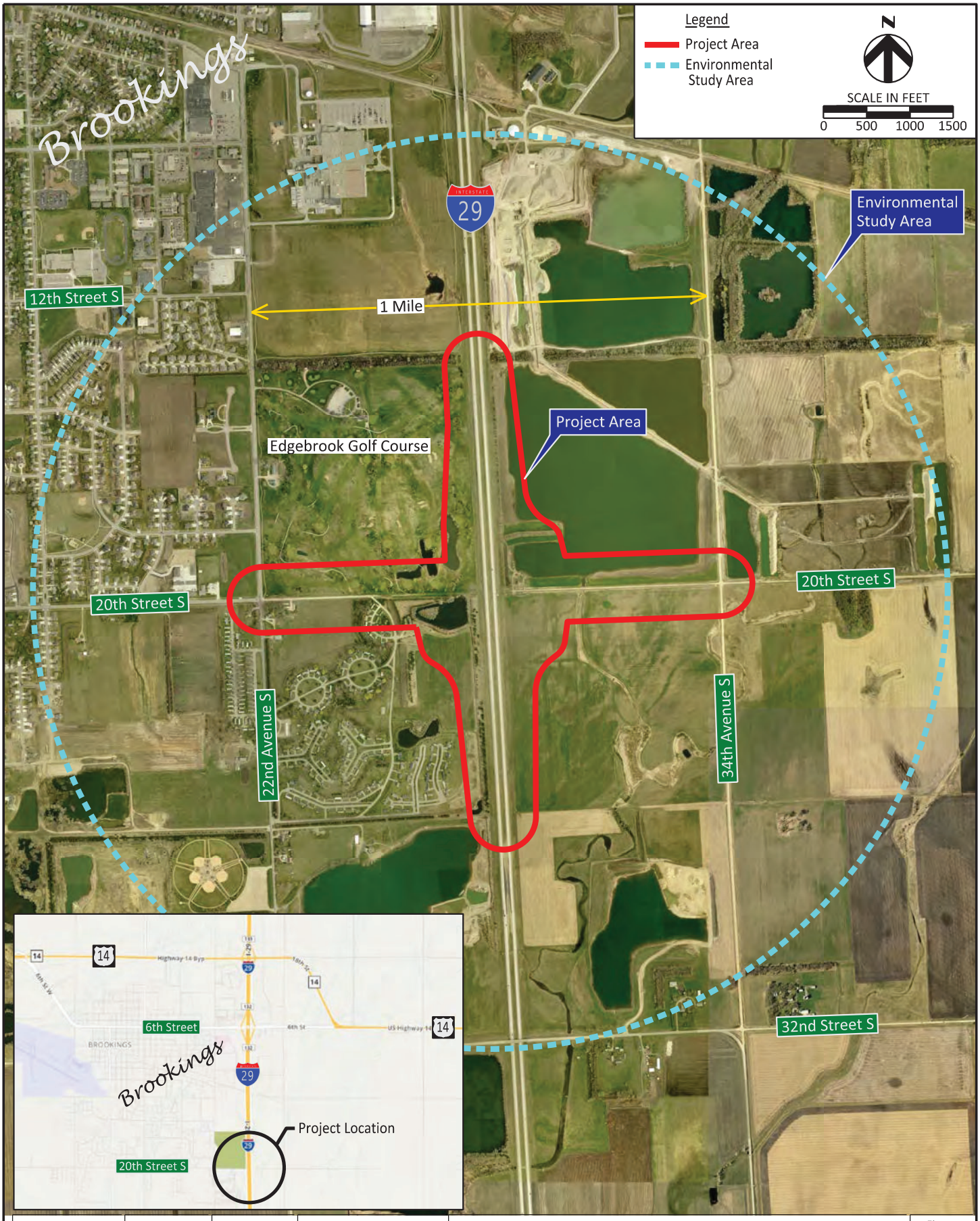


Drawn By: B.Miller
Date: 3/25/2020
Chked By: J.Unruh
Date: 3/25/2020
Revision:

Project Location and Study Area

I-29 Exit 130 (20th Street S) Interchange
Environmental Study - PCN 020V
Brookings, SD

Figure 1

Department of Transportation
Environmental Office
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
605/773-4336

March 25, 2020

Dianne Desrosiers, THPO
Sisseton-Wahpeton Oyate
PO Box 907
Agency Village, SD 57262-0907

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Ms. Desrosiers:

Attached is a map showing the location of the above project. This project will study alternatives for a new interchange on Interstate 29 (I-29) at 20th Street South (20th St S). The project will comply with all federal and state environmental regulations.

Pursuant to Section 106 of the National Historic Preservation Act (36 CFR Part 800), the South Dakota Department of Transportation, on behalf of the Federal Highway Administration – SD Division, is soliciting comments on this project from tribes that have expressed an interest in highway projects in Brookings County. Please provide your comments by May 25, 2020 so the project can move toward a timely letting and construction (scheduled to begin in late 2021 or early 2022).

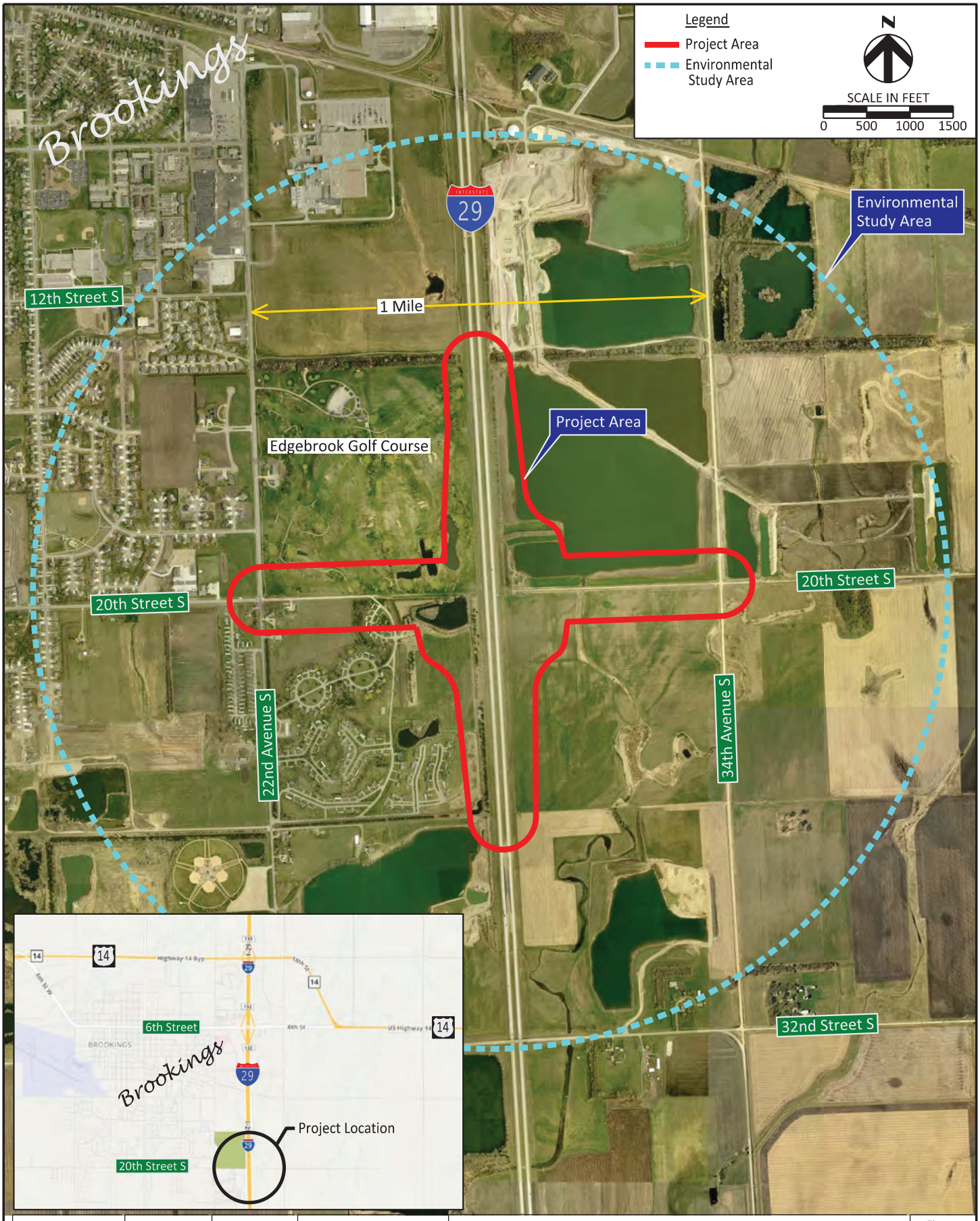
If you have any questions, please feel free to contact me at the phone number or email address below, or you may contact Tom Lehmkuhl, FHWA Environmental Engineer, at (605) 224-8033.

Sincerely,

Joanne M. Hight

Joanne Hight
Environmental Engineer Manager
605.773.3721
joanne.hight@state.sd.us

Attachment



Drawn By: B.Miller
Date: 3/25/2020
Chked By: J.Unruh
Date: 3/25/2020
Revision:

Project Location and Study Area

I-29 Exit 130 (20th Street S) Interchange
Environmental Study - PCN 020V
Brookings, SD

Figure 1

Department of Transportation
Environmental Office
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
605/773-4336

March 25, 2020

Jon Eagle, THPO
Standing Rock Sioux Tribe
PO Box D
Ft Yates, ND 58538-0522

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Mr. Eagle:

Attached is a map showing the location of the above project. This project will study alternatives for a new interchange on Interstate 29 (I-29) at 20th Street South (20th St S). The project will comply with all federal and state environmental regulations.

Pursuant to Section 106 of the National Historic Preservation Act (36 CFR Part 800), the South Dakota Department of Transportation, on behalf of the Federal Highway Administration – SD Division, is soliciting comments on this project from tribes that have expressed an interest in highway projects in Brookings County. Please provide your comments by May 25, 2020 so the project can move toward a timely letting and construction (scheduled to begin in late 2021 or early 2022).

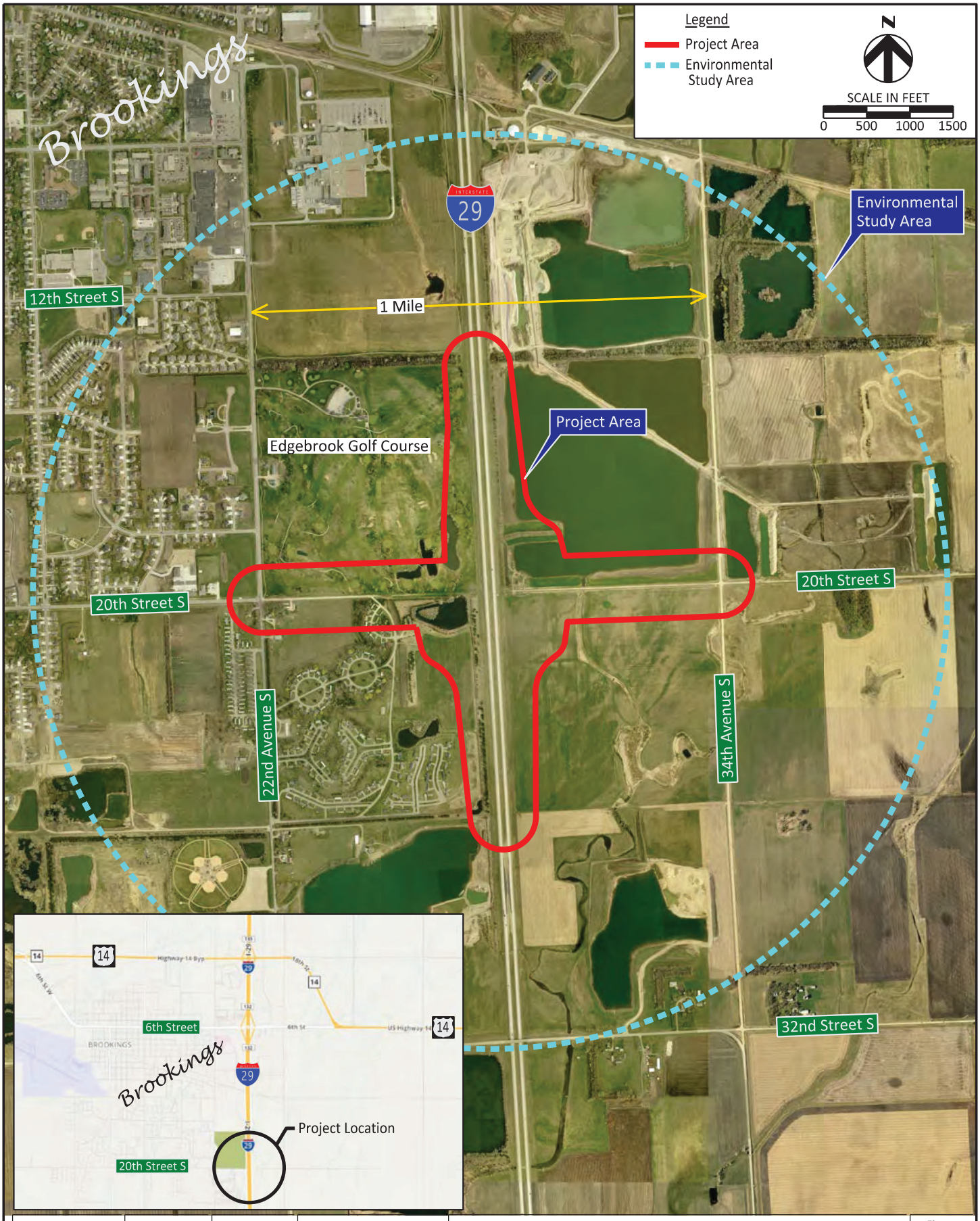
If you have any questions, please feel free to contact me at the phone number or email address below, or you may contact Tom Lehmkuhl, FHWA Environmental Engineer, at (605) 224-8033.

Sincerely,

Joanne M. Hight

Joanne Hight
Environmental Engineer Manager
605.773.3721
joanne.hight@state.sd.us

Attachment



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I-29 Exit 130 (20th Street S) Interchange
Environmental Study - PCN 020V
Brookings, SD

Figure 1

Department of Transportation
Environmental Office
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
605/773-4336

March 25, 2020

Pete Coffey
Tribal Historic Preservation Office
Three Affiliated Tribes
404 Frontage Rd.
New Town, ND 58763-9404

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Mr. Coffey:

Attached is a map showing the location of the above project. This project will study alternatives for a new interchange on Interstate 29 (I-29) at 20th Street South (20th St S). The project will comply with all federal and state environmental regulations.

Pursuant to Section 106 of the National Historic Preservation Act (36 CFR Part 800), the South Dakota Department of Transportation, on behalf of the Federal Highway Administration – SD Division, is soliciting comments on this project from tribes that have expressed an interest in highway projects in Brookings County. Please provide your comments by May 25, 2020 so the project can move toward a timely letting and construction (scheduled to begin in late 2021 or early 2022).

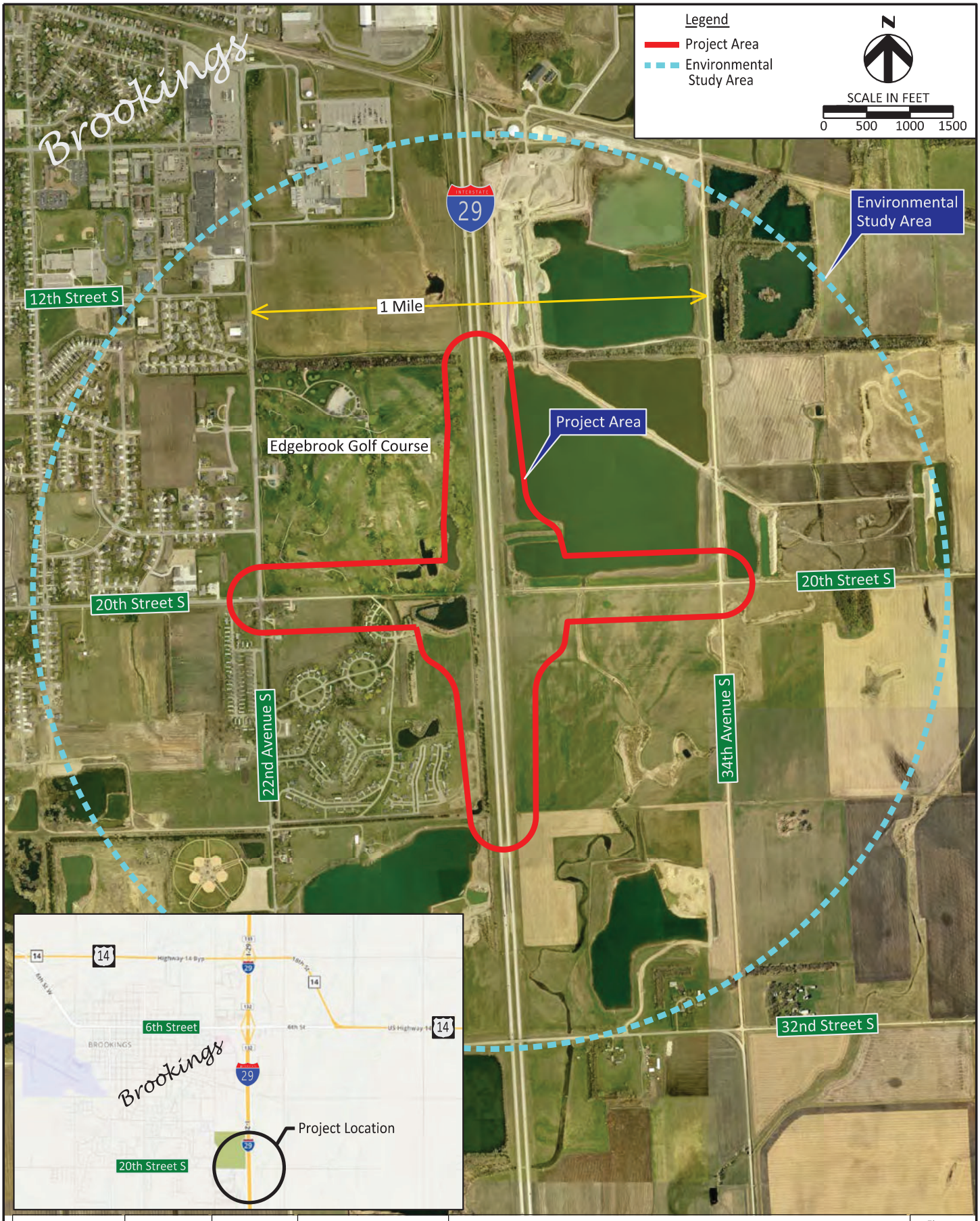
If you have any questions, please feel free to contact me at the phone number or email address below, or you may contact Tom Lehmkuhl, FHWA Environmental Engineer, at (605) 224-8033.

Sincerely,

Joanne M. Hight

Joanne Hight
Environmental Engineer Manager
605.773.3721
joanne.hight@state.sd.us

Attachment



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Date: 3/25/2020
Chked By: J.Unruh
Date: 3/25/2020
Revision:

Project Location and Study Area

I-29 Exit 130 (20th Street S) Interchange
Environmental Study - PCN 020V
Brookings, SD

Figure 1

Department of Transportation
Environmental Office
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
605/773-4336

March 25, 2020

Kip Spotted Eagle, THPO
Yankton Sioux Tribe
PO Box 1153
Wagner, SD 57380-1153

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Mr. Spotted Eagle:

Attached is a map showing the location of the above project. This project will study alternatives for a new interchange on Interstate 29 (I-29) at 20th Street South (20th St S). The project will comply with all federal and state environmental regulations.

Pursuant to Section 106 of the National Historic Preservation Act (36 CFR Part 800), the South Dakota Department of Transportation, on behalf of the Federal Highway Administration – SD Division, is soliciting comments on this project from tribes that have expressed an interest in highway projects in Brookings County. Please provide your comments by May 25, 2020 so the project can move toward a timely letting and construction (scheduled to begin in late 2021 or early 2022).

If you have any questions, please feel free to contact me at the phone number or email address below, or you may contact Tom Lehmkuhl, FHWA Environmental Engineer, at (605) 224-8033.

Sincerely,

Joanne M. Hight

Joanne Hight
Environmental Engineer Manager
605.773.3721
joanne.hight@state.sd.us

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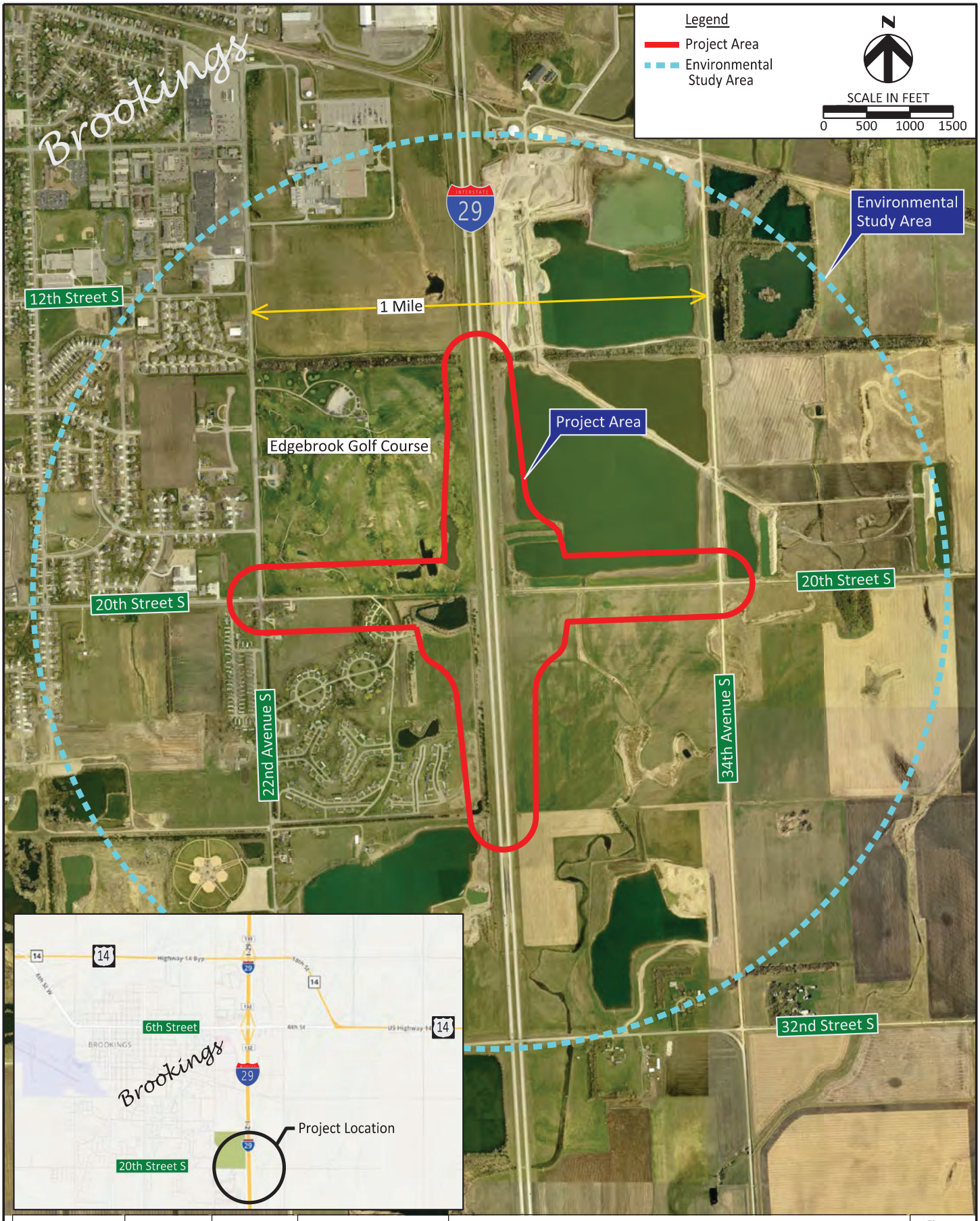


Drawn By: B.Miller
Date: 3/25/2020
Chked By: J.Unruh
Date: 3/25/2020
Revision:

Project Location and Study Area

I-29 Exit 130 (20th Street S) Interchange
Environmental Study - PCN 020V
Brookings, SD

Figure 1

DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

April 7, 2020

Joanne Hight
Department of Transportation
700 East Broadway Avenue
Pierre, South Dakota 57501

RE: SD DOT Project
EM 0295(45)130
PCN 020V
Brookings County

Dear Ms. Hight:

The South Dakota Department of Environment and Natural Resources (DENR), Division of Environmental Regulation, has reviewed the above referenced project.

This office has no objections to this project, which should not result in any violations of applicable statutes or regulations provided the Department of Transportation and/or its contractor(s) comply with the following requirements.

SURFACE WATER QUALITY

1. All fill material shall be free of substances in quantities, concentrations, or combinations which are toxic to aquatic life.

2. Removal of vegetation shall be confined to those areas absolutely necessary to construction.

3. At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site. Any construction activity that disturbs an area of one or more acres of land must have authorization under the General Permit for Storm Water Discharges Associated with Construction Activities. Contact the Department of Environment and Natural Resources for additional information or guidance at 1-800-SDSTORM (800-737-8676) or http://denr.sd.gov/des/sw/stormwater.aspx.

4. All material identified in the application as removed waste material, material stockpiles, dredged or excavated material shall be placed for either temporary or permanent disposal in an upland site that is not a wetland, and measures taken to ensure that the material cannot enter the watercourse through erosion or any other means.

5. Methods shall be implemented to minimize the spillage of petroleum, oils and lubricants used in vehicles during construction activities. If a discharge does occur, suitable containment procedures such as banking or diking shall be used to prevent entry of these materials into a waterway.

6. All newly created and disturbed area above the ordinary high-water mark which are not riprapped shall be seeded or otherwise revegetated to protect against erosion.

7. This project may be in the vicinity of multiple streams and wetlands. These waters are considered waters of the state and are protected under Administrative Rules of South Dakota Chapter 74:51. Special construction measures may have to be taken to ensure that water quality standards are not violated.

HAZARDOUS and SOLID WASTES

1. Should any hazardous waste be generated during the implementation of this project, the generator must abide by all applicable hazardous waste regulations found in ARSD 74:28 and 40 CFR Part 262.

2. If any contamination is encountered during construction activities, the contractor, owner, or party responsible for the release must report the contamination to the department at 605-773-3296. Any contaminated soil encountered must be temporarily stockpiled and sampled to determine disposal requirements.

3. It is not expected that any hazardous wastes sites will be encountered during road construction in any rural area. However, if road construction is planned for areas within a city or town, the DOT or contractor should contact this Department prior to construction.

4. Some solid waste may be generated during this project. Any solid waste generated that will not be reused in some beneficial manner must be disposed or managed at a permitted solid waste facility.

5. Regional landfills able to accept all solid waste generated are listed on our website available here: https://apps.sd.gov/NR60SolidWaste/main.html#. Only Regional landfills are permitted to accept all wastes generated. If you have any questions please contact Waste Management at 605-773-3153.

6. Demolition or renovation of a building structure may be subject to asbestos abatement requirements. If demolition is part of the construction projects please contact our Asbestos Coordinator at 605-773-3153.

AIR QUALITY

1. It appears that Department of Transportation projects may have only a minor impact on the air quality in South Dakota. This impact would be through point source and fugitive emissions.

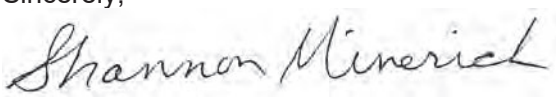
2. Equipment with point source emissions in many cases are required to have an air quality permit to operate. Permit applications can be obtained from the Air Quality or Minerals and Mining Programs.

3. Fugitive emissions, although not covered under State air quality regulations, are a common source of public concern and may be subject to local or county ordinances. Fugitive emissions add to the deterioration of the ambient air quality and should be controlled to protect the health of communities within the construction areas.

4. For further air quality information, please contact Anthony Lueck, Air Quality Program, telephone number 605-773-3151.

This office requests the opportunity to review and comment on any significant changes that may be proposed before the project is completed. Thank you for the opportunity to comment on the proposed project. If you have any questions, please contact me at Shannon.Minerich@state.sd.us.

Sincerely,



Shannon Minerich
Environmental Scientist
Surface Water Quality Program

Cc: Becky Baker, Banner & Associates

DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov

April 02, 2020

Joanne Hight
South Dakota Department of Transportation
700 E Broadway
Pierre, SD 57501

Re: Environmental Review – Project EM 0295(45) 130, PCN 020V, I-29 Exit 130, Brookings County, SD, I-29 Exit 130 (20th Street South) Interchange. Interchange Justification Study, Environmental Study, Right of Way & Design.

Dear Ms. Hight:

The South Dakota Department of Environment and Natural Resources' (DENR) Ground Water Quality Program has reviewed the above-referenced project for potential impacts to ground water quality. Based on the information submitted in your letter, dated March 25, 2020, DENR does not anticipate adverse impacts to ground water quality by this project.

If construction for this project disturbs one or more acre(s) of soil, a storm water permit may be required. For more information or to obtain a storm water permit, please contact the Department at 1-800-SD-Storm or visit: http://denr.sd.gov/des/sw/StormWaterandConstruction.aspx.

Additionally, if construction for this project disturbs a major stream or surface water body please make sure you contacted the DENR's Surface Water Quality Program and the United States Army Corps of Engineers. DENR's Surface Water Quality Program can be reached at (605) 773-3351.

There have been numerous petroleum and other chemical releases throughout the state. Of the releases reported to DENR, we have not identified any release cases in the vicinity of your project. However, the locational information provided to us regarding releases is sometimes inaccurate or incomplete. If you would like to do more research, additional information on reported releases in South Dakota may be obtained at the following website: https://apps.sd.gov/denr/spillsviewer/

In the event that contamination is encountered during construction activities or is caused by the construction activity, South Dakota Department of Transportation, or its designated representative,

must report the contamination to DENR at 605-773-3296. Any contaminated soil encountered or caused by the construction must be temporarily stockpiled and sampled to determine disposal requirements.

Thank you for providing DENR the opportunity to comment on this project. If you have any questions regarding the information provided, please contact me at 605-773-3296.

Sincerely,

Andrew Fox
Environmental Scientist I
Ground Water Quality Program

Enclosure

c: Robert Hill, Brookings County Emergency Manager, Brookings, SD

Becky Baker

From: Clair Green <clairgreenoffice@gmail.com>
Sent: Thursday, March 26, 2020 8:43 AM
To: Becky Baker
Subject: Re: PCN 020V- I-29 Exit 130 (20th Street South) Interchange

the Lower Brule Tribe has no comment

On Thu, Mar 26, 2020 at 7:27 AM Becky Baker <beckyb@bannerassociates.com> wrote:

> Ms. Green,
>
> Please see the attached letter. Pursuant to Section 106 of the National Historic Preservation Act (36 CFR Part 800), the South Dakota Department of Transportation, on behalf of the Federal Highway Administration – SD Division, is soliciting comments on this project from tribes that have expressed an interest in highway projects in Brookings County. Please provide your comments by May 25, 2020 so the project can move toward a timely letting and construction (scheduled to begin in late 2021 or early 2022).
>
> Thanks!
>
> Becky Baker | Environmental Department Head
>
> BANNER
> engineering a better community
>
> Banner Associates, Inc.
>
> 2307 West 57th Street, Suite 102
>
> Sioux Falls, South Dakota 57108
>
> Toll Free | 1.855.323.6342
>
> www.bannerassociates.com

Becky Baker

From: Kittle, Randy <Randy.Kittle@state.sd.us>
Sent: Thursday, March 26, 2020 8:31 AM
To: Becky Baker; Morey, Hilary
Cc: Hight, Joanne
Subject: RE: PCN 020V- I-29 Exit 130 (20th Street South) Interchange

Becky,

Thank you for the opportunity to comment on project PCN 020V – I-29 Exit 130 (20th Street South) Interchange with regard to Land & Water Conservation Fund (LWCF) Section 6(F)(3) encumbrances. The City of Brookings has been the recipient of multiple LWCF grants throughout the life of the program, some of which have been used at Edgebrook Golf Course. The Edgebrook Golf Course is encumbered under LWCF Section 6(F)(3) for public outdoor recreation.

If a portion of the golf course property needs to be converted from public outdoor recreation use, a Conversion of Use will need to be processed for that property.

Feel free to contact me if you have additional questions regarding this site. We are currently working remotely so I do not have easy access to all of the old project files.

Randy Kittle | *Grants Coordinator*
South Dakota Game, Fish and Parks
523 East Capitol Avenue | Pierre, SD 57501
605.773.5490 | randy.kittle@state.sd.us

From: Becky Baker <beckyb@bannerassociates.com>
Sent: Thursday, March 26, 2020 8:23 AM
To: Morey, Hilary <Hilary.Morey@state.sd.us>; Kittle, Randy <Randy.Kittle@state.sd.us>
Cc: Hight, Joanne <Joanne.Hight@state.sd.us>
Subject: [EXT] PCN 020V- I-29 Exit 130 (20th Street South) Interchange

Good morning,

Please see the attached agency coordination letter requesting your input for the I-29 Exit 130 (20th Street South) Interchange.

Thanks!
Becky Baker | Environmental Department Head

BANNER
engineering a better community

Banner Associates, Inc.
2307 West 57th Street, Suite 102
Sioux Falls, South Dakota 57108

SOUTH DAKOTA DEPARTMENT OF
GAME, FISH AND PARKS
523 EAST CAPITOL AVENUE | PIERRE, SD 57501

April 24, 2020

Joanne Hight
SD Department of Transportation
700 E. Broadway Avenue
Pierre, SD 57501

RE: Project EM 0295(45) 130 PCN 020V Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange justification study, environmental study, right-of-way and design

Dear Joanne,

The Department of Game, Fish and Parks has reviewed the above project involving the study of a new interchange in Brookings, South Dakota.

We have conducted a search of the SD Natural Heritage Database for the above referenced project. This database monitors species at risk, specifically those species that are legally designated as threatened, endangered or rare. We did not find any occurrences of endangered, rare or threatened species in the immediate project area. Please note that many places in South Dakota have not been surveyed for rare and endangered species. Based on the information provided, there is no anticipated significant impact to fish and wildlife resources and would anticipate that to remain if the following suggestions are considered during the planning and construction of the project:

1. Disturbance to riparian and wetland areas should be kept to an absolute minimum.
2. If riparian vegetation is lost it should be quantified and replaced on site. Seeding of indigenous species should be accomplished immediately after construction to reduce sediment and erosion.
3. A site specific sediment and erosion control plan should be part of the project.
4. A post construction erosion control plan should be implemented in order to provide interim control prior to re-establishing permanent vegetative cover on the disturbed site.

If you have any questions, please feel free to contact me at 605-773-6208.

Sincerely,

Hilary Morey
Environmental Review Senior Biologist
523 East Capitol Avenue
Pierre, SD 57501
hilary.morey@state.sd.us

Becky Baker

From: Dusty Rodiek <DRodiek@cityofbrookings.org>
Sent: Monday, April 27, 2020 10:07 AM
To: Becky Baker
Subject: RE: I-29 (20th Street South) Interchange

Becky,
I received your letter and wanted to confirm that the trail and golf course are the only recreational amenities within the project area.
Attached are the Land and Water Conservation funded projects related to the golf course. (As far as I can tell)
I have not been able to locate the original project files for these. SDGFP Grants Division should have additional information based on the project numbers if you need it.
It appears that the original land purchase and initial course development was funded by LWCF.
Thank you and let me know if you need additional information.

Dusty Rodiek
Director of Parks, Rec. and Forestry
Office: 605.697.8332
Cell: 605.691.3313
drodiek@cityofbrookings.org

brookings
SOUTH DAKOTA

www.cityofbrookings.org

Project Title and Number:	BROOKINGS ACQU
Project Contact:	CITY OF BROOKIN
Address:	221 Main Avenue, Br
Project Location:	SE corner of city.
Project Fund Amount:	$25,750.00

Project Scope:
Acquire 150 acres for future development.

Project Title and Number:	BROOKINGS GOLF CO 4600166
Project Contact:	CITY OF BROOKINGS
Address:	221 Main Avenue, Brook
Project Location:	City golf course - SE of c
Project Fund Amount:	$100,613.22 Pro

Project Scope:
9-hole golf course including grass greens, irrigation sy
storage spaces, parking lot & tree planting.

From: Becky Baker <beckyb@bannerassociates.com>
Sent: Thursday, April 23, 2020 10:20 PM
To: Dusty Rodiek <DRodiek@cityofbrookings.org>
Cc: Jacqueline Lanning <JLanning@cityofbrookings.org>; Rust, Jill <jill.rust@hdrinc.com>
Subject: I-29 (20th Street South) Interchange

Dusty,

Please see the attached letter. HDR Engineering and Banner Associates have been hired to complete the environmental assessment for this project. Please feel free to let us know if you have any questions.

Thanks!

Becky Baker | Environmental Department Head

BANNER
engineering a better community

Banner Associates, Inc.
2307 West 57th Street, Suite 102
Sioux Falls, South Dakota 57108
Toll Free | 1.855.323.6342
www.bannerassociates.com

Department of Transportation
Environmental Office
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
605/773-4336

September 10, 2020

Randy Kittle
South Dakota Game, Fish, and Parks
Joe Foss Building, 523 East Capitol Avenue
Pierre, SD 57501

RE: **Section 6(f) Impact Considerations**
Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Mr. Kittle:

The City of Brookings, South Dakota Department of Transportation (SDDOT), and Federal Highway Administration (FHWA) have continued development of this project and identified the preferred alternative for a new interchange on Interstate 29 (I-29) at 20th Street South within Brookings, SD. Attached is a map showing the location of the above project (Figure 1).

Edgebrook Golf Course is a regulation public 18-hole facility with a nine-hole junior/short course located at 1415 22nd Avenue South. It is owned and operated by the City of Brookings. Fees are reviewed and set annually by Brookings Parks & Recreation Advisory Board and include single rounds of golf and seasonal passes. The clubhouse offers golf carts and equipment for rent as well as pro shop. Edgebrook also provides professional golf lessons by appointment. Three Land and Water Conservation Fund (LWCF) grants (46-00166, 46-00304, and 46-01035) were obtained to develop the Edgebrook golf course. Therefore, the entire golf course is protected under Section 6(f) for public outdoor recreation.

No permanent right-of-way is needed for the 20th Street construction and no operations of the golf course would be impacted. A temporary easement would be needed to complete the work along the south edge of the golf course near 20th Street. A total of 0.12 acres within the golf course property will be temporarily impacted and 0.28 acres of temporary easement would be required for construction (See Figure 2). The area will be re-graded and reseeded to a similar or better condition once construction of the area is complete.

Minimal grading would be needed along the south edge of the golf course for 20th Street construction as shown in attached Figure 1. The alignment of proposed 20th Street has been shifted to the south specifically to avoid impacts to the golf course. Near 22nd Avenue, the 20th Street fill slope would extend onto the City-owned golf course property as shown in the Section A-A view of Figure 1. This allows 20th Street to line up across 22nd Avenue. Construction within this area will take less than 6 months and no operations of the golf course will be impacted.

I am requesting your concurrence that the work being conducted will be considered a temporary non-conforming use 6(f) impact. If you concur, please indicate as such by providing your signature in the space provided below at your earliest convenience so the project's environmental documentation can be completed. Thank you for your time and cooperation on this matter. If you have questions and/or concerns, please feel free to contact me.

Sincerely,

Joanne M. Hight

Joanne Hight
Environmental Engineer Manager
605.773.3721

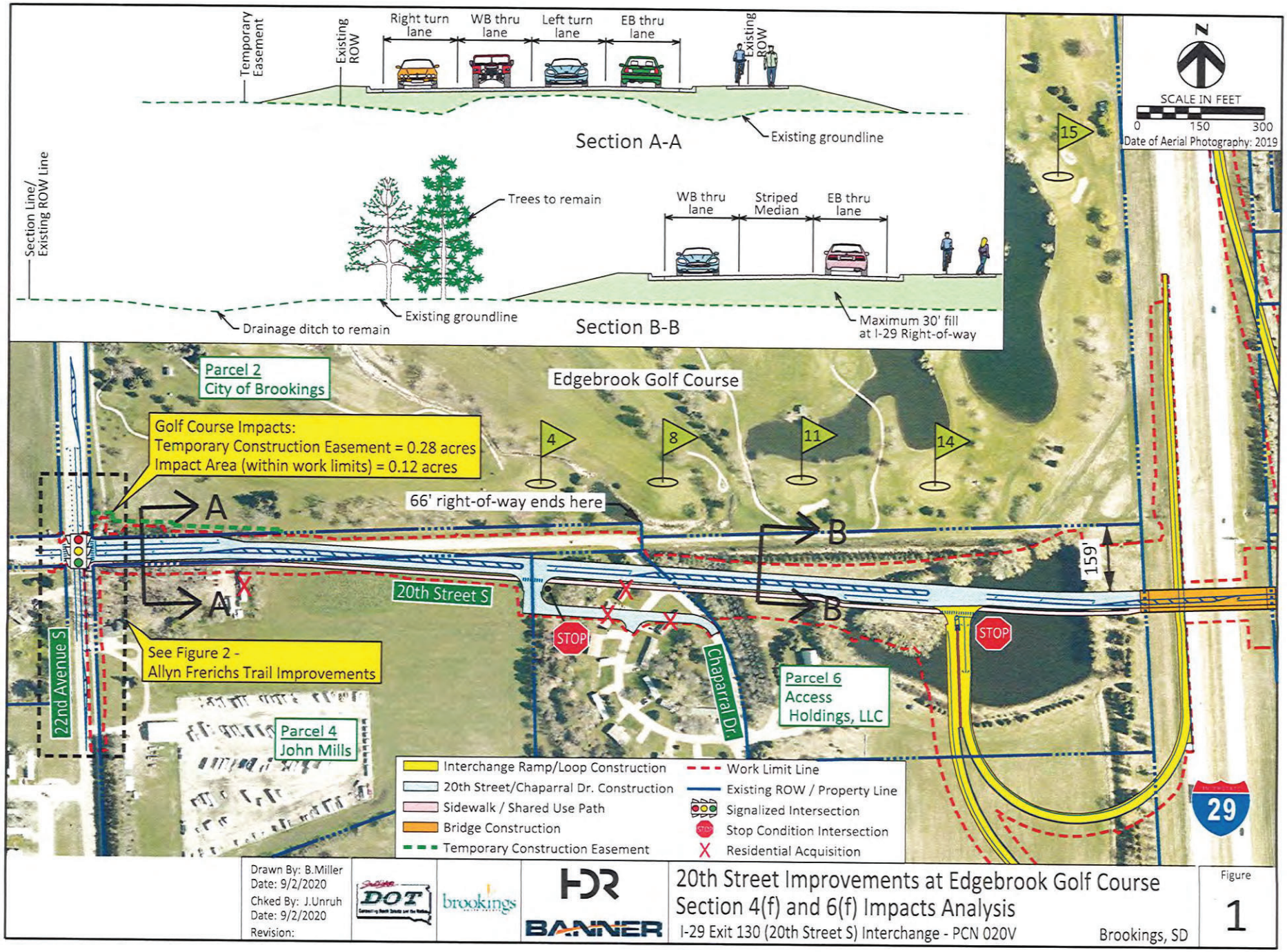
Attachment

Concurrence: As the designated alternate State Liason Officer who administers LWCF Program funds, I hereby concur that the use and impacts of the I-29 Exit 130 (20th Street South) Interchange project combined with identified avoidance, minimization, and mitigation measures, will not adversely affect the activities, features, and attributes that qualify Edgebrook Golf Course for protection under Section 6(f) and that the activities fall under a temporary, non-conforming use..

9/11/2020

Randy Kittle Date:

South Dakota Game, Fish, and Parks



Drawn By: B.Miller
Date: 9/2/2020
Chked By: J.Unruh
Date: 9/2/2020
Revision:

DOT

brookings

HDR

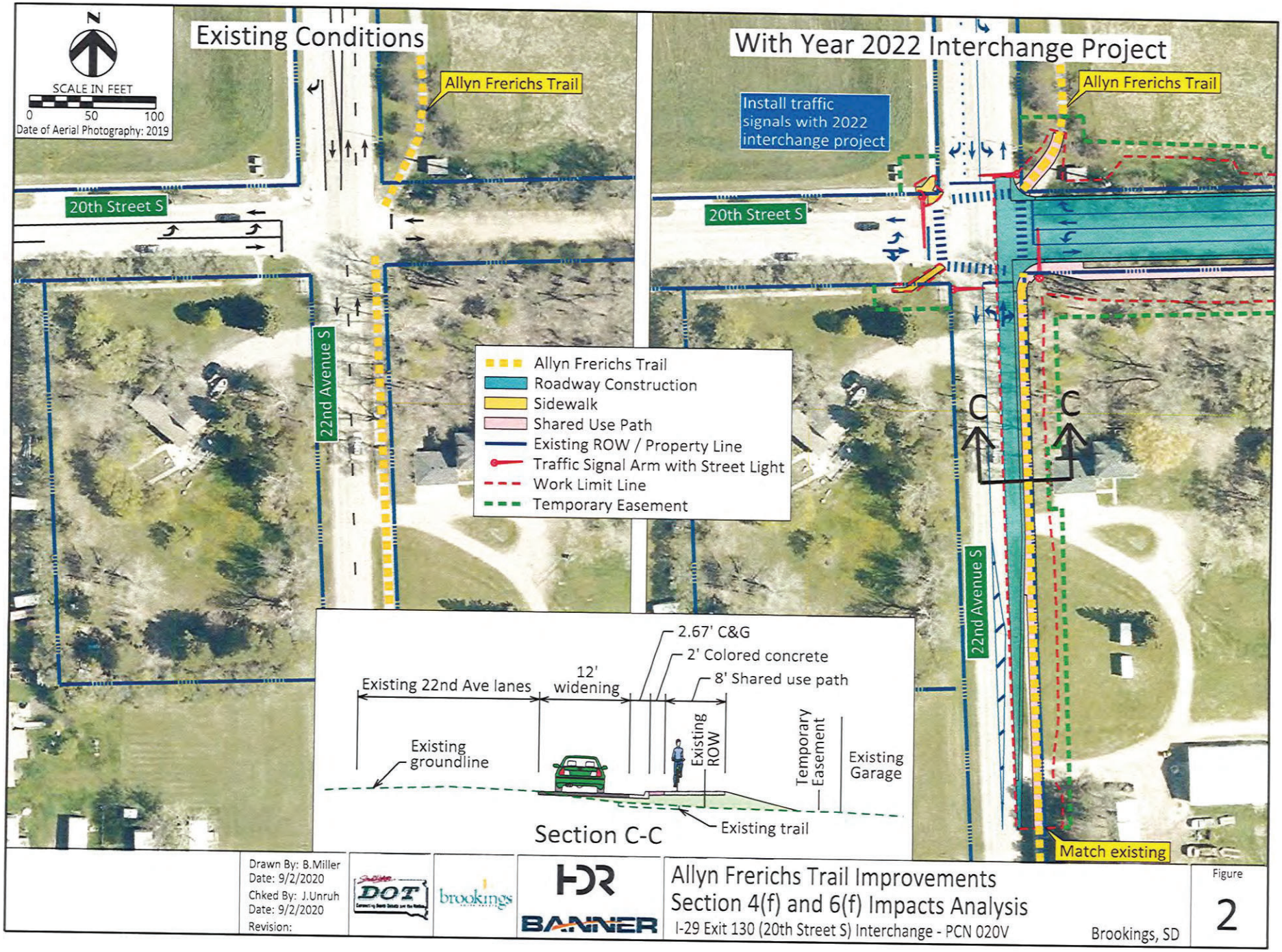
BANNER

20th Street Improvements at Edgebrook Golf Course
Section 4(f) and 6(f) Impacts Analysis

I-29 Exit 130 (20th Street S) Interchange - PCN 020V

Brookings, SD

Figure 1



Drawn By: B.Miller
Date: 9/2/2020
Chked By: J.Unruh
Date: 9/2/2020
Revision:

DOT | brookings | HDR | BANNER

Allyn Frerichs Trail Improvements
Section 4(f) and 6(f) Impacts Analysis

I-29 Exit 130 (20th Street S) Interchange - PCN 020V

Brookings, SD

Figure 2

Banner Associates, Inc.
2307 W 57th St, Ste 102
Sioux Falls, SD 57108
Tel 605.692.6342
Toll Free 855.323.6342
www.bannerassociates.com

MEETING MINUTES

DATE	June 10, 2020	
PROJECT	I-29 Exit 130 (Brookings) Interchange	BAI No.23192.00
SUBJECT	Floodplain Analysis	
LOCATION	Zoom Meeting	
ATTENDEES	Jackie Lanning, Brookings City Engineer	
	Robert Hill, Brookings County Floodplain Administrator	
	Richard Haugen, Brookings County	
	Staci Bungard, City of Brookings Floodplain Administrator	
	Tom Birney, Federal Emergency Management Agency (FEMA)	
	Tracie Harrison, FEMA	
	Kent Johnson, Banner Associates	
	Rich Uckert, Banner Associates	
	Becky Baker, Banner Associates	

1. INTRODUCTION OF THE PROJECT
    - A. BRIEF DISCUSSION OF PURPOSE AND NEED
    - B. OVERVIEW OF ALTERNATIVES
    - C. OVERVIEW OF PROJECT SCHEDULE

2. FLOODPLAIN ANALYSIS
    - A. DESIGNATED FLOODPLAIN
        - I. CURRENT
        - II. PROPOSED
    - B. DECISION TO BE MADE:
        - I. REGULATE TO EFFECTIVE FIRM USING 1D HEC-RAS MODEL IMPACT
        - II. REGULATE TO EFFECTIVE FIRM USING PROPOSED FEMA BLE (2D HEC-RAS MODEL)
        - III. REGULATE TO PROPOSED FEMA BLE
        - IV. FLOOPLAIN DEVELOPMENT PERMIT

DISCUSSION:

- A portion of the proposed interchange site is located within a FEMA "Zone A" Special Flood Hazard Area (SPFA) as identified on FEMA's *effective* Flood Insurance Rate Map (FIRM). The local communities (City and County) regulate using the effective map; however, CFR and local ordinances allow use of "best available information" which includes BLE data. Since the effective FEMA map is more restrictive than the BLE map, we are required to regulate to the effective map. If the BLE map was more restrictive (more inundation area than the effective map), we could use it and the elevations from the BLE information. The effective Zone A areas were not created through detailed engineering methods and do not have Base Flood Elevations (BFEs) tied to it.
- The future BLE mapping show the interchange site is not located within it's inundation area.
- The BLE information will be updated and eventually become the effective map in the future, unknown timeline due to COVID and funding. Best guess is two to four years when it will become effective.
- Current effective floodplain is Zone A, which allows up to 1 foot of rise. Zone A encroachment does not require modeling of impacts in the Floodplain Development Permit. Initial conservative 1D HEC-RAS modeling shows the alternatives for the project having a rise of 0.65 feet. To mitigate, the incorporation of a 50-foot-wide culvert would cause a rise of 0.50 feet.
- A Floodplain Development Permit is required because the project area is within a Zone A SFHA. A LOMR may or may not be required, coordination would occur with Floodplain Administrators to determine if required after completion of project. Definition of completion is not clear, likely during completion of construction. Timing of approval of new floodplain map may avoid the LOMR, the elevations could be provided to FEMA for incorporation in the new designated floodplain.
- A CLOMR is not required by FEMA for rise in a Zone A designated floodplain. A CLOMR could be requested by the community, but it is not likely for this area for a number of factors: it is in a Zone A SFHA, the impacted area is currently not developed, FEMA will be updating the map, and the conservative increase due to the project is less than 1-foot.
- A 50-foot-wide culvert is not required for mitigation and would cause concerns for drainage downstream. A culvert sized by drainage design standards should be incorporated at the drainage on the east side of the interstate. Brookings County would like their highway superintendent to review.

PREPARED BY Becky Baker and Kent Johnson

JUNE 11, 2020 - FURTHER CLARIFICATION FOLLOWING MEETING BETWEEN KENT JOHNSON AND TOM BIRNEY, FEMA REGION 8.

Following was noted by Kent Johnson. After yesterdays discussion with Tom Birney, he said that within a Zone A area, there is no defined allowable increase in floodwater. I think we generally "think" it is a 1-foot allowable because that is what is stated in the Zone AE and more restrictive regulations/ordinances and is stardard floodplain managment practice. The 1-foot increase is used in SDDOT design guidelines for sizing structures (culverts/bridges) as the max allowable.

The allowable increase is not defined within a Zone A because the boudary was determined from an approximate study without any BFEs being established.

Here's my drainage law comment and Tom B also mentioned this - A landowner impacted by increased flood heights due to the project could potentially file a complaint.

Banner Associates, Inc.
409 22nd Avenue South
Brookings, SD 57006
Tel 605.692.6342
Toll Free 855.323.6342
www.bannerassociates.com

MEETING MINUTES

DATE	06-23-2020	
PROJECT	I-29 EXIT 130 BROOKINGS INTERCHANGE- FLOODPLAIN	BAI No. **23192.00**
SUBJECT	ROAD DESIGN / DRAINAGE MANUAL DESIGN HEADWATER	
LOCATION	Remote Teams Meeting	
ATTENDEES	Bob Hill, Richard Haugen – Brookings County Planning and Zoning	
	Jackie Lanning, Staci Bungard, Thad Drietz – City of Brookings	
	Kent Johnson – Banner Associates, Inc.	

1. Discuss floodplain administrator duties for interchange project.
    a. Ordinances were reviewed very briefly which identify administrator duties for floodplain areas in the community. Need to determine impact of project within floodplain.
    b. Project is within a Zone A (approximate floodplain study without BFEs).
        i. A preliminary 1D HEC-RAS model was constructed; it showed a 0.7' rise due to the project.
    c. To further analyze impact, ordinances and Federal Regulations allow the use of best available information.
        i. Use FEMA 2D BLE model as recommended by Tom Birney from FEMA Region 8.
        ii. *Preliminary FEMA maps developed by FEMA do not show the project within the future refined floodplain.*
2. FEMA 2D model adjustments and results/impact of interchange project
    a. FEMA BLE HEC-RAS 2D model was used as best available information to show impact due to the project.
        i. FEMA has started a map update process for Brookings county using the BLE 2D model, but it is in the beginning stages and will not become effective until 2-4 years depending on many factors such as funding and covid19.
        ii. **Existing Conditions Model:** The BLE model was updated with culvert information surveyed with this project. ground survey of the project area also replaced lidar terrain in the existing model.
        iii. **Proposed Conditions Model:** A future preliminary roadway embankment was added to the east side of the interstate to 34th Avenue. The existing culverts sizes were not changed in the proposed model.
    b. There is no impact due to the project using the BLE 2D model. Water surface elevations do not change between the existing and proposed conditions model.
3. Floodplain Development Permit
    a. A floodplain development permit will be submitted to the City and County which will document the impact of the project.

b. A follow-up LOMR may be necessary. FEMA will be consulted with to determine course of action since project was shown not to have an impact.

4. Downstream drainage concerns
    a. Downstream of the project area are sensitive properties of which there is an active drainage lawsuit.
    b. Goal should be to maintain existing drainage patterns, so we do not cause another drainage issue and potentially another drainage lawsuit.
    c. Golf Course area has some local drainage which does not seem correct in the BLE 2D Model. Additional breaklines were not included which may make the model perform closer to what the City has known to experience in past flooding events. The FEMA BLE 2D HEC-RAS model will be updated and rerun to more closely model the flow through the future loops and existing drainage channels.
    d. After leaving the golf course, drainage pattern is east in a ditch along the north side of 20th Street South and then into a pond owned by Mills. Then it is within a drainage channel (not the Interstate 29 road side ditch) until it gets to the Bowes area and eventually through a box culvert under I-29.
    e. It is not favorable to drain golf course area drainage to the east side of the interstate. It is preferable to maintain drainage patterns through the loops.
5. Setting the road gradeline of 20th Street South interchange.
    a. We reviewed the City of Brookings Design Guidelines which use the 5-year and 100-year as the minor and major storm events.
    b. Thad Drietz said 20th Street South will be a Minor Arterial street classification.
    c. See Attachment 1 for Table 14 - Allowable Maximum Culvert Overtopping requirements from the City of Brookings Drainage Design and Technical Criteria Manual.
    d. A previous conversation between Kent Johnson and Kevin Marton, SDDOT, confirmed design guidelines followed by SDDOT. See Attachment 2.
        i. These requirements differ from City of Brookings requirements.
        ii. The allowable design headwater elevation (25-year water surface elevation) should not exceed 1-ft below the low subgrade shoulder at the lowest point of the roadway within the drainage basin.
    e. After discussion, Jackie Lanning said they want to follow the SDDOT design guidance for a local collector even though the City's street classification is a Minor Arterial.

PREPARED BY Kent R. Johnson, PE

South Dakota DOT
Connecting South Dakota and the Nation

Department of Transportation
Environmental Office
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
605/773-4336

SEP 09 2020
South Dakota SHPO

September 8, 2020

Jenna Dietmeier, Review & Compliance Archaeologist
State Historic Preservation Office
Cultural Heritage Center
900 Governors Drive
Pierre, SD 57501-2217

Pursuant to 36 CFR part 800.13, if historic properties are discovered or unanticipated effects on historic properties found after the agency official has completed the Section 106 process, the agency official shall avoid, minimize or mitigate the adverse effects to such properties and notify the SHPO/THPO, and Indian tribes that might attach religious and cultural significance to the affected property within 48 hours of the discovery

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Ms. Dietmeier:

Attached for your review are two cultural resources survey reports, entitled, *A Level I Literature Review of the Proposed Interstate Exchange Project Area in Brookings, Brookings County, South Dakota*, by Troy Kogel and *A Level III Cultural Resources Survey of the Proposed Interstate 29 Interchange at 20th Street South, Brookings, Brookings County, South Dakota*, by Troy Kogel. Structure BK00000575 and two other structures within SW ¼ of the SD ¼ of Section 31, Township 110N, and Range 49W were not relocated; they were likely torn down when the property became an aggregate quarry. Structures BK 00002371, BK00002372, and BK 00002373 were identified and were recommended not eligible for inclusion on the National Register of Historic Places (NRHP). Seven mobile homes were also identified. The mobile homes were not eligible for inclusion on the NRHP.

The report recommends that a Section 106 finding of *No Historic Properties Affected* be granted for this project. The SDDOT concurs and requests SHPO concurrence in a Section 106 determination of *No Historic Properties Affected* for this project.

Should any evidence of buried cultural resources be encountered during the project construction activities, such activities will cease and the SHPO in Pierre or the ARC in Rapid City will be notified immediately in order to determine an appropriate course of action.

Sincerely,

Joanne M. Hight

Joanne Hight
Environmental Engineer Manager
605.773.3721

Attachment

SECTION 106 DETERMINATION
Based upon the information provided to the South Dakota State Historic Preservation Office on 9/9/2020, we concur with your agency's determination of "No Historic Properties Affected" for this undertaking.

Jay D. Vogt
State Historic Preservation Officer (SHPO)
By: Heather Nelson
9/11/2020 — 20090900 1F
Date — SHPO Project #

SECTION 106 CONSULTATION
Concurrence of the State Historical Preservation Office does not relieve the federal agency official from consulting with other appropriate parties, as described in 36 CFR Part 800.2(c).

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
South Dakota Field Office
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408

In Reply Refer to:
EM 0295(45)130, PCN 020V

September 17, 2020

Ms. Joanne Hight
Environmental Engineer Manager
South Dakota Department of Transportation
700 East Broadway Avenue
Pierre, South Dakota. 57501

Dear Ms. Hight

This letter is in response to your request received August 25, 2020, for environmental comments regarding the above referenced project involving the interchange justification study, environmental study, right-of-way, and design for the I-29 exit 130 interchange. This project is located in Brookings County, South Dakota.

According to the National Wetlands Inventory, (available online at www.fws.gov/wetlands/) wetlands exist within the project boundary. If a project may impact wetlands or other important fish and wildlife habitats, the U.S. Fish and Wildlife Service (Service), in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347) and other environmental laws and rules, recommends complete avoidance of these areas, if possible, then minimization of any adverse impacts, and finally replacement of any lost acres, in that order. Alternatives should be examined and the least damaging practical alternative selected. If wetland impacts are unavoidable, a mitigation plan addressing the number and types of wetland acres to be impacted, and the methods of replacement should be prepared and submitted to the resource agencies for review.

The U.S. Fish and Wildlife Service concurs with your conclusions that the described project will not adversely affect listed species. Contact this office if changes are made or new information becomes available.

The Service appreciates the opportunity to provide comments. If you have any questions on these comments, please contact Dylan Turner of this office at (605) 224-8693, Extension 233.

Sincerely,

Scott Larson
Field Supervisor
South Dakota Field Office

APPENDIX C: SECTION 4(F) AND 6(F) COORDINATION

Coordination with City of Brookings Parks, Recreation, and Forestry

Draft Section 4(f) De Minimis Official with Jurisdiction (OWJ) Concurrence

Unruh, James

From: Charlie Richter <CRichter@cityofbrookings-sd.gov>
Sent: Monday, August 5, 2024 6:04 PM
To: Kristin Zimmerman
Cc: John Thompson; Thad Drietz; Richard Uckert; Unruh, James; Rust, Jill; Baker, Becky; McGregor, Kelsey; Ceroll, Ronald
Subject: FW: Proposed Land Swap for Golf Course
Attachments: Golf Course Impact Mitigation Mtg Notes and Concurrence Letter 07 30 24.pdf

Kristin,

Please review the attached draft concurrence letter and meeting minutes. Let us know your thoughts.

Everyone – It appears that ITC **does** have an easement on the golf course which is surprising(see below and attached).

Charles L. Richter, P.E.
City Engineer
City of Brookings
520 Third Street
Brookings, SD 57006
Phone: (605) 692-6629
E-mail: crichter@cityofbrookings-sd.gov

www.cityofbrookings-sd.gov | www.facebook.com/cityofbrookings | www.instagram.com/cityofbrookings

From: Unruh, James <James.Unruh@hdrinc.com>
Sent: Wednesday, July 31, 2024 3:35 PM
To: Charlie Richter <CRichter@cityofbrookings-sd.gov>; Richard Uckert <richu@bannerassociates.com>
Cc: Rust, Jill <jill.rust@hdrinc.com>; Baker, Becky <Rebecca.Baker@hdrinc.com>; McGregor, Kelsey <kelsey.mcgregor@hdrinc.com>; Ceroll, Ronald <ron.ceroll@hdrinc.com>
Subject: RE: Proposed Land Swap for Golf Course

Meeting notes and draft City concurrence letter are in this attached file: *Golf Course Impact Mitigation Mtg Notes and Concurrence Letter 07 30 24.pdf*
Please forward this file to City staff as appropriate and especially to Kristin Zimmerman.

Please note this item we included in the meeting notes:

ITC Building Considerations

- Modifications will be necessary to the ITC building for the intersection expansion
- *Post-meeting follow-up: The recent title search for the golf course property included this line item:*

9. Telephone Line Right-of-Way Easement. Dated 01/31/1956, Filed 05/26/1970 at 3:20 PM in Book 84 of Misc., Page 635.

See the next sheet for the easement document.

Here is the key paragraph from the easement document:

Attract approximately 160 acres located 2 miles in a S E direction from the town of Brookings and further described as the S W. quarter of Section 31, Township 110, Range 49,
and to construct, reconstruct, operate and maintain on or under the above described lands and/or in, upon or under all streets, roads or highways abutting said lands, a telephone line or system, to cut, trim or chemically spray trees and shrubbery that may interfere with or threaten to endanger the operation and maintenance of said line or system and to license, permit or otherwise agree to the joint use or occupancy of said line or system by any other person, firm or corporation for telephone or electrification purposes.

I assume this means that our project will pay for modifications to the ITC

James Unruh, P.E.
D 605.977.7766

hdrinc.com/follow-us

From: Unruh, James <James.Unruh@hdrinc.com>
Sent: Monday, July 29, 2024 10:11 AM
To: Charlie Richter <CRichter@cityofbrookings-sd.gov>
Cc: John Thompson <JThompson@cityofbrookings-sd.gov>; Rust, Jill <jill.rust@hdrinc.com>; Baker, Becky <Rebecca.Baker@hdrinc.com>
Subject: RE: Proposed Land Swap for Golf Course

Please forward the attached document to the current City Parks Director: *Section 6(f) Impact Mitigation Memo 06 28 24.pdf*.
Then please set up a video conference with the current City Parks Director, City Engineering/PW staff, and HDR staff.
We will prepare an additional requested graphic for the video conference.

HDR staff is relatively flexible for availability this week.

James Unruh, P.E.
D 605.977.7766

hdrinc.com/follow-us

From: Charlie Richter <CRichter@cityofbrookings-sd.gov>
Sent: Monday, July 29, 2024 9:29 AM
To: Unruh, James <James.Unruh@hdrinc.com>
Cc: John Thompson <JThompson@cityofbrookings-sd.gov>
Subject: Proposed Land Swap for Golf Course

James,

Our Parks Director isn't aware of all of the details on the proposed land swap for the golf course as part of the 20th St S/22nd Ave widening project so we will need to get her some information. Do you have a graphic to share with us that would clearly depict this swap? It also may be good for all of us to meet with her to discuss this swap and the process for this. Randy from Games Fish and Parks reached out to her already so it would be helpful to get her fully up to speed. Let us know if this can be provided. Thanks.

Charles L. Richter, P.E.
City Engineer
City of Brookings
520 Third Street
Brookings, SD 57006
Phone: (605) 692-6629
E-mail: crichter@cityofbrookings-sd.gov

www.cityofbrookings-sd.gov | www.facebook.com/cityofbrookings | www.instagram.com/cityofbrookings

Meeting Notes

Project:	I-29 Exit 130 (20th Street) Interchange – PCN 020V
Subject:	Review Golf Course Impacts with 20th St/22nd Ave Intersection Expansion
Date:	July 30, 2024
Location:	Video Conference
Attendees:	Charlie Richter, John Thompson, Kristin Zimmerman (Brookings); Becky Baker, James Unruh (HDR)
Copy to:	Rich Uckert (Banner), Kelcey McGregor (HDR)

Concurrence Letter

HDR generated a draft concurrence letter with figures regarding golf course and trail impacts associated with the expansion of the 20th Street/22nd Avenue intersection. The group reviewed the letter and associated figures (attached to these meeting notes).

Follow-up: City staff will review the letter and provide comments.

SD Game Fish and Parks Coordination

- Kristin has been working with Randy Kittle of SDGFP on several projects and the 20th Street/22nd Avenue expansion project came up.
- Randy Kittle confirmed that yellow-book appraisals will be necessary for the two golf course parcels.

Follow-up: HDR will initiate the appraisal process.

ITC Building Considerations

- Modifications will be necessary to the ITC building for the intersection expansion
- *Post-meeting follow-up: The recent title search for the golf course property included this line item:*

> 9. Telephone Line Right-of-Way Easement. Dated 01/31/1956, Filed 05/26/1970 at 3:20 PM in Book 84 of Misc., Page 635.

See the next sheet for the easement document.

635

Telephone Line Right-of-Way Easement

Know all men by these presents, that we, the undersigned (whether one or more) C Pete Jensen and Laura (husband and wife) (~~unmarried~~), for a good and valuable consideration, the receipt whereof is hereby acknowledged, do hereby grant and convey unto Brookings County Telephone Cooperative Association, Inc., a cooperative association (hereinafter called the "Association"), whose post office address is Brookings, South Dakota, and to its successors and assigns, the right to enter upon the lands of the undersigned, situated in the county of Brookings state of South Dakota, and more particularly described as follows:

Attract approximately 160 acres located 2 miles in a S E direction from the town of Brookings and further described as the S W. quarter of Section 31, Township 110, Range 49,

and to construct, reconstruct, operate and maintain on or under the above described lands and/or in, upon or under all streets, roads or highways abutting said lands, a telephone line or system, to cut, trim or chemically spray trees and shrubbery that may interfere with or threaten to endanger the operation and maintenance of said line or system and to license, permit or otherwise agree to the joint use or occupancy of said line or system by any other person, firm or corporation for telephone or electrification purposes.

The undersigned agree that all poles, wires and other facilities, including all telephone equipment, installed on the above described premises at the Association's expense shall remain the property of the Association and shall be removable at the option of the Association.

The undersigned represent that said lands are free and clear of encumbrances and liens except $500.00

City of Brookings

In Witness whereof, the undersigned have set their hands this 31 day of Jan, 1956

Carl C. Jensen

Laura Jensen

State of South Dakota)
)ss
County of Brookings)

On this the 31 day of Jan, 1956, before me, H L Lievan the undersigned officer, personally appeared C A Jensen and Laura (husband and wife) (unmarried), known to me or satisfactorily proven to be the persons whose names (are) (is) subscribed to the within instrument and acknowledged that they executed the same for the purposes therein contained.

In witness whereof I have hereunto set my hand and official seal.

My commission expires Jan 17 1962

H L Lievan
Notary Public, South Dakota

STATE OF SOUTH DAKOTA, COUNTY OF BROOKINGS-SS.
FILED THIS 26 DAY OF May 1956 AT 9:30 O'CLOCK A.M. BOOK 84 Misc.
PAGE 635 Rachel Hasselbusch
REGISTER OF DEEDS DEPUTY

Department of Transportation
Environmental Office
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
605/773-4336

August XX, 2024

Kristin Zimmerman
City of Brookings Parks, Recreation & Forestry
520 3rd Street, Suite 130
Brookings, SD 57006

Subject: Official with Jurisdiction (OWJ) Concurrence for Section 6(f) Property Impact and Mitigation for Edgebrook Golf Course and Section 4(f) *De Minimis* Finding for Allyn Frerichs Trail

RE: Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange; 20th Street and 22nd Avenue Expansion Supplemental Environmental Assessment

Dear Ms. Zimmerman:

The City of Brookings proposes to expand the 20th Street / 22nd Avenue intersection to better accommodate large truck traffic. This will involve acquisition of permanent right-of-way (ROW) for roadway purposes and temporary easement for construction from the southwest corner of Edgebrook Golf course. A portion of the Allyn Frerichs trail will be reconstructed for the expanded intersection.

Replacement / mitigation of 8,400 square feet of permanent ROW acquisition is proposed by transfer of a 20-foot-wide strip of property along the south edge of the golf course to City ownership. The area of the proposed replacement property is 23,629 square feet.

Attached Figures 1 and 2 (**Attachment A**) illustrate:

- Work completed with the 2022 / 2023 I-29 / 20th Street interchange project,
- Proposed 20th Street / 22nd Avenue intersection expansion tentatively scheduled for 2025 construction (pending funding availability).
- Proposed permanent ROW acquisition and temporary construction easement as well as the replacement / mitigation area.

Background

As part of the I-29 20th Street interchange project, permanent impact and associated conversion of Section 6(f) property (Edgebrook Golf Course) was avoided by:

- Realignment of 20th Street to the south and onto private property along Edgebrook Golf Course.
- Implementation of a sub-standard intersection corner design at the 20th Street / 22nd Avenue intersection.

The I-29 20th Street interchange project was funded with a $23.3 million US Department of Transportation grant that covered 80% of the project costs. The City of Brookings, Brookings County, and private donors covered the remaining 20% of the project costs. The time constraints stipulated in the grant did not allow for the approval process for the Section 6(f) property impact mitigation without jeopardizing the overall grant funding. Without the grant funding, the interchange construction project would not have been initiated or completed.

In a letter dated December 3, 2020, City Parks and Recreation director Dusty Rodiek concurred with the:

- Section 4(f) ***de minimis*** finding for the Allyn Frerichs trails
- Temporary occupancy of Section 6(f) property associated with 20th Street construction near the Edgebrook Golf Course.

Section 6(f) (Edgebrook Golf Course) and Section 4(f) (Allyn Frerichs Trail) Impacts

Expansion of the 20th Street / 22nd Avenue intersection will impact 8,400 square feet of the southwest corner of Edgebrook Golf Course. This area is needed to:

- Expand the intersection pavement to facilitate truck turning movements,
- Provide space for traffic and pedestrian signals,
- Rebuild the trail to meet ADA slope requirements,
- Provide a sight triangle for vehicles,
- Allow space for relocation of the ITC building.

Impact Mitigation

During the ROW acquisition process, it was discovered that the golf cart path between the 11th hole green and the 12th hole tee had been built on the adjacent private property.

To build the I-29 20th Street interchange, SDDOT acquired approximately 10 acres from the property owner on the south side of 20th Street. The acquisition documentation was split into two tracts and two separate plats. One of the tracts was 20 feet wide and approximately 1,181 feet long and includes the cart path. The intent is to utilize this 23,629 square foot parcel as mitigation for the impacted area in the southwest corner of the golf course. As part of the Section 6(f) mitigation process, the parcel will be deeded to Edgebrook Golf Course/City of Brookings Parks, Recreation & Forestry Department.

It is noted that the 8,400 square foot area proposed for ROW acquisition does not serve a functional role for golf course operations. Whereas the 23,629 square foot mitigation area has and will continue to be a critical component of golf course operations with the cart path and the area adjacent to four of the golf course greens and tee boxes.

During trail construction, the temporary detour route will be the ADA compliant sidewalk on the west side of 22nd Avenue.

If you concur with the measures to mitigate the permanent ROW acquisition of Section 6(f) (Edgebrook Golf Course) property and the ***de minimis*** impact to Section 4(f) (Allyn Frerichs trail) property in regard to the proposed project, please indicate as such by providing your signature in the space provided below at your earliest convenience.

Thank you for your time and cooperation on this matter. If you have questions and/or concerns, please feel free to contact me.

Sincerely,

Joanne Hight
Environmental Engineer Manager
605.773.3721
Joanne.hight@state.sd.us

Attachments

OWJ Concurrence:

_____ _____

Name Date

Drawn By: B.Miller
Date: 7/30/2024
Chked By: J.Unruh
Date: 7/30/2024
Revision:

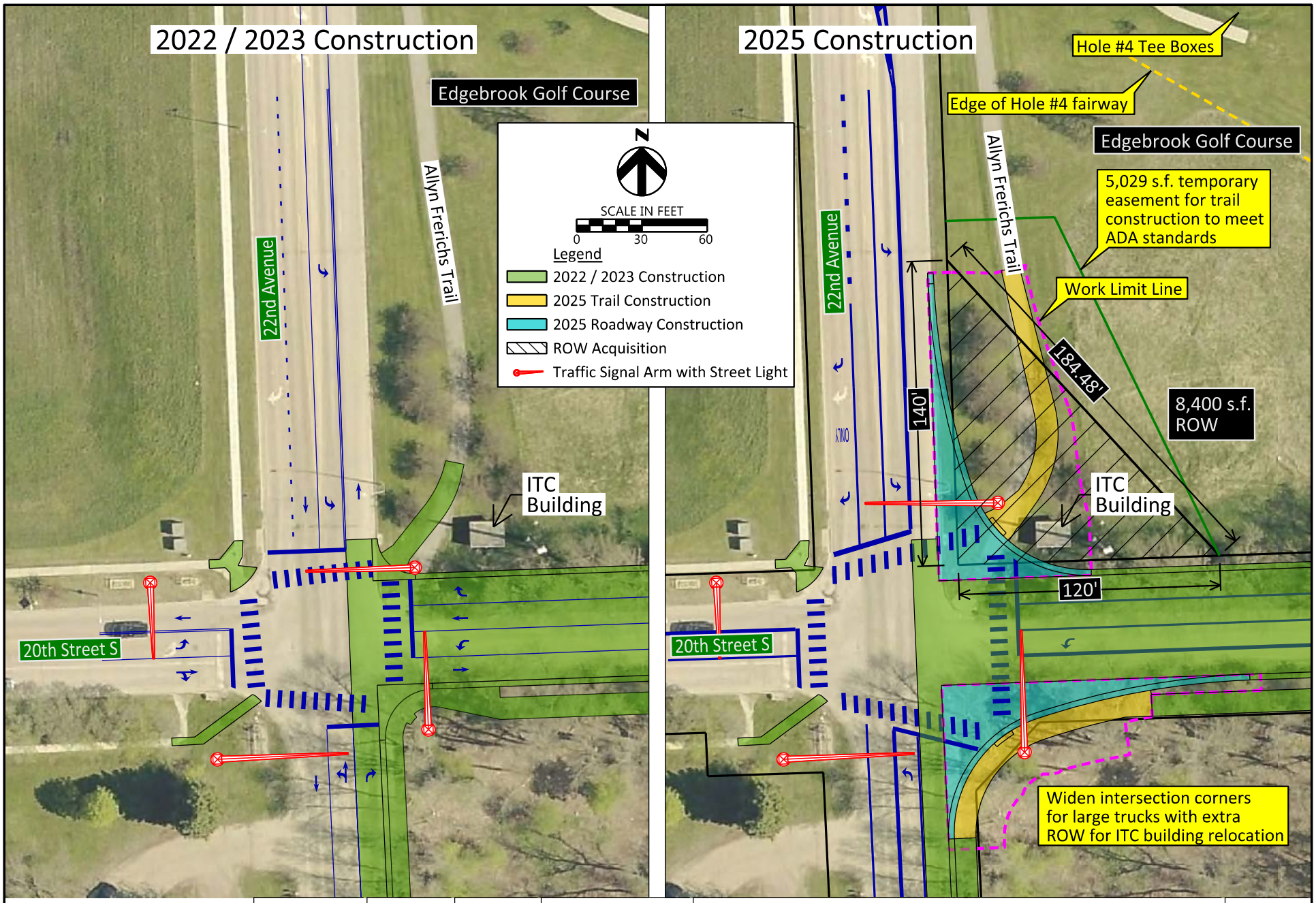
DOT | brookings | HDR BANNER

20th Street Improvements at Edgebrook Golf Course
Section 4(f) and 6(f) Impacts and Mitigation

I-29 Exit 130 (20th Street S) Interchange PCN 020V Brookings, SD

Figure 1

Attachment A



Drawn By: B.Miller
Date: 7/30/2024
Chked By: J.Unruh
Date: 7/30/2024
Revision:

20th Street and 22nd Avenue Improvements
Section 4(f) and 6(f) Impacts and Mitigation
I-29 Exit 130 (20th Street S) Interchange PCN 020V Brookings, SD

Figure 2

Attachment A

Coordination with SD Game Fish and Parks
Section 6(f) Coordinator

Section 6(f) Conversion of Use

Technical Memo

Date: June 28, 2024

Project: I-29 Exit 130 (20th Street South) Interchange (PCN 020V)

To: Randy Kittle South Dakota Game, Fish, and Parks (SDGFP)

From: HDR

Subject: **Proposed Section 6(f) – (Edgebrook Golf Course) Impact Mitigation**

1. Purpose

The purpose of this memo is to document a proposed mitigation plan for permanent impacts to and associated conversion of Section 6(f) property. Specifically, we propose to impact 8,400 square feet of Edgebrook Golf Course property at the 20th Street/22nd Avenue intersection (southwest corner of the golf course) and replace it with 23,629 square feet along the south edge of the golf course.

2. Golf Course Impact Avoidance

As part of the I-29/20th Street interchange project, permanent impact and associated conversion of Section 6(f) property was avoided by:

- Realignment of 20th Street to the south and onto private property along Edgebrook Golf Course.
- Implementation of a sub-standard intersection corner design at the 20th Street/22nd Avenue intersection.

3. 20th Street/22nd Avenue Intersection Design

The decision about the sub-standard intersection corner design was made at the August 19, 2020, Preliminary Design Inspection (PDI) meeting. The screen clips below are from the PDI meeting summary letter.

Meeting attendees were:

Attendees:	Matt Brey, Joel Gengler, Brook White, Scott Rabern, Brad Richards, Kelly VanDeWiele, Mark Peterson (SDDOT); Kirk Van Roekel, Brett Hestdalen (FHWA); Jackie Lanning, Thad Drietz, Bret Henning (City of Brookings); Larry Jensen (Brookings County); Waylon Blasius, Rich Uckert (Banner); Brenda Miller, Ron Ceroll, Lee Kaffar, Troy Borchard, Lance McQueen, James Unruh (HDR)

This was the key meeting discussion related to the intersection design:

- 22nd Avenue Design
  - *With this project, we are unable to provide large enough corner radii for WB-67 trucks without impacting the golf course (Section 6f property) and thereby jeopardizing the grant funding timeframe.*
  - *Widening and realigning 22nd Avenue is not feasible with this project because it was not part of the grant award, and it has not been budgeted for the City of Brookings to pay for the improvement at this time.*
  - *The City will amend the 22nd Avenue corridor study to include the 20th Street intersection and then look at intersection improvements to alleviate the inadequate corners.*
  - *For the immediate timeframe, large trucks will have trouble making right turns at the 22nd Avenue/20th Street intersection.*

This screen clip from a PDI meeting graphic illustrated the intersection and truck turning constraints:

4. **Environmental Assessment (EA) and Finding of No Significant Impact (FONSI)**
   The EA was released for public comment on October 19, 2020. Included in the EA was the September 11, 2020, SDGFP concurrence with no adverse impact to Section 6(f) property (see **Attachment A).**

   The FONSI was signed by SDDOT and FHWA on January 22, 2021. This allowed the design and right-of-way acquisition to proceed. The "Project Ready" date was met which allowed the use of the BUILD Grant funds for the project construction. A condition of the grant was meeting the challenging timeframe.

5. **Construction**
   Bid letting was on November 17, 2021, and construction began in 2022 and was completed in 2023. All roadways were open to traffic by July 31, 2023. Golf course operations were not impacted during project construction.

   Attachment B and **Attachment C** Figure 39a provide photos of the completed project at the 20th Street/22nd Avenue intersection.

6. **Operational Complaints**
   Complaints from truck drivers (and others with trucks and trailers) began soon after the intersection was open to traffic because of the turning limitations and associated operation issues. The project team (City of Brookings, SDDOT, HDR) then took these steps:
   - An interim pavement marking plan was developed that reduced the number of lanes at the intersection but provided more room for turning (see **Attachment C**, Figure 39a left side). This plan is intended for implementation in 2024.

- The corridor study design for 22nd Avenue was extended to 20th Street and included an expansion of the intersection corners to accommodate trucks (See **Attachment C**, Figure 39b right side). Expansion of the 20th Street intersection corners on the east side of 22nd Avenue is tentatively planned for 2025 or 2026 construction. According to FHWA, remaining BUILD grant funding may be used for this construction if completed by June 30, 2025. Additional sources of funding may need to be secured.

7. **Section 6(f) (Edgebrook Golf Course) Impacts**
   Expansion of the 20th Street/22nd Avenue intersection will impact 8,400 square feet of the southwest corner of Edgebrook Golf Course. This area is needed to:
   - Expand the intersection pavement to facilitate truck turning movements,
   - Provide space for traffic and pedestrian signals,
   - Rebuild the trail to meet ADA slope requirements,
   - Provide a sight triangle for vehicles,
   - Allow space for relocation of the ITC building.

   The 8,400 square feet will become roadway right-of-way.

8. **Mitigation Proposal**
   During the ROW acquisition process, it was discovered that the golf cart path between the 11th hole green and the 12th hole tee had been built on the adjacent private property.

   To build the interchange, SDDOT acquired approximately 10 acres from the property owner on the south side of 20th Street. The acquisition documentation was split into two tracts and two separate plats. One of the tracts was 20 feet wide and approximately 1,181 feet long and includes the cart path. The intent is to utilize this 23,629 square foot parcel as mitigation for the impacted area in the southwest corner of the golf course. See **Attachment D** for the right of way plan and plats. As part of the Section 6(f) mitigation process, the plat will be deeded to Edgebrook Golf Course/City of Brookings Parks, Recreation & Forestry Department.

9. **Follow-up**
   - HDR intends on preparing an Environmental Assessment Supplement for the proposed improvement actions.
   - Randy will initiate discussions on this issue with the National Park Service.
   - Randy will verify that yellow-book appraisals and review appraisals will be required by National Park Service for this proposed conversion and mitigation process. HDR does have an appraisal firm available to conduct the appraisals; HDR staff will conduct the review appraisals.
   - Randy will provide HDR with direction on necessary documentation.
   - HDR to meet with City parks staff on this proposed work.

Department of Transportation
Environmental Office
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
605/773-4336

September 10, 2020

Randy Kittle
South Dakota Game, Fish, and Parks
Joe Foss Building, 523 East Capitol Avenue
Pierre, SD 57501

RE: **Section 6(f) Impact Considerations**
Project EM 0295(45) 130, PCN 020V, Brookings County
I-29 Exit 130 (20th Street South) Interchange
Interchange Justification Study, Environmental Study, Right-of-Way & Design

Dear Mr. Kittle:

The City of Brookings, South Dakota Department of Transportation (SDDOT), and Federal Highway Administration (FHWA) have continued development of this project and identified the preferred alternative for a new interchange on Interstate 29 (I-29) at 20th Street South within Brookings, SD. Attached is a map showing the location of the above project (Figure 1).

Edgebrook Golf Course is a regulation public 18-hole facility with a nine-hole junior/short course located at 1415 22nd Avenue South. It is owned and operated by the City of Brookings. Fees are reviewed and set annually by Brookings Parks & Recreation Advisory Board and include single rounds of golf and seasonal passes. The clubhouse offers golf carts and equipment for rent as well as pro shop. Edgebrook also provides professional golf lessons by appointment. Three Land and Water Conservation Fund (LWCF) grants (46-00166, 46-00304, and 46-01035) were obtained to develop the Edgebrook golf course. Therefore, the entire golf course is protected under Section 6(f) for public outdoor recreation.

No permanent right-of-way is needed for the 20th Street construction and no operations of the golf course would be impacted. A temporary easement would be needed to complete the work along the south edge of the golf course near 20th Street. A total of 0.12 acres within the golf course property will be temporarily impacted and 0.28 acres of temporary easement would be required for construction (See Figure 2). The area will be re-graded and reseeded to a similar or better condition once construction of the area is complete.

Minimal grading would be needed along the south edge of the golf course for 20th Street construction as shown in attached Figure 1. The alignment of proposed 20th Street has been shifted to the south specifically to avoid impacts to the golf course. Near 22nd Avenue, the 20th Street fill slope would extend onto the City-owned golf course property as shown in the Section A-A view of Figure 1. This allows 20th Street to line up across 22nd Avenue. Construction within this area will take less than 6 months and no operations of the golf course will be impacted.

I am requesting your concurrence that the work being conducted will be considered a temporary non-conforming use 6(f) impact. If you concur, please indicate as such by providing your signature in the space provided below at your earliest convenience so the project's environmental documentation can be completed. Thank you for your time and cooperation on this matter. If you have questions and/or concerns, please feel free to contact me.

Sincerely,

Joanne M. Hight

Joanne Hight
Environmental Engineer Manager
605.773.3721

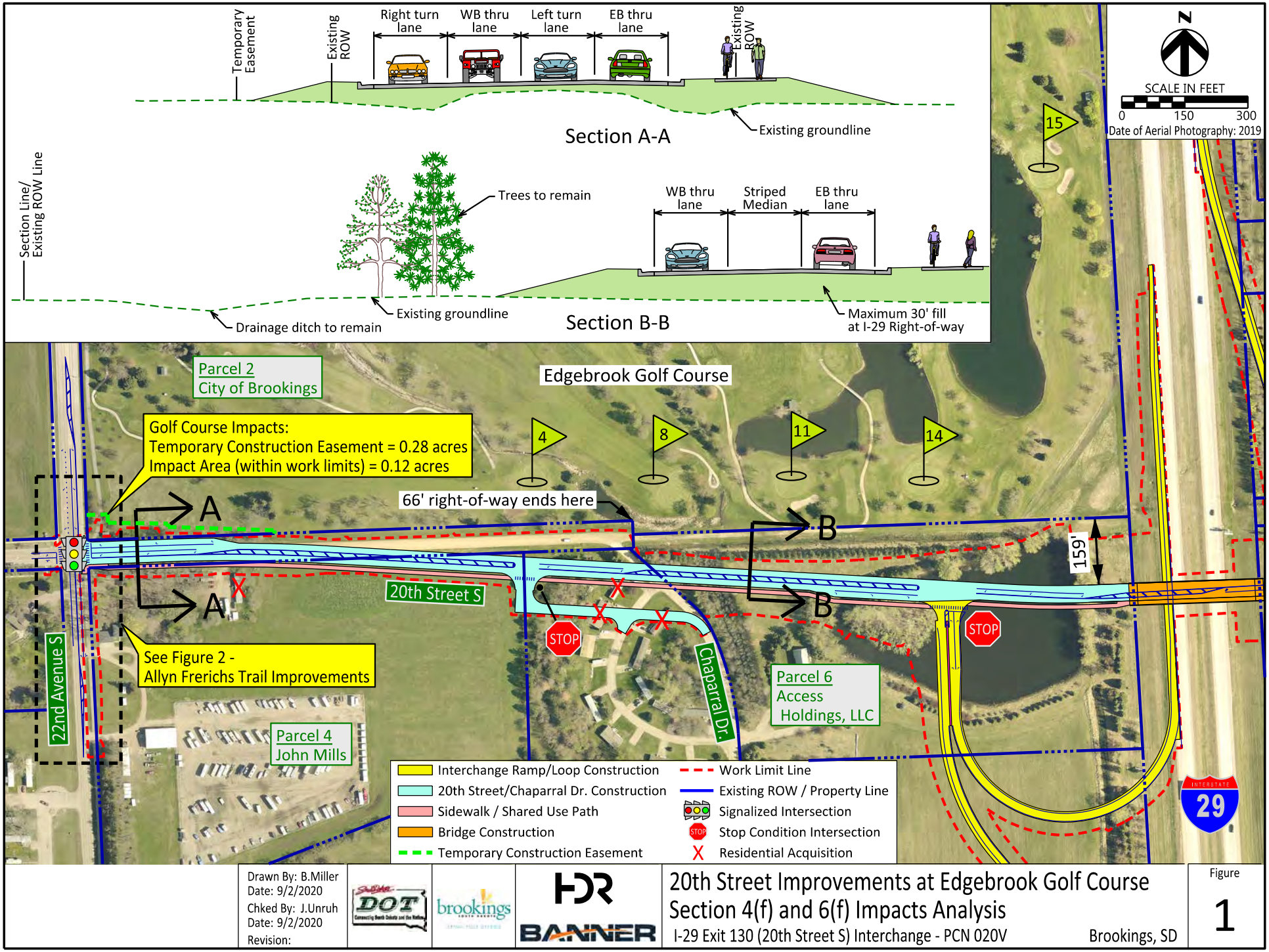
Attachment

Concurrence: As the designated alternate State Liason Officer who administers LWCF Program funds, I hereby concur that the use and impacts of the I-29 Exit 130 (20th Street South) Interchange project combined with identified avoidance, minimization, and mitigation measures, will not adversely affect the activities, features, and attributes that qualify Edgebrook Golf Course for protection under Section 6(f) and that the activities fall under a temporary, non-conforming use..

Randy Kittle 9/11/2020

Randy Kittle Date:

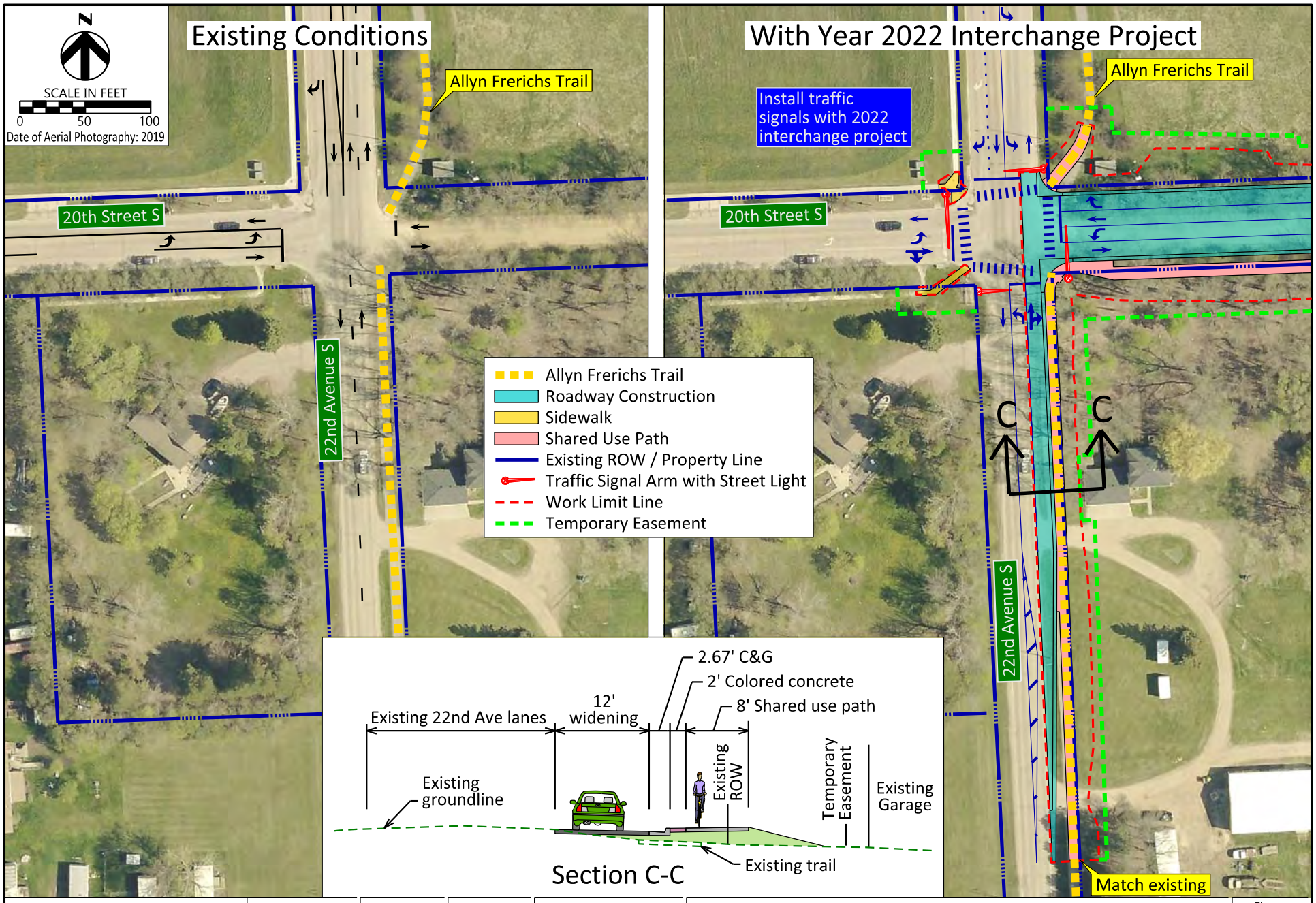
South Dakota Game, Fish, and Parks



Drawn By: B.Miller
Date: 9/2/2020
Chked By: J.Unruh
Date: 9/2/2020
Revision:

20th Street Improvements at Edgebrook Golf Course
Section 4(f) and 6(f) Impacts Analysis
I-29 Exit 130 (20th Street S) Interchange - PCN 020V
Brookings, SD

Figure
1

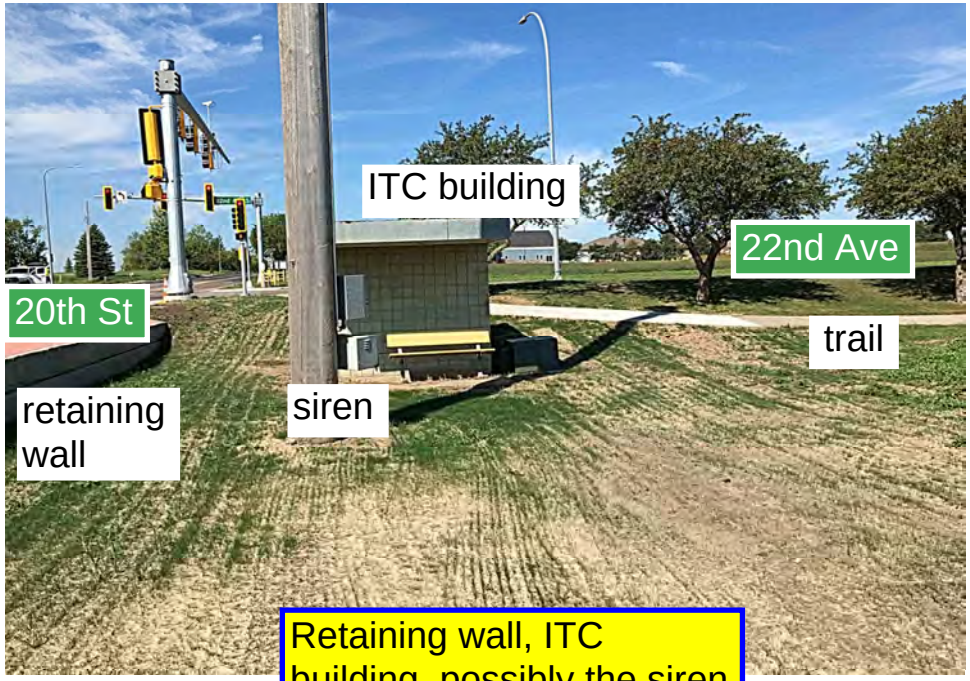


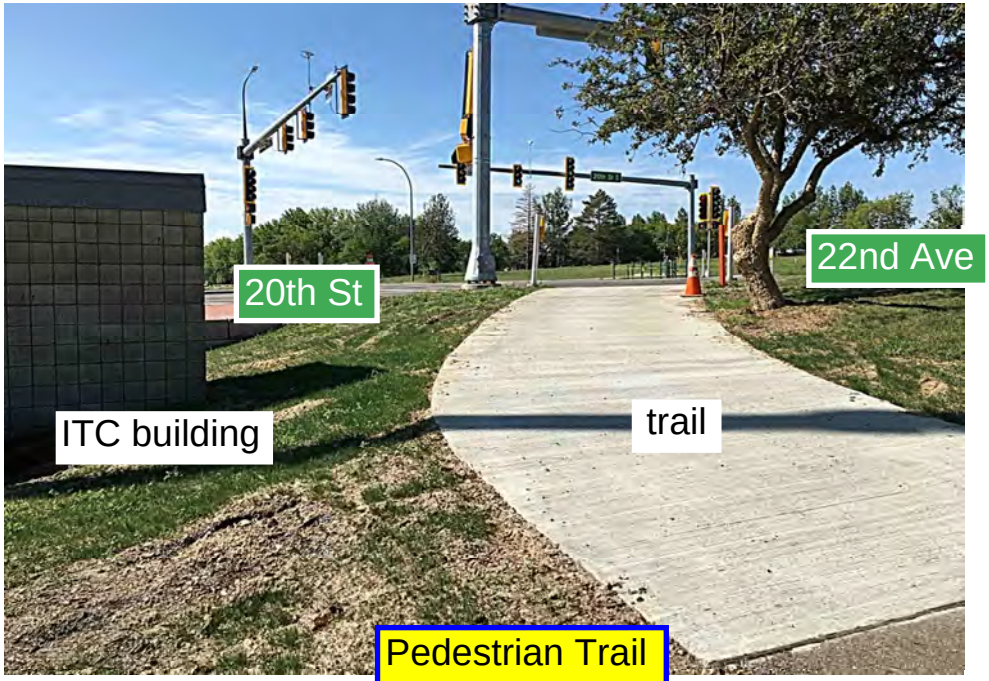
Drawn By: B.Miller
Date: 9/2/2020
Chked By: J.Unruh
Date: 9/2/2020
Revision:

Allyn Frerichs Trail Improvements
Section 4(f) and 6(f) Impacts Analysis
I-29 Exit 130 (20th Street S) Interchange - PCN 020V
Brookings, SD

Figure 2

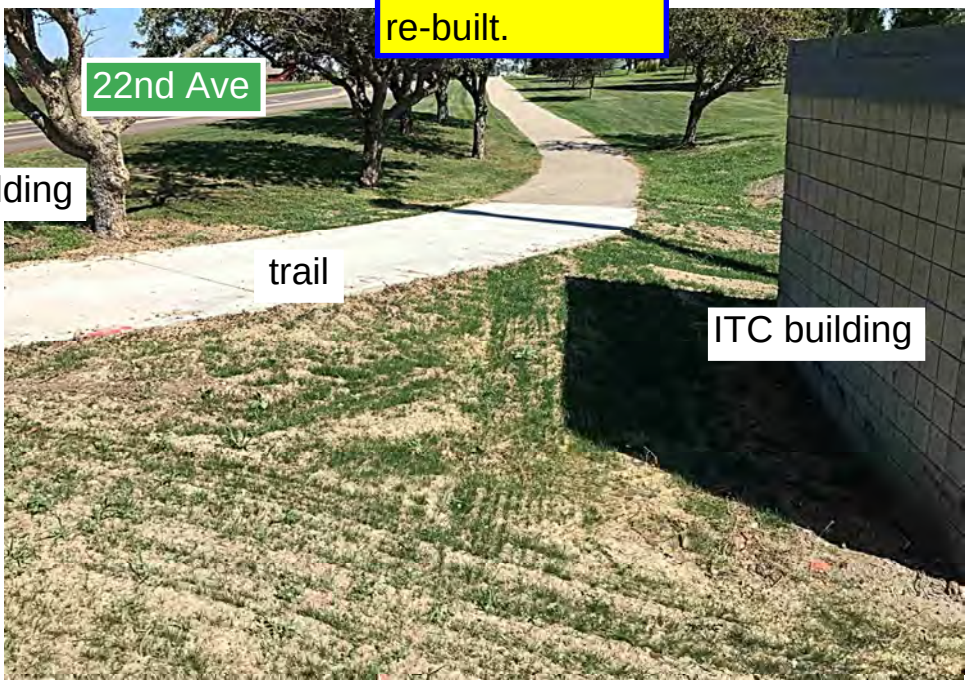
Section 6(f) Impact Mitigation Memo
Attachment A - SDGF&P Concurrence Letter from 2020





Retaining wall, ITC building, possibly the siren pole will be impacted.

Pedestrian Trail will need to be re-built.



7/29/2023 Open to Traffic Condition

Looking south along 22nd Ave


Looking west along 20th Street

Edgebrook Golf Course

20th Street S

22nd Avenue S


Looking north along 22nd Ave


Looking north along 22nd Ave

2024 Re-striping to Reduce Large Truck Conflicts

Legend
- Roadway Construction
- Sidewalk or Trail Construction
- Previously Constructed
- ROW Acquisition
- Traffic Signal Arm with Street Light

SCALE IN FEET
0 30 60

Edgebrook Golf Course

ITC Building

20th Street S

22nd Avenue S


Truck turning at 20th Street

Drawn By: B.Miller
Date: 10/31/2023
Chked By: J.Unruh
Date: 10/31/2023
Revision: 8/7/2024

20th Street S / 22nd Avenue S Intersection
Phased Improvements
I-29 Exit 130 (20th Street S) Interchange
Brookings, SD

Figure 39a

2025 Construction

Hole #4 Tee Boxes

Edgebrook Golf Course

Edge of
Hole #4 fairway

Work Limit Line

Temporary Easement for trail construction to meet ADA standards (final area pending)

Widen intersection corners for large trucks with extra ROW for ITC building relocation

8,400 Sq.Ft.
additional R.O.W.

20th Street S

624 Sq.Ft.
additional R.O.W.

22nd Avenue S

Legend

- Roadway Construction
- Sidewalk or Trail Construction
- Previously Constructed
- ROW Acquisition
- Traffic Signal Arm with Street Light

By Year 2045

Widen 22nd Avenue to 5 - 11' lanes and add right turn lane

Add right turn lane

Edgebrook Golf Course

Set roadway right-of-way limits for development plans

ITC Building

20th Street S

Set roadway right-of-way limits for development plans

Widen 22nd Avenue to 5 lanes

22nd Avenue S

SCALE IN FEET
0 30 60

Drawn By: B.Miller
Date: 10/31/2023
Chked By: J.Unruh
Date: 10/31/2023
Revision 03/2024

20th Street S / 22nd Avenue S Intersection
Phased Improvements
I-29 Exit 130 (20th Street S) Interchange
Brookings, SD

Figure
39b

Section 6(f) Impact Mitigation Memo
Attachment C - Intersection Improvement Sequence

BAI JOB # 23192-00

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	EM 0295(45)130	5	7

Plotting Date: 1-19-2021 Revision Date: Initials:

Sec. 31 - T110N - R49W

WETLAND EASEMENT
LG EVERIST ADDITION

Sec. 31 - T110N - R49W

LG Everist Inc.

SE1/4 of Section 31 - Township 110 North - Range 49 West of the 5th P.M., Exc. the West 837 Feet of the South 520.43 Feet thereof, Exc. Tract A and Tract

Tract A

City of Brookings

Parcel A3

SW1/4

10' Existing Utility Easement

33' Existing Utility Easement

33' Existing Utility Easement

20'

Section Line

33'

33'

20+00

25+00

30+00

35+00

335+00

400+00

415+00

1/4 Line

Ramp A

Ramp B

Ramp C

Ramp G

Proposed Chaparral Drive

Chaparral Drive

Block 1

MILLS
THIRD ADDITION

Access Holdings, LLC

Parcel 3

Western Estates MHP, LLC

Parcel 2

30' Existing Access Easement

10' Existing Utility Easement

Sec. 6 - T109N - R49W

RCS Development Inc.

Parcel 4

Government Lot 4

Government Lot 3

OUTLOT 1

405+00

410+00

220+00

300'

36+98.35

39+

Property

Property

33'

Section Line

Present 20th Street S

33'

1+00

2+00

3+00

4+00

51+44.75

50+00

45+00

40+00

Proposed 20th Street S

Lake Platinum, LLC

Parcel 7

Government
Lot 2

Sec. 6 - T109N - R49W

Parcel 5
106+92.72 to 108+75.49 R
Temporary Easement containing
0.1 ac (3553 sq ft) more or less

Parcel 6
106+97.88 (Ramp A) R to
45+67.65 (20th St) L
Temporary Easement containing
0.4 ac (19558 sq ft) more or less

Section 6(f) Impact Mitigation Memo
Attachment D - ROW Plan and Plats

PARCEL 3

PLAT OF LOT H2

in Block One (1), Mills Third Addition in Government Lots 3 and 4 of the Northwest Quarter (NW1/4) of Section Six (6), Township One Hundred Nine (109) North, Range Forty-nine (49) West of the 5th P.M.,

BROOKINGS COUNTY, SOUTH DAKOTA

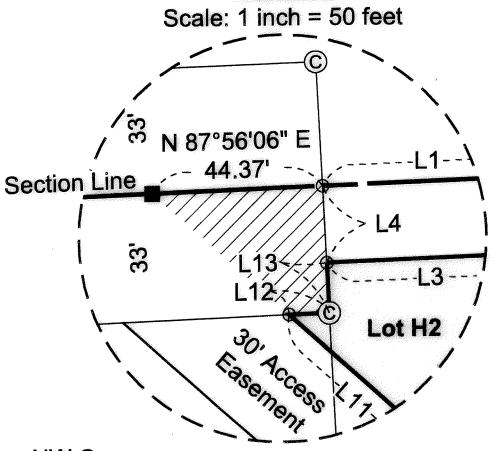
Showing a parcel of land to be acquired for highway purposes for construction Project EM 0295(45)130

Scale: 1 inch = 300 feet

LEGEND

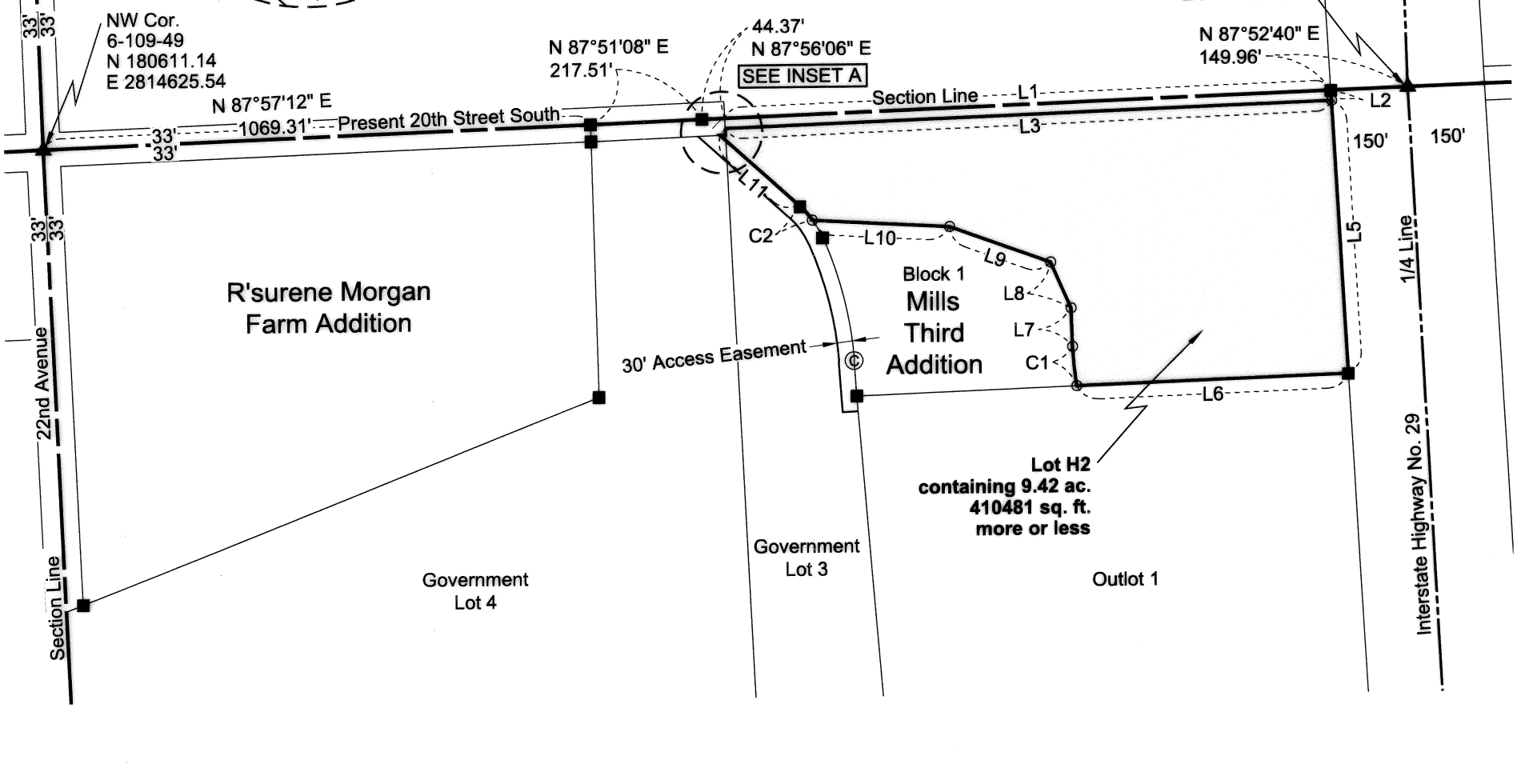
- ▨ = existing right of way
- ● = found R.O.W. corner
- ○ = set R.O.W. corner
- ▲ = found P.L.S.S. corner
- △ = set P.L.S.S. corner
- Ⓒ = calculated corner
- ■ = found property corner
- □ = set property corner
- (n) = not used for boundary location

INSET A
Scale: 1 inch = 50 feet



	Bearing	Length	Chord	Radius
L1	N 87°56'06" E	1181.36'		
L2	S 03°20'08" E	20.00'		
L3	S 87°56'06" W	1181.52'		
L4	N 02°51'37" W	20.00'		
L5	S 03°20'08" E	532.96'		
L6	S 87°55'52" W	529.00'		
C1	N 05°56'29" W	77.79'	77.73'	575.00'R
L7	N 02°03'56" W	76.36'		
L8	N 23°35'58" W	98.55'		
L9	N 70°05'26" W	208.80'		
L10	N 86°47'23" W	267.90'		
C2	N 42°08'55" W	39.48'	39.41'	187.00'L
L11	N 48°15'30" W	204.31'		
L12	N 87°51'17" E	10.49'		
L13	N 02°51'37" W	12.92'		

Existing R.O.W.
containing 0.02 ac.
903 sq ft,
more or less



Note 1: The coordinates, bearings, distances and areas shown on this plat are based on the South Dakota State Plane Coordinate System Grid North - North Zone NAD 83/2011 epoch 2010.00 Geoid 18 SF 0.9999557940

Note 2: All monumentation will be set upon project completion.

Drawn By: JLU Date: 01/19/2021
Checked By: NWN Date: 05/13/2021

SURVEYOR'S CERTIFICATE

I, NATHAN W. NIELSON, Registered Land Surveyor, in and for the State of South Dakota, do hereby certify that as ordered by the South Dakota Department of Transportation the parcel of land as shown on this plat has been surveyed at my direction and under my control, and such parcel of land shall be hereafter known by the lot number designated herein. The location and dimensions of the parcel are shown on this plat.

In witness whereof, I have hereunto set my hand and seal this 13TH day of MAY, 20 21.

REGISTERED PROFESSIONAL LAND SURVEYOR
REG. NO. 9924
NATHAN W. NIELSON
SOUTH DAKOTA

Registered Land Surveyor
Registration No. 9924

OFFICE OF REGISTER OF DEEDS

State of South Dakota
County of _____ SS

Filed for record the _____ day of _____, A.D., 20 _____ at _____ M., and recorded in Book of Plats _____ on Page _____ therein.

_____ Register of Deeds by _____ Deputy

020V

023p

PARCEL 3X

PLAT OF LOT H1

in Block One (1), Mills Third Addition in Government Lots 3 and 4 of the Northwest Quarter (NW1/4) of Section Six (6), Township One Hundred Nine (109) North, Range Forty-nine (49) West of the 5th P.M.,

BROOKINGS COUNTY, SOUTH DAKOTA

Showing a parcel of land to be acquired for highway purposes for construction Project EM 0295(45)130

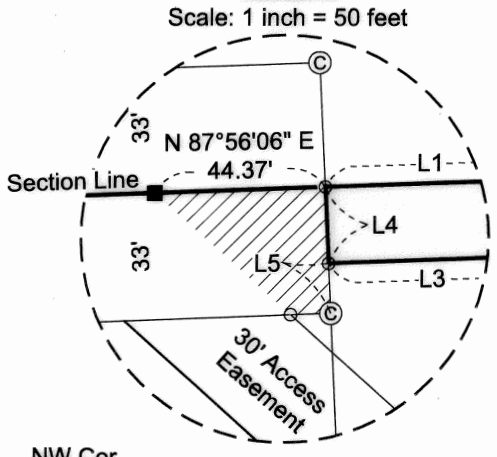
Scale: 1 inch = 300 feet

LEGEND

- ▨ = existing right of way
- ● = found R.O.W. corner
- ○ = set R.O.W. corner
- ▲ = found P.L.S.S. corner
- △ = set P.L.S.S. corner
- Ⓒ = calculated corner
- ■ = found property corner
- □ = set property corner
- (n) = not used for boundary location

INSET A

Scale: 1 inch = 50 feet



	Bearing	Length
L1	N 87°56'06" E	1181.36'
L2	S 03°20'08" E	20.00'
L3	S 87°56'06" W	1181.52'
L4	N 02°51'37" W	20.00'
L5	N 02°51'37" W	12.91'

Existing R.O.W.
containing 0.02 ac.
903 sq ft,
more or less

SW1/4

N1/4 Cor.
6-109-49
N 180707.21
E 2817286.30

Lot H1
containing 0.54 ac.
23629 sq. ft.
more or less

N 87°52'40" E
149.96'

NW Cor.
6-109-49
N 180611.14
E 2814625.54

N 87°51'08" E
217.51'

44.37'
N 87°56'06" E
SEE INSET A

N 87°57'12" E
1069.31'
Present 20th Street South

Section Line L1
L2
L3

33' 33'
150' 150'

Block 1
Mills Third Addition

R'surene Morgan
Farm Addition

30' Access Easement

22nd Avenue

Section Line

1/4 Line

Interstate Highway No. 29

Government
Lot 4

Government
Lot 3

Outlot 1

Note 1: The coordinates, bearings, distances and areas shown on this plat are based on the South Dakota State Plane Coordinate System Grid North - North Zone NAD 83/2011 epoch 2010.00 Geoid 18 SF 0.9999557940

Note 2: All monumentation will be set upon project completion.

Drawn By: JLU Date: 01/19/2021
Checked By: NWN Date: 05/13/2021

SURVEYOR'S CERTIFICATE

I, NATHAN W. NIELSON, Registered Land Surveyor, in and for the State of South Dakota, do hereby certify that as ordered by the South Dakota Department of Transportation the parcel of land as shown on this plat has been surveyed at my direction and under my control, and such parcel of land shall be hereafter known by the lot number designated herein. The location and dimensions of the parcel are shown on this plat.

In witness whereof, I have hereunto set my hand and seal this 13TH day of MAY, 20 21.

REGISTERED PROFESSIONAL LAND SURVEYOR
REG. NO. 9924
NATHAN W. NIELSON
SOUTH DAKOTA

Registered Land Surveyor
Registration No. 9924

OFFICE OF REGISTER OF DEEDS

State of South Dakota
County of _____ SS

Filed for record the _____ day of _____, A.D., 20 _____ at _____ M., and recorded in Book of Plats _____ on Page _____ therein.

_____ Register of Deeds by _____ Deputy

020V

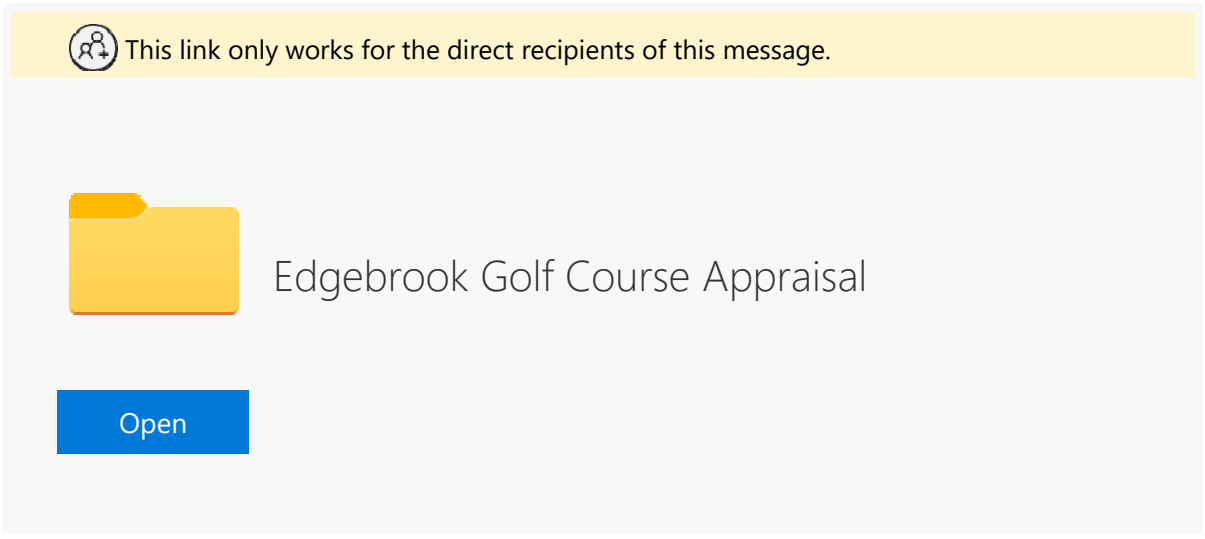
023p

Unruh, James

From: SharePoint Online <no-reply@sharepointonline.com>
Sent: Monday, April 14, 2025 9:01 AM
To: Unruh, James
Subject: Kerri.Richards successfully used the link to "Edgebrook Golf Course Appraisal"

Kerri.Richards has opened the link to "Edgebrook Golf Course Appraisal" that you sent to them!

If this is unexpected, you can manage your folder's sharing permissions.

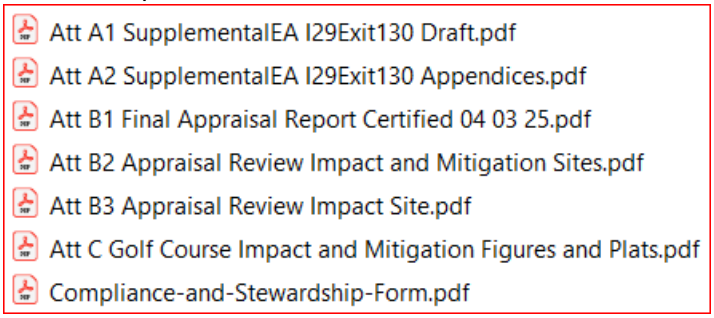


Unruh, James

From: Unruh, James
Sent: Monday, April 7, 2025 4:46 PM
To: 'Richards, Kerri'
Cc: Chad.Babcock; Baker, Becky
Subject: Brookings Interchange - Section 6(f) - Edgebrook Golf Course Compliance and Stewardship Form
Attachments: Att A1 SupplementalEA I29Exit130 Draft.pdf; Att C Golf Course Impact and Mitigation Figures and Plats.pdf; Compliance-and-Stewardship-Form.pdf; Att B1 Final Appraisal Report Certified 24.03 ROW 04 03 25.pdf; Att B2 Appraisal Review Impact and Mitigation Sites.pdf; Att B3 Appraisal Review Impact Site.pdf

As follow-up to our 2/26/25 video conference, we are submitting the completed LWCF Compliance and Stewardship (C&S) Form and attachments.

These are the files provided:



All files but Att. A2 are attached to this email.
Due to file size, you will receive a separate email with a link to our OneDrive site where you can download Att. A2.

Please let us know if anything is missing for your submittal to National Parks Service.

James Unruh, P.E.
HDR
101 S. Phillips Avenue, Suite 401
Sioux Falls, SD 57104
D 605.977.7766
james.unruh@hdrinc.com

hdrinc.com/follow-us

OMB Control No. 1024-0031
Expiration Date xx/31/2023

LWCF

National Park Service
U.S. Department of the Interior
State and Local Assistance Programs

Compliance and Stewardship (C&S) Form

Grant Name & Project Number(s): LCWF Grants 46-00166, 46-00304, and 46-01035

Park Name(s): Edgebrook Golf Course, Brookings South Dakota

LWCF Sponsor(s): South Dakota Game Fish and Parks and City of Brookings Parks and Recreation

The purpose of the C&S form is to provide information about Land and Water Conservation Fund (LWCF) compliance and stewardship proposals submitted for National Park Service (NPS) review. This form should be completed for any proposal that will impact a park or other recreation area that received LWCF assistance. Consultation with the NPS should occur before the form is completed. All proposals will be reviewed by the NPS in accordance with the LWCF Manual and other applicable federal laws, regulations, and guidance.

Generally, all compliance actions require the completion of all of Section 3.0 – Resource Information. Any exceptions are noted in the instructions for Section 3.0.

☒ Conversion of Use (fill out 1.0 with relevant sub-section(s), 3.0, and 4.0)
- ☐ All Conversions (1.1)
- ☒ Small Conversions (1.1 and 1.2)

☐ Other Compliance Actions Requiring NPS Review and Approval (fill out 2.0 with relevant sub-section(s), 3.0, and 4.0)
- ☐ Sponsor Change (2.1)
- ☐ Significant Change in Use (2.2)
- ☐ Temporary Non-Conforming Use (2.3)
- ☐ Sheltering (2.4)
- ☐ New Public Facility (2.5)

Brief Description of the Proposal:
Click here to enter text.

See Attachment A- Preliminary Draft Supplemental Environmental Assessment (SEA), Section 1.0 for a description of the proposal.

OMB Control No. 1024-0031
Expiration Date xx/31/2023

SECTION 1.0 CONVERSION OF USE

1.1 Required Information for All Conversions

Part A and B should be completed for all conversions, including full, partial, and small conversions.

A. Attachments checklist

☐ Transmittal letter from the SLO/ASLO that indicates the state's support for the proposal
☐ LWCF project amendment form
☐ Documentation of NPS concurrence with the existing LWCF boundary area and the proposed conversion footprint
☐ Documentation of NPS concurrence that the proposed replacement property meets LWCF requirements
■ Valuation documentation for conversion and replacement sites – either (a) appraisals and appraisal reviews OR (b) waiver valuations (as applicable) See Att B
■ NEPA documentation (as applicable) See Att A- SEA
■ NHPA documentation (as applicable) See Att A- Section 3.6 of SEA
■ Evidence of other federal law compliance as needed (i.e. ESA, CWA, etc.) See Att A- Section 3.0 of SEA
■ Intergovernmental review comments (as applicable) See Att A- Appendix A of SEA
☐ DNF
■ Maps:
- ☐ Signed and dated proposed LWCF boundary map(s) for the replacement site(s) and, for partial conversions, the original remaining park site
- ■ Site development plan for the proposed replacement property See Att C
- ■ Site plan for the remaining parkland (for partial conversions) See Att C
- ■ Location map depicting the locations of the conversion and the replacement properties and their relative location to one another See Att C

☐ Basicconversioninformation

Reproduce tables as needed for multiple sites.

CONVERSION SUMMARY & APPRAISAL/WAIVER VALUATION CERTIFICATION

Conversion site	Name(s) Expanded 20th St / 22nd Ave intersection corner in SW corner of the golf course.
	Converted acreage 8,396 square feet = 0.1927 acres
	Remaining acreages at site, if any 6,530,858 square feet = 149.93
	Fair market value $126,780
	Appraisal effective date April 3, 2025
	■ A State-certified Review Appraiser has reviewed the appraisal and has determined that it was prepared in conformity with the Uniform Appraisal Standards for Federal Land Acquisitions OR ☐ The State has prepared a waiver valuation for this property in conformity with 49 C.F.R. 24.102(c)(2)(ii)

Replacement site	Name(s) 20 foot wide x 1,181.44 foot long strip along the south edge of golf course
	Replacement acreage 23,629 square feet = 0.5424 acres
	Fair market value $279,295
	Appraisal effective date April 3, 2025
	■ A State-certified Review Appraiser has reviewed the appraisal and has determined that it was prepared in conformity with the Uniform Appraisal Standards for Federal Land Acquisitions OR ☐ The State has prepared a waiver valuation for this property in conformity with 49 C.F.R. 24.102(c)(2)(ii)

SLO/ASLO Signature Date

Name, Title, and Agency

1. A detailed explanation of the sponsor's need to convert the LWCF parkland including all efforts to consider other practical alternatives to this conversion, how they were evaluated, and the reasons they were not pursued.

2. An explanation of how the conversion is in accord with the goals and objectives of the current State Comprehensive Outdoor Recreation Plan (SCORP).

1.2 Additional Details for Small Conversions

The following section should be completed for small conversions only if you have been directed to do so after consultation with the NPS.

1. For the park land proposed for conversion, a detailed description including the following:
    a. Description of the area proposed for the conversion including the acreage to be converted and any acreage remaining. For determining the size of the conversion, consider not only the physical footprint of the activity precipitating the conversion, but how the precipitating activity will impact the entire LWCF park area. In many cases the size of the converted area is larger than the physical footprint. Include a description of the recreation resources, facilities, and recreation opportunities that will be impacted, displaced or lost due to the proposed conversion. For proposals to partially convert a LWCF park area, the remaining LWCF park land must remain recreationally viable and not be impacted by the activities that are precipitating the conversion. If it is anticipated that the precipitating activities will impact the remaining LWCF area, the proposed area for the conversion should be expanded to encompass all impacted park land.

b. Description of the community and population(s) served by the park, including users of the park and recreation uses.

2. For each proposed replacement site:
   a. Description of the site's physical characteristics and resource attributes with number and types of resources and features on the site, for example, 15 acres wetland, 2,000 feet beachfront, 50 acres forest, scenic views, 75 acres riparian, vacant lot, special habitat, any unique or special features, structures, recreation amenities, historic/cultural resources, hazardous materials/contamination history, restrictions, institutional controls, easements, rights-of-way, overhead/underground utilities including overhead wires, towers, etc.

   b. Identification of the owner of the replacement site and its recent history of use/function up to the present.

   c. Detailed explanation of how the proposed replacement site is of reasonably equivalent usefulness and location as the property being converted, including a description of the recreation needs that will be met and/or developed at the new replacement parks, population(s) to be served, and new outdoor recreation resources, facilities, and opportunities to be provided.

   d. Identification of owner and manager of the new replacement park.

   e. Name of the new replacement park. If the replacement park land will be added to an existing public park area, the existing area is expected to be included within the LWCF boundary. What is the name of the existing public park area? Is the existing park already LWCF-protected?

   f. Timeframe for completing development of the new outdoor recreation area(s) to replace the recreation opportunity lost per the terms of conversion approval and the date the replacement park(s) will be open to the public.

SECTION 2.0 OTHER COMPLIANCE ACTIONS FOR NPS REVIEW AND APPROVAL

2.1 Sponsor Change

A change in sponsor is an administrative change so the completion of Section 3.0 – Resource Information is not necessary.

A. Attachments checklist

☐ LWCF project amendment form
☐ LWCF boundary map with signature/date by the new sponsor and the state

B. Description

1. Why is the change in sponsor necessary?

2. What is the process and timeline for amending the state/local LWCF agreement?

3. What is the legal name of the proposed new sponsor? Are they an eligible sponsor for the LWCF program?

2.2 Significant Change in Use

A. Attachments checklist

☐ Transmittal letter or email from the SLO/ASLO that indicates the state's support for the proposal
☐ Map – site plan showing the location of the proposed use in relation to the LWCF boundary

B. Description

1. Description of the proposed changes and how they significantly contravene the original plans or intent for use of the site as documented in the LWCF grant agreement(s).

2. Explanation of the need for change in use and how the change is consistent with local plans and the goals and objectives of the current SCORP.

2.3 Temporary Non-Conforming Use

A. Attachments checklist

☐ Transmittal letter from the SLO/ASLO that indicates the state's support for the proposal
☐ Maps:
  ☐ Drawings and/or renderings of the proposed use
  ☐ Site plan showing the location of the proposed use in relation to the LWCF boundary

B. Description

1. Describe in detail the proposed temporary non-conforming use and all associated activities, why it is needed, and alternative locations that were considered and why they were not pursued.

2. Explain length of time needed for the temporary non-conforming use and why.

3. Describe the size of the LWCF area that will be affected by the temporary non-conforming use activities and expected impacts to public outdoor recreation areas, facilities and opportunities. Explain plans or efforts to keep the size of the area impacted to a minimum.

4. Describe any anticipated temporary/permanent impacts to the LWCF area and how the sponsor will mitigate them during and after the non-conforming use ceases.

2.4 Sheltering

An enclosed or sheltered recreation facility is defined as a facility that was originally assisted by LWCF or would be eligible for LWCF assistance if it was to be outdoors. LWCF assistance may be provided to shelter swimming pools and ice skating rinks only, when they are located in areas that meet specific cold climatic criteria. Project sponsors may seek approval to shelter or enclose other types of recreation facilities at their own expense, regardless of prevailing climatic conditions.

A. Attachments checklist

☐ Transmittal letter from the SLO/ASLO that indicates the state's support for the proposal
☐ Drawings and/or renderings of the proposed facility
☐ Site plan showing the location of the facility to be enclosed in relation to the LWCF boundary
☐ Provide a copy of the cold climatic data used to make the eligibility determination (if applicable; see manual).

B. Description

1. (If applicable) Explain how it was determined that the site meets the cold climate criteria described in the LWCF manual.

2. Describe the proposed sheltered facility, how it would operate, the recreation uses that could typically occur outdoors, and how the primary purpose of the sheltered facility will be recreation.

3. Explain how the sheltered facility would not substantially diminish the outdoor recreation values of the site including how the sheltered facility will be compatible with and significantly supportive of the outdoor recreation resources present and/or planned.

4. Explain how the sheltered facility will benefit the total park's outdoor recreation use.

5. Describe efforts provided to the public to review the proposal to shelter the facility and has local support.

6. Document that the sheltered facility will be under the control and tenure of the public agency that sponsors and administers the underlying park area.

2.5 New Public Facility

A. Attachments checklist

☐ Transmittal letter from the SLO/ASLO that indicates the state's support for the proposal, why it would result in a net benefit to outdoor recreation at the site, and the life expectancy of the facility.

☐ Maps:

- ☐Drawings and/or renderings of the proposed facility
- ☐ Site plan showing the location of the proposed use (and any surrounding impacted area) in relation to the LWCF boundary

B. Description

1. Describe the purpose and all proposed uses of the public facility such as types of programming, recreation activities, and special events including intended users of the new facility and any agency, organization, or other party to occupy the facility. Describe the interior and exterior of the facility, such as office space, meeting rooms, food/beverage area, residential/lodging area, classrooms, gyms, etc.

2. Explain how the facility will be compatible with and not diminish the outdoor recreation area. Explain how the facility and associated uses will significantly support and enhance existing and planned outdoor recreation resources and uses of the site, and how outdoor recreation use will remain the primary function of the site. (The public's outdoor recreation use must continue to be greater than that expected for any indoor use, unless the site is a single facility, such as a swimming pool, which virtually occupies the entire site.)

3. Explain the design and location alternatives considered for the public facility and why they were not pursued.

4. Explain who will own and/or operate and maintain the facility? Attach any 3rd party leases and operation and management agreements. When will the facility be open to the public? Will the facility ever be used for private functions and closed to the public? Explain any user or other fees that will be instituted, including the fee structure.

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Expiration Date xx/31/2023

SECTION 3.0 RESOURCE INFORMATION

Consultation with NPS regarding the NEPA pathway for a proposal should occur prior to completing this section. If has already been determined that the proposal will require an EA or EIS, you may go directly to the questions following Tables 1 and 2. The Environmental Resources Survey should be reproduced and completed for the conversion site(s) and the replacement site(s).

A. Environmental resources survey

The tables below serve as a record of the environmental resources present at the site, whether the proposed action is likely to have a significantly negative impact those resources, and whether further information is needed to determine the potential impact. Review the listed resources and identify any resources that may be significantly impacted by the action. The Environmental Resources Survey should be completed with professional input from resource experts and in consultation with relevant local, state, tribal, and federal governments, as appropriate.

Table 1 – For each resource indicate if positive impacts or negative impacts are anticipated to result from the action or if further information is needed to determine the potential impact.

No response indicated negligible impact

+ indicates positive impacts are anticipated to result from the action
- indicates negative impacts are anticipated to result from the action
? indicates further information is needed to determine the potential impact

Site Name:

	How will the project affect the following resources?	+	-	?
1	Air quality	☐	☐	☐
2	Circulation and transportation	☒	☐	☐
3	Climate	☐	☐	☐
4	Contamination or hazardous materials even if remediated	☐	☐	☐
5	Endangered species: (listed or proposed threatened or endangered) including associated habitat	☐	☐	☐
6	Environmental justice: minority and low-income populations	☐	☐	☐
7	Geological resources: soils, bedrock, slopes, streambeds, landforms, etc.	☐	☐	☐
8	Historic or cultural resources	☐	☐	☐
9	Invasive species	☐	☐	☐
10	Land use plans or policies from other agencies including tribes	☐	☐	☐
11	Lightscapes especially night sky	☐	☐	☐
12	Migratory birds	☐	☐	☐
13	Recreation resources	☐	☒	☐
14	Socioeconomics: changes to tax base or competition with private sector	☐	☐	☐
15	Sound (noise impacts)	☐	☐	☐
16	Unique ecosystems, such as biosphere reserves, World Heritage sites, old growth forests, etc.	☐	☐	☐
17	Water quality and/or quantity	☐	☐	☐
18	Water: coastal barrier resources or coastal zones	☐	☐	☐
19	Water: marine and/or estuarine	☐	☐	☐
20	Water: stream flow characteristics	☐	☐	☐
21	Water: wetlands and floodplains	☐	☐	☐
22	Other important resources Explain:	☐	☐	☐

Table 2 – This is a list of mandatory impact criteria that preclude the use of a categorical exclusion. If you answer "yes" or "?" for any of the mandatory criteria, you must develop an EA or EIS regardless of your answers in table 1.

Site Name:

	Will your proposal:	Y	N	?
1	Have significant negative impacts on public health or safety?	☐	☒	☐
2	Have significant negative impacts on unique natural resource or geographic characteristics such as historic or cultural resources; park, recreation, or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands; floodplains; national monuments; migratory birds; and other ecologically significant or critical areas?	☐	☒	☐
3	Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources?	☐	☒	☐
4	Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?	☐	☒	☐
5	Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?	☐	☒	☐
6	Have a direct relationship to other actions with individually insignificant but cumulatively significant environmental effects?	☐	☒	☐
7	Have significant adverse effects on properties listed or eligible for listing in the National Register of Historic Places as determined by NPS?	☐	☒	☐
8	Have significant negative impacts to species listed, or proposed to be listed, on the List of Endangered or Threatened Species or have significant impacts on designated critical habitat for these species?	☐	☒	☐
9	Violate a federal law, or a state, local, or tribal law or requirement imposed for the protection of the environment?	☐	☒	☐
10	Have a disproportionately high and adverse effect on low income or minority populations (EO 12898)?	☐	☒	☐
11	Limit access to and ceremonial use of Indian sacred sites on federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites?	☐	☒	☐
12	Contribute to the introduction, continued existence, or spread of noxious weeds or nonnative invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species?	☐	☒	☐

1. Have there been any previous NEPA/SEPA documents prepared that are relevant to this proposal or this specific site?
   a. ☐ No
   b. ■ Yes – Attach and summarize findings and include page number references below See Att A SEA- Section 1.0

2. Explain any negative or unknown impacts identified in Table 1 of the Environmental Resources Survey or any boxes marked "yes" in Table 2 (mandatory criteria).

3. How was the information in the tables derived and what sources of data were used to justify the impact selection?

4. Who contributed to filling out the Environmental Resources Survey (include name, title, agency) and what qualifications do they have that provide the necessary resource expertise to determine impact significance?

5. List all required federal, state, and local permits/approvals needed for the proposal and explain their purpose and status. FHWA/SDDOT Supplemental EA, General Construction NPDES

NEPA Pathway Recommendation

Attach documentation of NPS concurrence with the recommended NEPA Pathway

☐ This proposal qualifies for a Categorical Exclusion (CE). List: _____

■ This proposal requires an Environmental Assessment (EA), which is attached and has been produced in accordance with the LWCF Manual See Att A Preliminary Draft SEA

☐ This proposal may require an Environmental Impact Statement (EIS)

B. Cultural and historic resources review

Have there been any previous cultural and/or historic resource surveys completed that included this site within the area of potential effect that was assessed?

☐ No – Describe any construction planned as a result of this project that will extend beyond the pre-existing disturbance area (including surface area and depth).

■ Yes – Attach survey and summarize findings and include page number references below. See Att A Section 3.6 of the Preliminary Draft EA, SHPO Concurrence has been completed.

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Expiration Date xx/31/2023

NOTICES

Paperwork Reduction Act Statement

In accordance with the Paperwork Reduction Act (44 U.S.C. 3501), please note the following. This information collection is authorized by the Land and Water Conservation Fund Act of 1965 (54 U.S.C. 200301 et. seq.). Your response is required to obtain or retain a benefit. We use this information to obtain descriptive and environmental information about the proposal. We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid Office of Management and Budget control number. OMB has assigned control number 1024-0031 to this collection.

Estimated Burden Statement

Completion times vary widely depending on the use of the form. We estimate that the average completion time for this form is 16 hours for most stewardship requests, and 92.5 hours for a conversion of use (although a difficult conversion can take up to 500 hours), including the time necessary to read, gather data, review instructions, and complete the form. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Information Collection Officer, National Park Service, 12201 Sunrise Valley Drive, MS-242 Rm. 2C114, Reston, VA 20192. Please do not send your completed form to this address.

From: Babcock, Chad
To: Unruh, James; Richards, Kerri; Baker, Becky
Subject: RE: Brookings Interchange- Section 6(f)
Date: Friday, May 23, 2025 1:34:23 PM
Attachments: image003.png
image004.png
image005.png

Good afternoon,

HDR completed the original Environmental Assessment and the Supplemental per a work order w/ SDDOT who acts as a lead project proponent for FHWA. The primary programmatic agreements that SDDOT & FWHA have in place that apply to this project are our PAs w/ SHPO/ACHP & USFWS – SD Field Office.

This project will have a *no effect* on Threatened and Endangered species but was coordinated in accordance w/ our 2008 Biological Opinion w/ USFWS – SD Field Office.

A Section 106 *No Historic Properties Affected* determination has been made for this project and was coordinated according to our FHWA/SDDOT/SHPO/ACHP Programmatic Agreement.

Our PAs are available on our website at: https://dot.sd.gov/doing-business/environmental/agreements/.

Chad Babcock
Environmental Manager | South Dakota Department of Transportation
Better Lives Through Better Transportation
700 E. Broadway Ave, Pierre SD 57501
O: 605.773.3721 | C: 605.321.1953 | dot.sd.gov

From: Unruh, James <james.unruh@hdrinc.com>
Sent: Friday, May 23, 2025 11:06 AM
To: Richards, Kerri <Kerri.Richards@state.sd.us>; Baker, Becky <rebecca.baker@hdrinc.com>
Cc: Babcock, Chad <Chad.Babcock@state.sd.us>
Subject: RE: [EXT] Brookings Interchange- Section 6(f)

Kerri,
Becky is not in the office today.
See response in *blue italic text*.

In general, it appears that you are not receiving the files that we have recently provided to you.

If that is the case, we will attempt to send them again.

James Unruh, P.E.
D 605.977.7766

hdrinc.com/follow-us

From: Richards, Kerri <Kerri.Richards@state.sd.us>
Sent: Friday, May 23, 2025 9:45 AM
To: Baker, Becky <rebecca.baker@hdrinc.com>
Cc: Unruh, James <james.unruh@hdrinc.com>; Babcock, Chad <Chad.Babcock@state.sd.us>
Subject: RE: Brookings Interchange- Section 6(f)

Yes – I actually discussed that with the LWCF team at NPS earlier this week and hadn't gotten a chance to respond to you yet. She mentioned that this will shorten the timeline.

We also discussed the Yellow Book Appraisal. She mentioned that she was only seeing the property that will be converted as part of the appraisal. Is there information on the replacement property as well?
Section 2 (pages 68 to 78) of the Yellow Book Appraisal (file name: Att B1 Final Appraisal Report Certified 04 03 25.pdf) covers the replacement property.
Section 3 (pages 79 to 87) covers the acquisition property.
Please verify that NPS is looking at the correct file that was provided via a 4/7/25 email.

She also had a couple questions for the DOT – would you have a final EA or and CE or FONSI that you wrote or are working on that you could share? And do you have any programmatic agreements that you are using for this conversion?
A Supplemental Environmental Assessment is being prepared with a target approval date of 5/30/25. We submitted the latest (5/8/25) draft version to you via a link in a 5/16/25 email. Again, please verify that you have the file that has been provided (file name: 20250508_SupplementalEA_I-29Exit130_reduced.pdf).
The target FONSI date is 7/15/25.
From our understanding, we are not utilizing a Programmatic Agreement for this conversion.

Let me know! Thanks!

Kerri Richards | South Dakota Game, Fish and Parks

From: Baker, Becky <Rebecca.Baker@hdrinc.com>
Sent: Wednesday, May 21, 2025 8:17 PM
To: Richards, Kerri <Kerri.Richards@state.sd.us>

Cc: Unruh, James <james.unruh@hdrinc.com>; Babcock, Chad <Chad.Babcock@state.sd.us>
Subject: RE: [EXT] Brookings Interchange- Section 6(f)

Hi Kerri,

The project team met today, and the team had a clarification that might help with the NPS NEPA. NPS noted that tribal coordination was needed for the replacement property. Tribal coordination was completed for this area within the 2020 EA, please see the attached file. One response was received from Lower Brule, and they noted no comment.

Does this meet the Tribal Coordination that NPS was going to do? Please let me know if I can help in any other way.

Thanks!
Becky Baker
D 605.782.8189 **M** 605.690.2190

hdrinc.com/follow-us

From: Baker, Becky <rebecca.baker@hdrinc.com>
Sent: Monday, May 19, 2025 1:39 PM
To: Richards, Kerri <Kerri.Richards@state.sd.us>
Cc: Unruh, James <james.unruh@hdrinc.com>; Babcock, Chad <Chad.Babcock@state.sd.us>
Subject: RE: Brookings Interchange- Section 6(f)

Thank you, Kerri!

Do you know if they are also doing NEPA on the replacement property?

Response to your question: Yes, the replacement property is included within the SEA that FHWA would approve. The latest version provided to you discusses the coordination and NEPA completed for the replacement property within Section ***3.7.1.2 Revised Build Alternative*.** I have tried to attach it- can you please let me know if you receive this email since it is a larger file.

Thanks!
Becky Baker
D 605.782.8189 **M** 605.690.2190

hdrinc.com/follow-us

From: Richards, Kerri <Kerri.Richards@state.sd.us>
Sent: Monday, May 19, 2025 11:23 AM
To: Baker, Becky <rebecca.baker@hdrinc.com>

Cc: Unruh, James <james.unruh@hdrinc.com>; Babcock, Chad <Chad.Babcock@state.sd.us>
Subject: RE: Brookings Interchange- Section 6(f)

Becky and all –

Below are the answers from NPS on your questions.

1. What is the timeline of NPS review and approval? I appreciate any feedback you can provide. The project is moving forward with the goal to be in construction in July of this year, so we are working to go through the final review steps of the SEA and go into public availability.

As far as NPS is concerned, it is acceptable if the construction happens before we are finished with our conversion paperwork. NPS will need to submit a Tribal Consultation package for the replacement land only, and this has not started yet, so a rough estimate would be at least another 60-90 days before we can sign the new LWCF amendment, making the conversion official.

2. Is SDGFP and NPS aware that the Section 6(f) approval is a commitment with the SEA, that we will not wait for approval to proceed with public availability? We wanted to note that we would like to proceed with the SEA into public availability concurrently with NPS review of Section 6(f) unless they are able to approve by May 28th.

We will not be able to approve by May 28th, but I do not see any issues with the proposed LWCF conversion. We just need more time to complete our review and to coordinate more with SDGFP.

3. How will NPS meet their NEPA requirement? We are assuming that NPS is adopting the NEPA and regulatory coordination completed for the project, through the FHWA NEPA action. Please let us know if this assumption is correct, and if you need anything else. We have updated the SEA and the most recent version is here: BrookingsInterchange_Transfer

NPS will adopt the NEPA completed by FHWA for the converted property. Do you know if they are also doing NEPA on the replacement property?

Kerri Richards | South Dakota Game, Fish and Parks

From: Baker, Becky <Rebecca.Baker@hdrinc.com>
Sent: Friday, May 16, 2025 12:46 PM

To: Richards, Kerri <Kerri.Richards@state.sd.us>
Cc: Unruh, James <james.unruh@hdrinc.com>; Babcock, Chad <Chad.Babcock@state.sd.us>
Subject: RE: [EXT] Brookings Interchange- Section 6(f)

Kerri,

We met with FHWA yesterday to discuss the status of the Supplemental Environmental Assessment (SEA) and I have a few follow up questions that I hoped you can help me with.

1. What is the timeline of NPS review and approval? I appreciate any feedback you can provide. The project is moving forward with the goal to be in construction in July of this year, so we are working to go through the final review steps of the SEA and go into public availability.
2. Is SDGFP and NPS aware that the Section 6(f) approval is a commitment with the SEA, that we will not wait for approval to proceed with public availability? We wanted to note that we would like to proceed with the SEA into public availability concurrently with NPS review of Section 6(f) unless they are able to approve by May 28th.
3. How will NPS meet their NEPA requirement? We are assuming that NPS is adopting the NEPA and regulatory coordination completed for the project, through the FHWA NEPA action. Please let us know if this assumption is correct, and if you need anything else. We have updated the SEA and the most recent version is here: BrookingsInterchange_Transfer

Appreciate any information you can provide and if a discussion works better, please feel free to give me a call at 605.690.2190.

Thanks!
Becky Baker
D 605.782.8189 M 605.690.2190

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From: Baker, Becky
Sent: Friday, May 9, 2025 9:26 AM
To: Richards, Kerri <Kerri.Richards@state.sd.us>
Cc: Unruh, James <james.unruh@hdrinc.com>; Babcock, Chad <Chad.Babcock@state.sd.us>
Subject: Brookings Interchange- Section 6(f)

Good morning,

I wanted to check back in on the status of NPS review and approval of the Conversion of Use for this project. Thanks for the recent discussion and update- you mentioned checking with the NPS person on how their review was going. Did you get any further information or update?

Please let us know if you or NPS needs anything further- appreciate it!

Thanks!

Becky Baker
Senior Environmental Project Manager

HDR
101 S. Phillips Ave., Suite 401
Sioux Falls, SD 57104
D 605.782.8189 **M** 605.690.2190
rebecca.baker@hdrinc.com

hdrinc.com/follow-us

APPENDIX D: DRAFT SECTION A

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	EM 0295(45)130	1	68

FILE: ...\01 (Title)
PLOTTING DATE: 04-14-2025

REV DATE:
INITIAL:

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

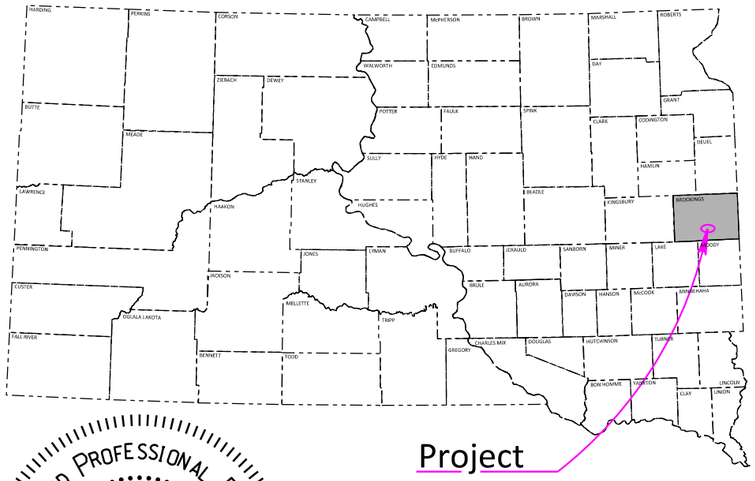
PROJECT EM 0295(45)130

20th Street South and 22nd Avenue South Intersection Expansion

BROOKINGS COUNTY

GRADING, CURB & GUTTER, STORM SEWER, PCC/AC PAVEMENT,
SIDEWALK, PAVEMENT MARKING, SIGNALS, LIGHTING, PERMANENT SIGNING

PCN 0A3L



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 5524
JAMES H. UNRUH
SOUTH DAKOTA
4-14-25

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 8324
LANCE R. MCQUEEN
SOUTH DAKOTA
4-14-25

DESIGN DESIGNATION

	20TH STREET S - 22ND AVE TO I-29	22ND AVE
AADT (2024)	5,000	7,400
AADT (2050)	15,000	15,500
D (P.M. Peak)	10%	10%
DHV (2050)	1,595	1,660
T DHV	4%	3%
T ADT	4%	3%
V	40	40

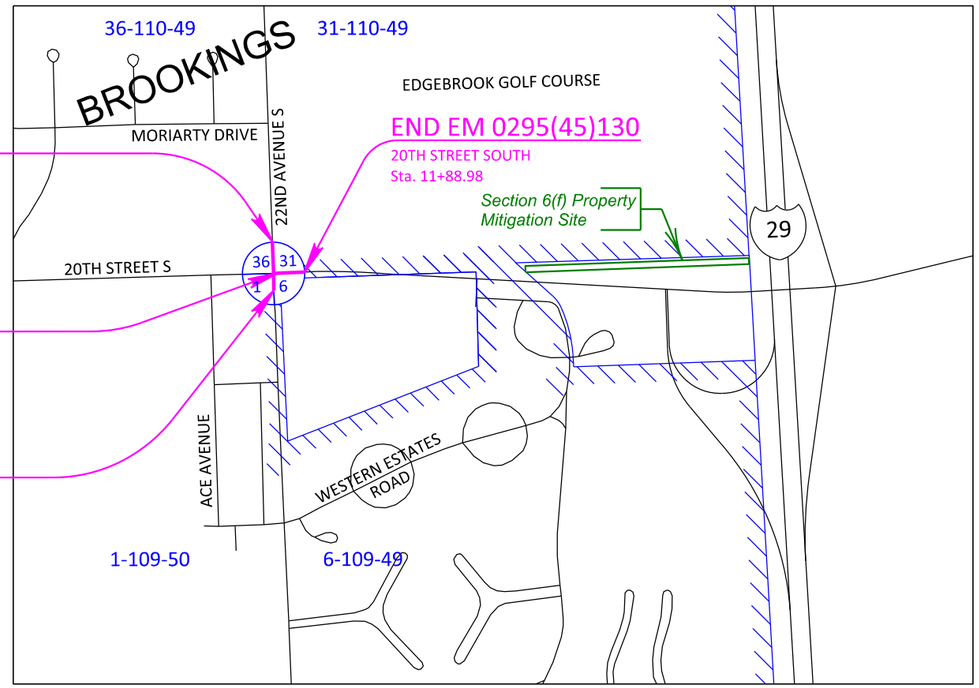
STORM WATER PERMIT

Major Stream: Medary Creek, Big Sioux River
Area Disturbed: 0.37 Acres
Total Project Area: 0.54 Acres
Approx. Begin Lat/Long: 44.2824, -96.7683

END EM 0295(45)130
22ND AVENUE SOUTH
Sta. 507+49.47

BEGIN EM 0295(45)130
20TH STREET SOUTH
Sta. 10+45.79

BEGIN EM 0295(45)130
22ND AVENUE SOUTH
Sta. 504+90.60



20th Street South Gross Length	143.19	Feet	0.027	Miles
22nd Avenue South Road Gross Length	258.87	Feet	0.049	Miles
Total Net Length	402.06	Feet	0.076	Miles

LIST OF SHEETS

ENVIRONMENTAL COMMITMENTS

This project (PCN 03AL) is a subsequent phase to PCN 020V for which a FONSI was approved on 1.22.2021. A Supplemental EA has been prepared and approved for PCN 03AL.

The SDDOT is committed to protecting the environment and uses Environmental Commitments as a communication tool for the Engineer and Contractor to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. During construction, the Project Engineer will verify that the Contractor has met Environmental Commitment requirements. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office.

Additional guidance on SDDOT's Environmental Commitments can be accessed through the Environmental Procedures Manual found at: <https://dot.sd.gov/media/documents/EnvironmentalProceduresManual.pdf >

For questions regarding change orders in the field that may have an effect on an Environmental Commitment, the Project Engineer will contact the Environmental Engineer at 605-773-3180 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

Once construction is complete, the Project Engineer will review all environmental commitments for the project and document their completion.

COMMITMENT C: WATER SOURCE

The Contractor will not withdraw water with equipment previously used outside the State of South Dakota or previously used in aquatic invasive species (AIS) positive waters within South Dakota without prior approval from the SDDOT Environmental Office. To prevent and control the introduction and spread of invasive species into the project vicinity, all equipment will be power washed with hot water (≥140 °F) and completely dried for a minimum of 7 days prior to subsequent use. South Dakota administrative rule 41:10:04:02 forbids the possession and transport of AIS; therefore, all attached dirt, mud, debris and vegetation must be removed and all compartments and tanks capable of holding standing water must be drained. This includes, but is not limited to, all equipment, pumps, lines, hoses and holding tanks.

Action Taken/Required:

The Contractor will obtain the necessary permits from the regulatory agencies such as the South Dakota Department of Agriculture and Natural Resources (DANR) and the United States Army Corps of Engineers (USACE) prior to water extraction activities.

Additional information and mapping of water sources impacted by Aquatic Invasive Species in South Dakota can be accessed at:
< https://sdleastwanted.sd.gov/maps/default.aspx>

< South Dakota Administrative Rule 41:10:04 Aquatic Invasive Species: https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04 >

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor will furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition debris may not be disposed of within the Public ROW.

The waste disposal site(s) will be managed and reclaimed in accordance with the following from the General Permit for Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Agriculture and Natural Resources.

The waste disposal site(s) will not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Environmental Office and the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements will apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials will be buried in a trench separate from wood debris. The final cover over the construction and/or demolition debris will consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW will be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor will control the access to waste disposal sites not within the Public ROW with fences, gates, and placement of a sign or signs at the entrance to the site stating, "No Dumping Allowed".

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period not to exceed the duration of the project. Prior to project completion, the waste will be removed from view of the ROW or buried, and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.
Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) will be incidental to the various contract items.

COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historic Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require a cultural resource review prior to scheduling the pre-construction meeting. This work includes but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor will arrange and pay for a record search and when necessary, a cultural resource survey. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review if the site was previously surveyed; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor will provide ARC with the following: a topographical map or aerial view in which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities within 100 feet of the inadvertent discovery will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office, who will contact the appropriate SHPO/THPO within 48 hours of the discovery to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor will not utilize a site known or suspected of having contaminated soil or water. The Contractor will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COMMITMENT M: SECTION 4(f)/6(f) RESOURCES

COMMITMENT M1: SECTION 4(f) PROPERTY

A Section 4(f) Evaluation concluded there are no feasible and prudent alternatives to avoiding Section 4(f) property located within the project.

Station	Section 4(f) Property
22nd Avenue 506+20 to 507+60 R	Allyn Frerichs Trail
10+00 to 37+00 L	Edgebrook Golf Course

Action Taken/Required:

The following measures are required to minimize harm to the above Section 4(f) property:

A trail detour will be provided for both the north and south of 20th Street trail segments. Appropriate signage will be installed to alert users of the Allyn Frerichs Trail of construction activities, access restrictions or closures, and to direct users to secondary access points. See the Pedestrian Detour Layout plan sheet.

The Contractor is not permitted to stage equipment or materials within the Allyn Frerichs Trail or the Edgebrook Golf Course.

The land being used will be fully restored and returned to a condition which is at least as good as that which existed prior to the project. Revegetation and landscaping within the temporary grading areas will occur.

The Contractor will notify the Project Engineer if additional easement is needed to complete the work adjacent to any Section 4(f) property. The Project Engineer will obtain an appropriate course of action from the Environmental Office before proceeding with construction activities that affect any Section 4(f) property.

COMMITIMENT M2: SECTION 6(f) PROPERTY

South Dakota Department of Game, Fish and Parks concurrence has been obtained for project impacts to the following resource acquired and developed through a Land and Water Conservation Fund grant.

Station	Section 6(f) Property
22nd Ave 506+20 to 507+60 R	Edgebrook Golf Course

Action Taken/Required:

The impacted area of the Edgebrook Golf Course in the northeast quadrant of the 20th Street / 22nd Avenue intersection is being mitigated by replacement property of equal or greater usefulness and value along the south edge of the golf course approximately 1,500 feet east of the intersection.

The Contractor is not permitted to stage equipment or materials within the Edgebrook Golf Course.

The Contractor will notify the Project Engineer if additional easement is needed to complete the work adjacent to any Section 6(f) property. The Project Engineer will obtain an appropriate course of action from the Environmental Office before proceeding with construction activities that affect any Section 6(f) property.

Pedestrian Detour Layout

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	EM 0295(45)130	19	68

FILE: ...\19 traffic control detour.dgn
PLOTTING DATE: 04-14-2025

REV DATE:
INITIAL:

SCALE IN FEET
0 75 150

LEGEND	
KEY	ITEM
	DETOUR ROUTE
Front of Sign / Sign Post	SIGN LOCATION / ORIENTATION
Front of Sign / Sign Post	DOUBLE POST - SIGN LOCATION / ORIENTATION
	LONGITUDINAL PEDESTRIAN BARRICADE
	CONSTRUCTED IN CURRENT PHASE

MORIARTY DRIVE

20TH STREET

22ND AVENUE

DETOUR

SIDEWALK CLOSED

PEDESTRIAN DETOUR ROUTE TO BE PLACED ONTO THE CLOSED LANE OF TRAFFIC, PARALLEL TO THE CONSTRUCTION WORK AREA. INSTALL LONGITUDINAL PEDESTRIAN BARRIER ALONG BOTH SIDES OF THE DETOUR ROUTE THAT IS ALONG THE CONSTRUCTION WORK AREA.

INSTALL TEMPORARY CURB RAMP

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 8324
LANCE R. MCQUEEN
SOUTH DAKOTA
4-14-25