

Wyoming Boulevard Sidepath Study and Conceptual Design

Casper, WY

Prepared for:
Casper Area Metropolitan Planning Organization

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DN13-0397

FEHR  PEERS

Table of Contents

Chapter 1.	Introduction.....	1
Chapter 2.	Data Collection.....	3
2.1	GIS Data.....	3
2.2	Field Review.....	4
2.3	Trail Plans Review.....	4
Chapter 3.	Alternative Conceptual Designs.....	5
3.1	Option 1.....	6
3.1.1	Challenges and Constraints.....	6
3.1.2	Right-of-Way Considerations.....	8
3.2	Option 2.....	10
3.2.1	Challenges and Constraints.....	10
3.2.2	Right-of-Way Considerations.....	12
3.3	Option 3.....	14
3.4	Cost Estimates.....	15
Chapter 4.	Summary of Conceptual Designs.....	16



Appendices

Appendix A: Field Notes and Photo Log

Appendix B: Review of the Proposed On- and Off-Street Pedestrian and Bicycle Facilities

Appendix C: Conceptual Design Plan Set

List of Figures

Figure 1-1 Vicinity Map and Site Plan	2
Figure 3-1: Option 1 Sidepath Conceptual Cross-Section	6
Figure 3-2: Option 2 Sidepath Conceptual Cross-Section	10
Figure 3-3: Option 3 Sidepath Conceptual Cross-Section	14

List of Tables

Table 3-1: Right-of-Way Considerations for Option 1	9
Table 3-2: Right-of-Way Considerations for Option 2	13
Table 3-3: Estimated Cost for Alternative Designs.....	15
Table 4-1: Consumer Report Matrix.....	16



CHAPTER 1. INTRODUCTION

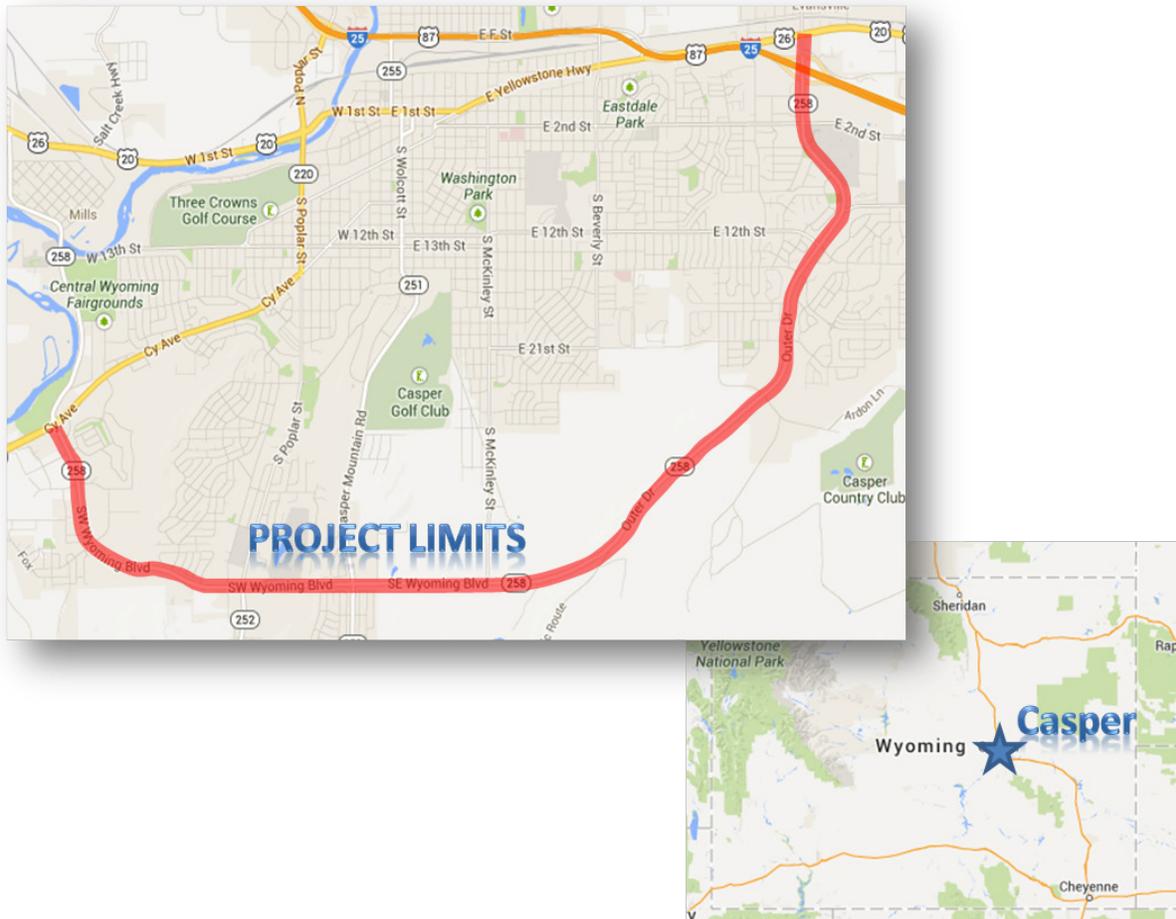
Jurisdictions across the nation, including Casper, are realizing the importance that pedestrian and bicycling infrastructure has on the quality of life and personal health of its residents. These facilities provide residents of all ages with a better choice of transportation whether commuting to work, traveling to and from school, or simply for recreational purposes. Planning for these facilities is only the first step in this process; designing facilities that provide the safety and comfort level for all age groups is the true challenge. It is realized that in order to make these facilities truly successful, the public's perception of safety and convenience play a big role.

Fehr & Peers has applied a safety and convenience approach to the feasibility assessment and conceptual design of the proposed sidepath options along Wyoming Boulevard in Casper, WY. The sidepath will travel from CY Avenue (West Casper) to Yellowstone Highway (East Casper) for a total of eight miles. **Figure 1-1** shows the site vicinity map. This document is intended to provide a summary of the analysis and the conceptual designs for the three design options. The study included the following tasks:

1. **Document Review and Data Collection** – Review and understand the existing plans and policies related to the proposed sidepath and conduct a field visit.
2. **Right-of-Way and Easement Assessment** - Collect GIS data from the Casper Area MPO on the location of ROW and documented easements.
3. **Conceptual Planning** – Evaluate the feasibility of constructing a multi-use path along Wyoming Boulevard.
4. **Cost Estimating** – Develop high-level cost estimate for each option.



Figure 1-1 Vicinity Map and Site Plan



CHAPTER 2. DATA COLLECTION

Prior to initiating the conceptual design of the sidepath options, various data were collected to establish an understanding of the existing conditions along the corridor and future projects that might influence the location of the path and types of connections to it. Data was collected from various sources:

- Casper Area MPO GIS – aerial photography, contours, and parcel boundaries
- Natrona County Assessor’s Office – property value information
- Field Visit – existing conditions, photo inventory, document potential challenges
- Trail Plan Review – potential future trails/parks and connections

The available parcel, right-of-way, and easement information was limited in some areas. In locations where property information was limited, the visible fence lines observed in the field and through aerial images were relied on to estimate the approximate right-of-way location.

All of the provided data was utilized to determine the most appropriate designs for each of the three alternative options.

2.1 GIS Data

The Casper Area MPO provided aerial photography, 2-foot contours, and parcel boundaries from their GIS database. It should be noted that the aerial photography is slightly outdated and did not include some of the newly constructed intersections, accesses, and businesses along the Wyoming Boulevard corridor and thus other mapping resources were utilized to supplement the provided aerials.

The contours and parcel boundaries were layered on top of the aerial photography to further understand the character and constraints of the sidepath alternative designs. Parcel lines are for information purposes only and serve to identify the potential right-of-way boundaries. Unfortunately the parcel information does not perfectly align with the fence/property lines shown on the aerials. Together the parcel lines, the fence lines shown on aerial mapping, and field verification were used to identify the approximate location of the right-of-way line. Thus the property impacts and associated costs discussed later in this report are approximate and will require further verification to truly understand the limits of impact.



2.2 Field Review

In order to document the existing conditions, challenges, and opportunities along the corridor, Fehr & Peers visited the site on April 10th, 2013. The entire corridor was driven twice and Fehr & Peers staff walked many portions of the roadway to take notes and photographs. This field visit provided great insight on the type of pedestrian/bicycle facility and potential conflict points that exist along Wyoming Boulevard. The field notes and photos are available in **Appendix A**.

2.3 Trail Plans Review

A review of the following bicycle and pedestrian facility plans was conducted to identify existing or proposed bicycle or pedestrian facilities located within the vicinity of our project limits that may require further evaluation of appropriate on- and off-street trail connections to the proposed Wyoming Boulevard sidepath.

- Casper Metropolitan Area Multi-Use Trail System Plan
- Garden Creek/Sedar Draw Conceptual Trails Design Study
- Morad Park Bypass plans

The review of these documents indicated that the majority of these on- and off-street facilities have not been implemented yet with the exception of the following:

- Soft-surface trail surrounding Yesness Park
- Unimproved portion of Casper Rail Trail Near Yellowstone Hwy
- Improved Long Path near Long Park
- Improved CY Avenue Path on the western end of the study area

The current status of the proposed on- and off-street pedestrian and bicycle facilities that have connections with Wyoming Boulevard are summarized in **Appendix B**. As the Casper Area Trails, Path, and Bikeway Plan (CATPBP) is developed, consideration should be given to incorporating these planned on- and off-street trail connections into future design plans for the Wyoming Boulevard sidepath.



CHAPTER 3. ALTERNATIVE CONCEPTUAL DESIGNS

The proposed sidepath will be a hard surface trail that extends the entire length of Wyoming Boulevard between CY Avenue and Yellowstone Highway. Conceptual designs were developed in AutoCAD on an aerial map base provided by the Casper Area MPO. The conceptual designs were based on information gathered during our document review task, the on-site field evaluation, guidance provided within the AASHTO Guide for the Development of Bicycle Facilities, private property and utility impacts, and likely capital cost considerations.

Initially, the three sidepath options included the following:

- Option 1. A 10-foot wide, detached, two-way multi-use path on one side of Wyoming Boulevard
- Option 2. An 8-10-foot, detached, one-way multi-use path on both sides of Wyoming Boulevard
- Option 3. A combination of detached and attached multi-use paths on both sides of Wyoming Boulevard

However, these options were modified to provide more feasible conceptual designs that took into account the existing topographic, utility, and right-of-way constraints. Based on discussions with the MPO staff, the original three sidepath options were modified to arrive at the following three proposed options:

- Option 1. A 10-foot two-way combo (detached/attached) sidepath along the north side of Wyoming Boulevard.
- Option 2. A 10-foot two-way combo (detached/attached) sidepath along the south side of Wyoming Boulevard.
- Option 3. A 10-foot one-way combo (detached/attached) sidepath along both sides of Wyoming Boulevard (this is essentially Option 1 and Option 2 combined).

The conceptual design alternatives (provided in **Appendix C**) identified the following issues:

- Potential cut/fill locations and need for retaining walls and railings
- Locations requiring new drainage or adjustments to existing drainage facilities
- Areas that may require removal of existing pedestrian sidewalk facilities
- Sensitive environmental areas that may require further study
- Right-of-way encroachments
- Utility and major sign structure impacts

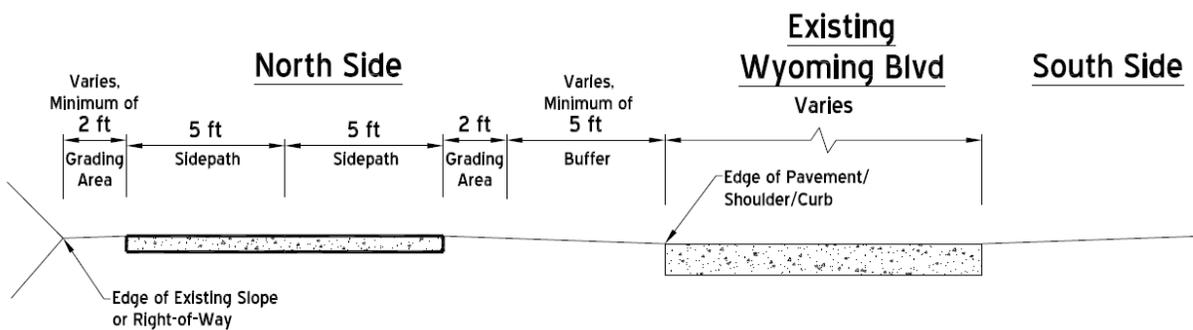


It should be noted that there are plans to widen Wyoming Boulevard to four lanes between Casper Mountain Road and 15th Street. This project is not currently listed on the WYDOT State Transportation Improvement Program (STIP), which projects to 2019. Within this segment, the sidepath was designed to accommodate the future widening. It was assumed that widening would include an additional 12-foot travel lane in each direction along with a 12-foot auxiliary lanes and 7-foot buffer from the proposed sidepath. Therefore, the sidepath was offset 20 to 27 feet from the existing edge of pavement to ensure the widening project would not require reconstruction of the sidepath. If the widening does not occur, then the sidepath will have a wide buffer that will enhance the comfort and safety of users.

3.1 Option 1

Option 1 proposes a 10-foot two-way combination (detached/attached) sidepath along the north side of Wyoming Boulevard. An illustration of the proposed cross section is provided below (Figure 3-1).

Figure 3-1: Option 1 Sidepath Conceptual Cross-Section



3.1.1 Challenges and Constraints

Based on our review of existing field conditions and the proposed sidepath layout for Option 1, we have identified the following challenges and constraints:

- **Accommodations for Steep Slopes and Embankments**
 - Between CY Avenue and Denis Drive due to the uphill between Wyoming Boulevard and the Shell Gas Station property (Sheet 4)
 - Just north of Eagle Drive, near the residential properties, due to slope (Sheet 6)
 - Just south of Eagle Drive due to steep slope (Sheet 7)
 - Just south of the church access due to steep slope (Sheet 14)



- Between McKinley Street and Scenic Route due to steep slope (Sheet 17)
- Various segments between Scenic Route and Kingsbury Drive due to steep slope (Sheets 22, 24)
- Between Kingsbury Drive and Centennial Village Drive due to steep slope (Sheet 26)

- **Trail Width Constraints (less than 10 feet)**
 - North of 15th Street due to existing fence line and concrete ditch, 6-foot trail (Sheets 28 and 29)
 - Between the Safeway access and 2nd Street due to right-of-way, large utilities, and existing retaining wall (Sheet 32)

- **Buffer Width Constraints (less than 7 feet)**
 - South of Sunrise Drive along residential properties due to existing fence, 5 foot buffer (Sheet 10)
 - Attached: Between Denis Drive and Outer Road due to the topography and right-of-way (Sheet 4)
 - Attached: South of Sunrise Drive to Coffman Avenue due to large utility poles, a large drainage structure, and topography (Sheet 10)
 - Attached: Between Coffman Avenue and Poplar Street due to available width between Wyoming Boulevard and the apartment complex property (Sheet 11)
 - Attached: Either side of the Yesness Park Access due to the topography (Sheet 12)
 - Attached: Between 15th Street and 12th Street due to existing fence line and concrete ditch (Sheets 28 and 29)
 - Attached: Gannett Street to Safeway access due to existing buildings (Sheet 32)
 - Attached: Between I-25 ramp terminal intersections due to existing bridge columns (Sheets 33, 34)

- **Utility Relocation**
 - Small utility boxes and markers along fences near Arroyo Drive (Sheet 9)
 - Small utility boxes and meters along fences north of 12th Street (Sheets 29, 30)
 - Light poles north and south of Carriage Lane (Sheets 30, 31)
 - Large utility box south and north of Carriage Lane (Sheets 30, 31)
 - Traffic Controller Cabinet and utility meters on the northwest corner of the intersection at Carriage Lane (Sheet 31)



- Small utility meters north of Gannett Street (Sheet 32)
- Relocate Fire Hydrant on northwest corner of intersection with 2nd Street (Sheet 32)
- Large utility box south of Legion Lane (Sheet 33)

- **Potential Environmentally Sensitive Area (requires further study)**
 - South of Sunrise Drive, south of residential fences (Sheet 10)
 - Just south of the church access (Sheet 14)
 - Midway between Casper Mountain Road and McKinley Street (Sheet 15)
 - South of McKinley Street, near the detention pond (Sheet 17)

- **Drainage Structure Adjustments**
 - Extension of the drainage structure, south of McKinley Street, near the detention pond (Sheet 17)
 - Extension of the drainage structure, north of Scenic Route (Sheet 20)
 - Extension of the drainage structure, midway between Scenic Route and Kingsburg Drive (Sheet 24)

- **Sidewalk Removal** (it is assumed that all existing sidewalks along the north side of Wyoming Boulevard will be removed and replaced with the proposed sidepath)
 - Between Denis Drive and Outer Drive (Sheet 4)
 - Between Arroyo Drive and Yesness Park Access (Sheets 9, 10, 11)
 - Between 15th Street and Yellowstone Highway (Sheets 28 to 34)

- **Other**
 - Relocation of large sign at the bank entrance (Sheet 32)
 - South of Legion Lane, backed in parking results in vehicle's back ends encroaching 2 to 4 feet onto proposed sidepath (Sheet 33)

3.1.2 Right-of-Way Considerations

The majority of right-of-way impacts were focused on both the east and west ends of the corridor in the more developed commercial areas. Since this land is more developed, it is more valuable and would thus have a higher acquisition cost. The table below summarizes the general location of the property impact,



property owner information, corresponding sidepath design plan sheet number, impacted acreage, and associated value.

The value of potential property acquisitions was estimated by linking the GIS parcel ID numbers and the County Assessors property value database. The property values were converted into price per acre. The assumed acreage was measured as the area needed for the sidepath cross section, plus two feet from back of the sidepath.

As previously noted, based on the discrepancies between the fence line in the aerials and parcel line information, these right-of-way impacts will need to be evaluated further during the final design to provide a more accurate assessment of impacts.

Table 3-1: Right-of-Way Considerations for Option 1

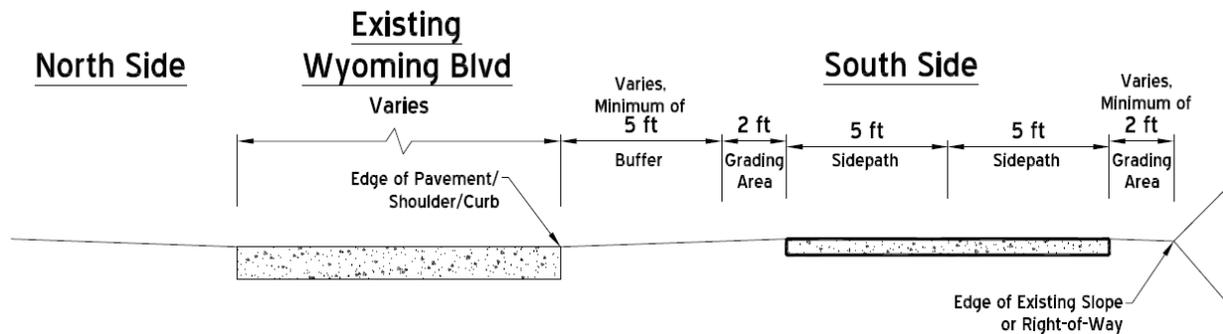
Ref. No.	Location	Brief Description	Property Owner	Sheet No.	Area (acre)	Price
1-1	Between CY Ave and Denis Dr	Shell Gas Station Property	Dooley Oil Inc	4	0.16	\$ 85,822.13
1-2	Between CY Ave and Denis Dr	Car Wash Property	Dooley Oil Inc	4	0.09	\$ 65,457.96
1-3	South of Plaza Dr/Outer Dr	Diner Property	Ricor Properties LLC	4, 5	0.04	\$ 17,129.45
1-4	West of Arroyo Dr	Vacant Property adj. to residential fence	Mesa Development Inc.	8	0.05	\$ 339.19
1-5	Northeast corner of Poplar St	Adj. to Elementary School Property	City of Casper	11	0.05	\$ -
1-6	Between Casper Mtn Rd and McKinley St	Vacant Property	Leroy Thomas et UX	14	0.41	\$ 10,135.83
1-7	Between Casper Mtn Rd and McKinley St	Vacant Property	Lyle D Wirth et Al Trustees	14, 15	0.62	\$ 1,377.81
1-8	Between Casper Mtn Rd and McKinley St	Vacant Property	David Frech et Al	15, 16	0.75	\$ 2,729.07
1-9	Between Casper Mtn Rd and McKinley St	Vacant Property	Ronald E. Wright Living Trust	16	0.66	\$ 1,613.54
1-10	South of Kingsbury Dr	Vacant Property	Country Club	22, 23	1.51	\$ 1,146.41
1-11	South of Carriage Ln	Elementary School Property	Natrona County School District	30, 31	0.18	\$ -
1-12	North of Gannett St	Bank Property	Community First National Bank	32	0.09	\$ 142,628.77
1-13	North of Gannett St	Village Inn Property	Falgers Inc.	32	0.09	\$ 26,662.30
				Total	4.61	\$ 355,042.46



3.2 Option 2

Option 2 provides a 10-foot two-way combination (detached/attached) sidepath along the south side of Wyoming Boulevard. An illustration of the proposed cross section is provided below (**Figure 3-2**).

Figure 3-2: Option 2 Sidepath Conceptual Cross-Section



3.2.1 Challenges and Constraints

Based on our review of existing field conditions and the proposed sidepath layout for Option 2, we have identified the following challenges and constraints:

- **Accommodations for Steep Slopes and Embankments**
 - Just north of Eagle Drive, near the residential properties due to steep slope (Sheet 6)
 - Between McKinley Street and Scenic Route due to steep slope (Sheet 17)
 - Midway between Scenic Route and Kingsbury Drive due to steep slope (Sheet 24)
 - Between Kingsbury Drive and Centennial Village Drive due to steep slope (Sheet 26)
 - Between Mall Driveway and 2nd Street due to steep slope (Sheet 32)
- **Trail Width Constraints**
 - Between CY Avenue and Denis Drive due to width between Wyoming Boulevard curb-and-gutter and the small retaining wall along the Starbucks property (Sheet 4).
- **Buffer Width Constraints**
 - Between Arroyo Drive and Valley Road due to existing concrete ditch, 2 foot buffer (Sheet 9)



- Between Coffman Avenue and Poplar Street due to existing retaining wall for the church parking lot, 2 foot buffer (Sheet 11)
- Attached: Between I-25 ramp terminal intersections due to existing bridge columns (Sheets 33, 34)
- **Potential Environmentally Sensitive Area (requires further study)**
 - North of Chinook Trail/Coffman Avenue (Sheet 10)
 - Just south of the church access (Sheet 14)
 - Midway between Casper Mountain Road and McKinley Street (Sheet 15)
 - South of McKinley Street, across from the detention pond (Sheet 17)
- **Utility Relocation**
 - Light poles between Mall Driveway and 2nd Street (Sheet 32)
 - Small utility boxes and utility meters on northeast corner of intersection with 2nd Street (Sheet 32)
- **Drainage Structure Adjustments**
 - Extension of the drainage structure, south of McKinley Street, across from the detention pond (Sheet 17)
 - Extension of the drainage structure, north of Scenic Route (Sheet 20)
 - Extension of the drainage structure, west of Kingsbury Drive (Sheet 24)
- **Sidewalk Removal** (it is assumed that all existing sidewalks along the south side of Wyoming Boulevard will be removed and replaced with the proposed sidepath)
 - South of Plaza Drive (Sheets 4, 5)
 - Southeast of Eagle Drive (Sheet 7)
 - Between Centennial Hills Boulevard and Yellowstone Highway (Sheets 28 to 34)
- **Other**
 - Near Denis Drive, backed in parking results in vehicle's back ends encroaching 2 to 4 feet onto proposed sidepath(Sheet 4)
 - Southeast corner of intersection at Casper Mountain Road, caution constructing trail around traffic control box (Sheet 13)
 - Relocation of large sign at the mall entrance (Sheet 31)



- South of Legion Lane, backed in parking results in vehicle's back ends encroaching 2 to 4 feet (Sheet 33)
- Traffic Controller Cabinet and pedestrian signal pole on the northwest corner of the I-25 Westbound ramp terminal intersection (Sheet 34)

3.2.2 Right-of-Way Considerations

The majority of right-of-way impacts were focused on both the east and west ends of the corridor in the more developed commercial areas. Since this land is more developed, it is more valuable and thus have a higher acquisition cost. A major reason for the higher right-of-way costs with Option 2 was due to the impacts to the Eastridge Mall property, which identified the property line at the existing back edge of sidewalk. The table below summarizes the general location of the property impact, property owner information (where available), corresponding sidepath design plan sheet number, impacted acreage, and associated value.

The value of potential property acquisitions was estimated by linking the GIS parcel ID numbers and the County Assessors property value database. The property values were converted into price per acre. The assumed acreage was measured as the area needed for the sidepath cross section, plus two feet from back of the sidepath.

As previously noted, based on the discrepancies between the fence line in the aeriels and parcel line information, these right-of-way impacts will need to be evaluated further during the final design to provide a more accurate assessment of impacts.



Table 3-2: Right-of-Way Considerations for Option 2

	Location	Brief Description	Property Owner	Sheet	Area (acre)	Price
2-1	Between CY Ave and Starbucks Access	Starbucks Property	Platte River Crossing	4	0.11	\$ 109,848.68
2-2	Between CY Ave and Starbucks Access	Business Property	S E P Family LTD	4	0.27	\$ 60,669.13
2-3	South of Plaza Dr/Outer Dr	McDonalds Property	McDonald's Real Estate	4	0.09	\$ 43,185.44
2-4*	South of Plaza Dr/Outer Dr	Credit Union Property	Reliant Federal Credit Union	4	0.01	\$ 373.50
2-5	Between Plaza Dr and Talon Dr	Business/Vacant Property	Long Term LLC	5	0.19	\$ 7,096.53
2-6	Northwest corner at Eagle Dr	Vacant Property	R C Shogi LLC	7	0.09	\$ 17,563.24
2-7	Southwest corner at Eagle Dr	Bank Property	Western Vista Federal Credit Union	7	0.01	\$ 19,392.94
2-8*	Southeast corner at Coffman Ave	Church Property	Shephard of the Hills Presbyterian Church	10	0.04	\$ 6,337.37
2-9	North of Blackmore Rd	Open Space Property near Pedestrian Bridge	City of Casper	30	0.37	\$ -
2-10	Between Blackmore Rd and Mall Entrance	Mall Property	PDC- Eastridge Mall LLC	30, 31	0.26	\$ 141,760.83
2-11	Between Mall Entrances	Mall Property	PDC- Eastridge Mall LLC	31, 32	0.51	\$ 278,069.33
2-12	Between Mall Entrance and 2nd St	Mall Property	PDC- Eastridge Mall LLC	32	0.44	\$ 239,902.95
				Total	2.39	\$ 924,199.94

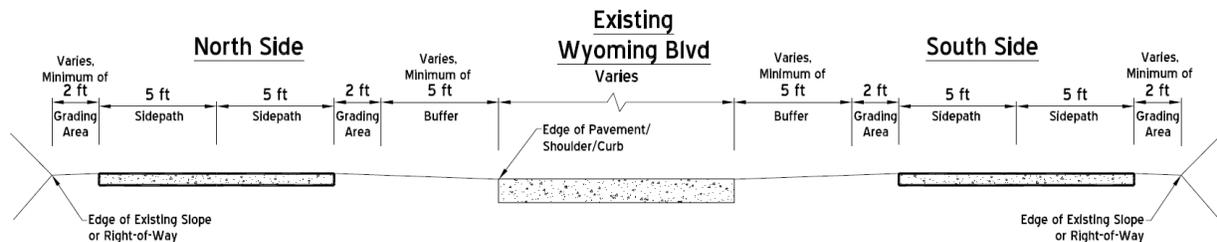
* Estimated based on adjacent parcel value due to insufficient data.



3.3 Option 3

Option 3 provides a 10-foot one-way combination (detached/attached) sidepath along both sides of Wyoming Boulevard. An illustration of the proposed cross section is provided below (**Figure 3-3**).

Figure 3-3: Option 3 Sidepath Conceptual Cross-Section



Since Option 3 combines both the north and south sidepaths into one option, the challenges and constraints discussion for those options should be referenced to understand the impacts presented within this option.

Similar to the challenges and constraints discussion above, the right-of-way considerations discussion for Options 1 and 2 can be referenced to understand the impacts presented within Option 3.

There is potential to alter Option 3 to include only one sidepath that alternates between the north and south sides of Wyoming Boulevard. The benefits of this approach would be:

- Provides a full-width trail the entire length of the corridor
- Reduces impacts to environmentally sensitive areas
- Lessens need for right-of-way acquisitions
- Decreases number of potential utility relocations

There are a few major concerns with having an alternative path that need to be considered:

- Introduces multiple crossing for users on an arterial roadway with high speed vehicles
- Increases travel time for sidepath users



If this alternative were to warrant future consideration, we have identified the preferred location of the alignment for each segment below:

- CY Avenue to Eagle Drive – North side
- Eagle Drive to Arroyo Drive – Either side (Would require a signalized crossing at or near Arroyo Drive)
- Arroyo Drive to Casper Mountain Road – North side
- Casper Mountain Road to 15th Street – Either side
- 15th Street to 2nd Street – South side
- 2nd Street to Yellowstone Highway – Either side

3.4 Cost Estimates

Cost estimates were developed for each option utilizing cost data provided within the 2012 WYDOT Weighted Average Bid Prices. For items not found within the WYDOT reference, 2012 cost data from the Colorado Department of Transportation was utilized. A summary of the total cost for each option broken out by capital, contingency, and right-of-way acquisition costs is provided below. A detailed breakdown of the unit cost for each item is provided on the summary of quantities sheet within the conceptual design plan set.

Table 3-3: Estimated Cost for Alternative Designs

	Option 1	Option 2	Option 3
Capital Cost Subtotal	\$ 5,133,500	\$ 5,306,500	\$ 10,440,000
Contingency (30%)	\$ 1,540,050	\$ 1,591,950	\$ 3,132,000
Right-of-Way Cost	\$ 355,042	\$ 924,200	\$ 1,279,242
Total Cost	\$ 7,028,592	\$ 7,822,650	\$ 14,851,242



CHAPTER 4. SUMMARY OF CONCEPTUAL DESIGNS

In order to provide reviewers with an understanding of how each of the sidepath options compares to one another, a consumer report style matrix was developed. It evaluated the following categories:

- **Topographical and Space Constraints** – Considers the number of locations where the sidepath would need to use minimal widths or be attached to the roadway to avoid a space constraint.
- **Weather and Prevailing Winds** – The prevailing winds found along the corridor make a sidepath located on the north side more desirable
- **Connection to future on- and off-street trail network** – Generally the majority of existing and future trail connections will be provided on the north side of the Wyoming Boulevard
- **Constructability** – Considers the amount of drainage, utility, environmental impacts that would need to be mitigated
- **Capital Funding Requirements** – Generally lower capital cost is preferable
- **Right-of-Way Impacts** – Considers the number of potential right-of-way impacts and the associated cost.

Table 4-1: Consumer Report Matrix

	Option 1	Option 2	Option 3
Topographical and Space Constraints	○	◐	◐
Weather and Prevailing Winds	●	○	◐
Connection to Future On- and Off-Street Trail Network	◐	○	●
Constructability	◐	●	◐
Capital Funding Requirements	◐	◐	○
Right-of-Way Impacts	◐	○	○

○ Low (Less Desirable) ◐ Medium ● High (Most Desirable)



APPENDIX A: FIELD NOTES AND PHOTO LOG



**APPENDIX B: REVIEW OF THE PROPOSED ON- AND OFF-STREET
PEDESTRIAN AND BICYCLE FACILITIES**



APPENDIX C: CONCEPTUAL DESIGN PLAN SET

