

RESOLUTION 2023 - 14

**A RESOLUTION TO APPROVE AND ADOPT
THE BIG HORN AVENUE CORRIDOR STUDY FINAL REPORT**

WHEREAS, the City Council for the City of Cody recognizes the importance of performing long-term planning and prioritization of the needs for infrastructure investment in the City's streets and pedestrian facilities to ensure that safe and effective mobility options are provided to its residents; and

WHEREAS, the City of Cody recognized the need to analyze and study the Big Horn Avenue Corridor to understand the long-term traffic and pedestrian improvements that will be required in the coming years; and

WHEREAS, the City of Cody has worked in partnership with the Wyoming Department of Transportation (WYDOT), Park County Government, and the Park County School District #6 (PCSD#6) during the course of the corridor study; and

WHEREAS, the Cody Urban Systems and Traffic Committee (CUSTC), comprised of City of Cody, WYDOT, Park County, PCSD#6, and general public appointed members, was designated as the "steering committee" for the corridor study; and

WHEREAS, The CUSTC steering committee has held public meetings, informational open houses, and conducted public surveys to gather input and feedback about the Big Horn Avenue Corridor and the challenges faced by motorists and pedestrians alike; and

WHEREAS, The CUSTC has reviewed the Big Horn Avenue Corridor Study Final Report and recommended approval and adoption of the report by the Cody City Council.

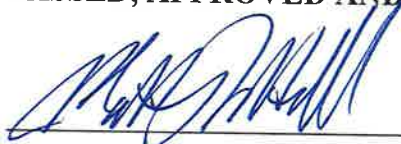
NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Cody, Wyoming, the following:

THAT the "Big Horn Avenue Corridor Study Final Report" is hereby approved and adopted; and

THAT the Big Horn Avenue Corridor Study will be used as a basis for future capital improvement project planning and programming; and

THAT the Big Horn Avenue Corridor Study will be used as guidance for land development application review and approval to determine streets and pedestrian infrastructure needs of each development application.

PASSED, APPROVED AND ADOPTED this 15th day of August, 2023.



Matt Hall, Mayor, City of Cody



ATTEST:



Cindy Baker, Administrative Services Director

MEETING DATE: AUGUST 15, 2023

DEPARTMENT: PUBLIC WORKS – STREETS

PREPARED BY: PHILLIP M. BOWMAN, P.E.

PRESENTED BY: PHILLIP M. BOWMAN, P.E.



AGENDA ITEM SUMMARY REPORT

Approval of Resolution 2023-14 to approve and adopt the Big Horn Avenue Corridor Study Final Report

ACTION TO BE TAKEN

Consider approval and adoption of the Big Horn Avenue Corridor Study Final Report, and authorize the Mayor to sign Resolution 2023-14.

SUMMARY OF INFORMATION

The City of Cody applied for and secured grant funding from the Wyoming Department of Transportation in May 2021 to complete the Big Horn Avenue Corridor Study (Study). The intent of the Study was to evaluate numerous factors along the corridor including future growth, future traffic levels, speed, intersection traffic signal warrants, non-vehicular facilities (pedestrian and bicycle), and pedestrian crossing improvements. City staff performed a Qualifications Based Selection (QBS) process in 2021 to select an engineering consultant for the Study, and Stantec Consulting Services Inc. (Stantec) was placed under contract to complete the project in December 2021.

The Cody Urban Systems and Traffic Committee (CUSTC) was designated as the “steering committee” for the Study, with CUSTC members meeting frequently with Stantec staff throughout 2022 and early 2023 to provide input and feedback at key milestones during the progress of work. CUSTC members and Stantec staff also conducted an on-line public survey, held two on-line open house meetings, and one in-person open house meeting to solicit feedback and comments from the public on the alternatives evaluated and recommendations made in the Study.

The Big Horn Avenue Corridor Study Final Report was presented to the CUSTC members by Stantec in early 2023 for final review and consideration. The CUSTC met on May 1, 2023 to discuss the Final Report, and voted at that meeting to recommend to the Cody City Council that the Final Report be approved and adopted.

Resolution 2024-14 will approve and adopt the Study Final Report, and will allow City staff to utilize the Study for Capital Improvement Program (CIP) project planning and budgeting, land development application review and recommendations, and future coordination with WYDOT for projects along the corridor.

FISCAL IMPACT

The Study identifies specific projects for future capital investment along the corridor, and will be used as a guidance document for future budget proposals and grant applications. There are no specific fiscal impacts created by approving and adopting the Study.

ATTACHMENTS

1. Resolution 2023-14
2. Big Horn Avenue Corridor Study Final Report – Table of Contents and Executive Summary

AGENDA ITEM NO. _____



Big Horn Avenue Corridor Study

Corridor Study for Big Horn Avenue/
US 14A in Cody, WY from Belfry
Highway to Beacon Hill Road

March 21, 2023

Prepared for:
City of Cody
1338 Rumsey Avenue
Cody, WY 82414

Prepared by:
Stantec Consulting Services Inc.
2 North Main Street, Suite 401
Sheridan, WY 82801



BIG HORN AVENUE CORRIDOR STUDY

The conclusions in the Report titled Big Horn Avenue Corridor Study are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from the City of Cody (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided to applicable authorities having jurisdiction and others for whom the Client is responsible, Stantec does not warrant the services to any third party. The report may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec's discretion.


Prepared by  Digitally signed by Capets, Adam
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Adam Capets, PE

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Jill Rosselott, PE

I certify this document has been prepared by me or under my immediate supervision, that I have experience and training in the field of traffic and transportation engineering, that I am a registered Professional Engineer (PE) with the State of Wyoming, and that I am a registered Professional Traffic Operations Engineer (PTOE) with the Transportation Professional Certification Board.

Approved by  Location: Cheyenne, Wyoming
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Benjamin Weaver, PE, PLS, PTOE

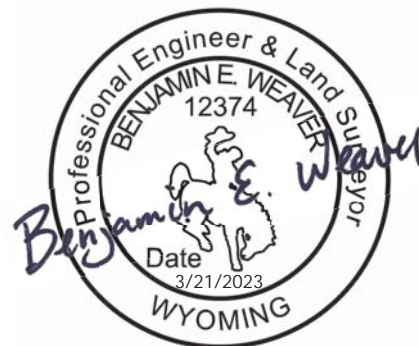


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Abbreviations

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
CUSTC	Cody Urban Systems and Traffic Committee
F&SI	Fatal and Serious Injury
HCM	Highway Capacity Manual
LOS	Level of Service
MUTCD	Manual on Uniform Traffic Control Devices
(H)MVMT	(Hundred) Million Vehicle Miles Traveled
PCSD 6	Park County School District 6
PHB	Pedestrian Hybrid Beacon
RM	Reference Marker
RRFB	Rectangular Rapid Flashing Beacon
TWLTL	Two-Way Left Turn Lane
VPD	Vehicles per Day
WYDOT	Wyoming Department of Transportation



Executive Summary

To identify and document vehicular safety and operational deficiencies, bicycle and pedestrian safety deficiencies, network gaps, and access density concerns, a 2.2-mile section of Big Horn Avenue was studied within Cody, Wyoming city limits. Figure A.1 shows the approximate limits of the study.

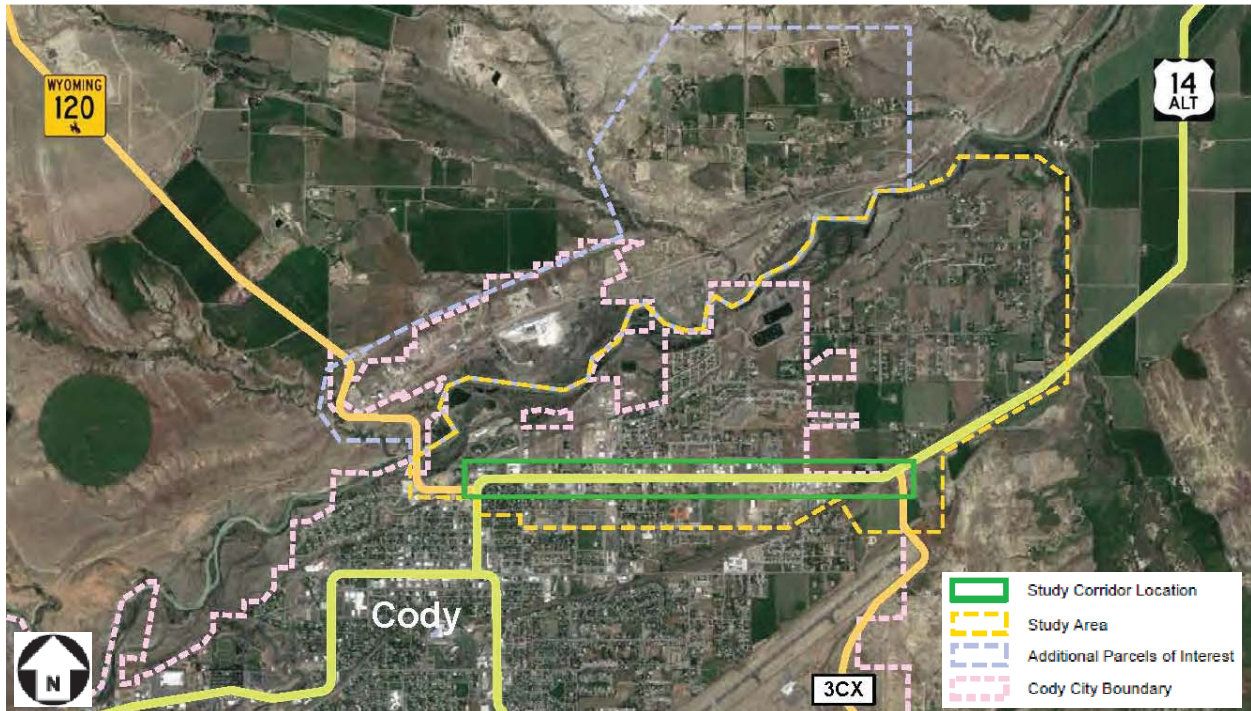


Figure A.1 – Big Horn Avenue Corridor Study Limits

The corridor contains 19 intersections with public streets. The following five major intersections were selected for more detailed analysis:

1. Big Horn Avenue & Belfry Highway/WY 120
2. Big Horn Avenue & Freedom Street
3. Big Horn Avenue & Robert Street
4. Big Horn Avenue & Cooper Lane West
5. Big Horn Avenue & Beacon Hill Road/Rd 3CX

The intersection of Big Horn Avenue and Blackburn Street was excluded from the analysis. WYDOT is proposing traffic signal control at the intersection. Design of the traffic signal is expected to begin in 2023.

Within the Big Horn Avenue Corridor Study, three key tasks were completed and summarized in the following report. These tasks included assessing existing conditions, conducting public engagement, and analyzing recommended improvements throughout the corridor.



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Stantec previously submitted a technical memorandum in June 2022 which summarized the existing conditions assessment of the Big Horn Avenue corridor. This was used to identify potential concerns and act as a baseline for future recommendations. Existing conditions that were obtained as part of this study included the following information:

- Corridor and Intersection Geometrics
- Access Density
- Traffic Volumes
- Crash Analysis
- Existing Pedestrian and Bicycle Facilities
- Land Use and Zoning
- Previous Studies

Traffic forecasts for the year 2050 were developed to assess the impact that city expansion and future development has on the proposed corridor improvements. The growth rates and patterns experienced on the corridor in the past 30 years were expected to similarly reflect the growth anticipated through 2050, thus the average growth rate of the corridor of 2.0% per year was selected and applied to all segments and adjoining streets. Historical 2019 AADTs and forecasted 2050 volumes are shown in Table A.1.

Segment	2019 Daily Volumes	2050 Daily Volumes
RM 0.44 (Belfry Highway) to 1.13 (Blackburn Street)	11,769	21,740
RM 1.13 (Blackburn Street) to 2.19 (Cooper Lane West)	10,495	19,390
RM 2.19 (Cooper Lane West) to 2.67 (Beacon Hill Road)	6,243	11,530
RM 2.67 (Beacon Hill Road) to 7.34 (County Road 2AB)*	7,114	13,140

**Data provided for reference only and is located outside study area*

To determine if traffic signal control is warranted at the major intersections mentioned above, a signal warrant analysis was completed. This analysis focused on Warrants 1, 2, 3, 7 and 8 of the MUTCD for all five intersections and Warrants 4 and 5 where applicable. A description of each warrant is shown below. Under existing volumes, none of the five intersections examined meet signal warrants, thus traffic signals are not recommended in the near-term. However based on forecasted volumes, it is estimated that intersections along the corridor may meet signal warrants beginning in 2029.

- Warrant 1 – Eight-Hour Vehicular Volume
- Warrant 2 – Four-Hour Vehicular Volume
- Warrant 3 – Peak Hour
- Warrant 4 – Pedestrian Volume



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- Warrant 5 – School Crossing
- Warrant 7 – Crash Experience
- Warrant 8 – Roadway Network

Delay and LOS (the quality of traffic flow based on delay per vehicle, rated A through F where F is the most congested) were used as measures for determining how the five major intersections operate. 2021 and 2050 models were developed using Synchro software given AM, Mid-day, and PM peak hour conditions. LOS results are based on thresholds derived in the HCM based on the average delay per vehicle. It was determined that all intersection movements performed at LOS C or better for the 2021 peak hour scenarios. In the 2050 peak hours, Belfry Highway and Beacon Hill Road movements performed at LOS F and Robert Street movements at LOS D during peak hours. Table A.2 shows a summary of the Synchro results for the existing conditions.

Table A.2 – Existing Configuration LOS Summary						
Intersection	Lowest LOS - 2021			Lowest LOS - 2050		
	AM	Mid	PM	AM	Mid	PM
Belfry Highway	C	C	C	F	F	F
Freedom Street	B	B	B	C	C	C
Robert Street	B	B	B	D	B	C
Cooper Lane West	B	B	B	C	B	B
Beacon Hill Road	C	B	C	F	D	F

LOS A-C: LOS D: LOS E: LOS F:

Existing crash data was utilized to assess safety along the corridor and to determine high crash probability areas. The most common vehicle crashes experienced on the corridor involved turning vehicles. These crashes were concentrated in areas with high access and intersection density and around adjacent businesses and land uses with high vehicle trip generation. The existing corridor configuration with a TWLTL and high access density creates many conflict points, which increases the likelihood of a vehicle collision caused by turning vehicles.

Crash rates were calculated for the corridor and were compared to the WYDOT statewide crash rates for similar urban principal arterial facilities between 2016 and 2020. The total crash rate along the corridor was shown to be 36% lower than the statewide average. Similarly, the F&SI crash rate was 52% lower than the statewide average. While both rates are lower than statewide, the crash rate is expected to increase as vehicle volumes increase on the corridor. Comparisons are shown in Table A.3.



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Table A.3 – Corridor Crash Rates, 2016 – 2020		
Segment	Total Crash Rate (crashes/MVMT)	F&SI Crash Rate (crashes/HMVMT)
RM 0.44 (Belfry Highway) to 1.13 (Blackburn Street)	1.820	0.000
RM 1.13 (Blackburn Street) to 2.19 (Cooper Lane West)	1.156	0.000
RM 2.19 (Cooper Lane West) to 2.67 (Beacon Hill Road)	2.648	18.265
Corridor Average	1.600	2.461
Wyoming Statewide Average, Urban Principal Arterial – Other	2.485	5.087

Recently, two bicycle related crashes (both in 2016, one between North Lane and 19th Street, one between Blackburn and A Streets) and one pedestrian crash (2021) were recorded along the corridor. Generally, the lack of signed/marked pedestrian crossings and minimal sidewalk buffer do not create safe conditions for pedestrians. Providing safe crossings in strategic locations can help mitigate future pedestrian crashes.

Three public engagement opportunities were conducted over the duration of the project. These opportunities allowed for the public to regularly provide feedback regarding existing concerns and proposed improvements. Surveys, interactive maps, and public meetings were all used as a means for obtaining input.

Based on the analysis completed in this report, an initial list of potential alternatives was created to present all improvement options. Viable improvements were chosen to be advanced into further analysis and discussion with the public. After all considerations were reviewed and analyzed, the following improvements are recommended for the corridor as a whole and for specific locations.

- Corridor Vehicle Speed Reduction: To reduce vehicle speeds, through lanes should be narrowed to 11 feet. In the near term, Big Horn Avenue should be restriped. This is anticipated to be completed in conjunction with resurfacing and ADA pedestrian ramp improvements while maintaining the existing curb-to-curb distance, which will cost approximately \$4,440,000. In the long term, the southern curb should be reconstructed to the north to narrow lanes and provide space for a raised shared-use path, which will cost approximately \$8,240,000. Along with the section modifications, the speed limit on Big Horn Avenue should be reduced to 30 mph. Radar speed indicators should be installed for westbound traffic entering Cody from Powell Highway.
- Corridor Crash Reduction Measures: To improve turning vehicle safety, it is recommended that any new access or existing access modification is consolidated into a joint access or moved to an adjacent side street if possible and meets WYDOT's Access Manual requirements. In the long term, raised medians should be considered as volumes approach the 24,000 VPD threshold, which will cost approximately \$3,140,000. Left turns and U-turns would only occur at major



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intersections, which may require signalization to accommodate increased volume. Enhanced lighting should be installed between 36th Street and Beacon Hill Road to reduce animal crashes.

- Pedestrian and Bicycle Crossings: To provide safe crossings for pedestrians and bicycles, a PHB crossing with median refuge should be installed on the west leg of the Freedom Street intersection as soon as possible and further explored on the east leg of the 19th Street intersection. The PHB crossing will cost approximately \$350,000. An RRFB crossing was tested in the interim to assess effects on safety and pedestrian volumes, however it was determined that the crossing showed safety concerns that may be more adequately addressed with a PHB. The crossings should be accompanied by advanced warning signage with overhead flashing beacons, and a 20-mph school zone should be implemented at Freedom Street as soon as it is warranted by WYDOT.
- Intersection Improvements: As development continues north and east of the corridor, the intersections with Belfry Highway, Robert Street, Cooper Lane West, and Beacon Hill Road will see increased turning volumes. Turning movement counts should be collected again around 2030 to reassess signal warrants. Once traffic signal warrants have been met, traffic signals should be considered at each of the four intersections and roundabouts should also be considered at Belfry Highway and Beacon Hill Road. Roundabouts may provide geometric and safety advantages over traffic signals. Adding control through signals (including at Blackburn) or roundabouts may also change driver behavior and expectations by creating stop conditions instead of an uninterrupted corridor where drivers are more focused on traveling through. Traffic signals will range in cost between approximately \$500,000 and \$750,000 depending on intersection complexity such as with Belfry Highway, while multi-lane roundabouts will cost approximately \$5,000,000.

Prior to signal installation, the Robert Street connection and realignment/new connection at Cooper Lane West should be completed to mitigate/eliminate the offset intersections with Freedom and Date Streets, respectively. These costs will range between approximately \$2,800,000 and \$3,750,000 depending on length of roadway being constructed. The PHB crossing at Freedom Street should be reevaluated and may be removed if a signal is constructed at Robert Street. The hardware may be reused at another crossing location.

