

MEMORANDUM

TO: Cody Smith, PE, County Engineer / Assistant Director, Deschutes County Road Department
Blaine Wruck, PE, Transportation Engineer, Deschutes County Road Department

FROM: Nicolas Speros, PE, Associate Principal, HHPR
Ben Austin, PE, Principal, HHPR

SUBJECT: NW Lower Bridge Way / NW 43rd Street Intersection Improvements
Alternatives Analysis and Recommended Option to Advance to Construction

Introduction and Purpose

NW Lower Bridge Way is an east-west road connecting the area west of Terrebonne to US97. Between US97 and NW 43rd Street, NW Lower Bridge Way is classified as an arterial road with an average daily traffic volume of 7,724 vehicles per day (2022); west of NW 43rd Street, NW Lower Bridge Way is classified as a collector road with an average daily traffic volume of 1,135 vehicles per day (2022). The road serves as a major segment of the Sisters to Smith Rock Scenic Bikeway (STSRSB). NW 43rd Street is a north-south collector road connecting Crooked River Ranch (via NW Chinook Drive) to NW Lower Bridge Way with an average daily traffic of 6,782 vehicles per day (2022).

The intersection of NW Lower Bridge Way and NW 43rd Street is presently a three-legged intersection with stop sign control on the NW 43rd Street leg only, where there has been a history of crashes. NW 43rd Street intersects NW Lower Bridge Way approximately at a right angle, and a horizontal curve is present on the east leg of NW Lower Bridge Way. The intersection is a primary node for both recreational and residential traffic and is bisected by the Sisters to Smith Rock Scenic Bikeway. The Project Location is shown on Attachment 1.

As the directional traffic count data shown on Attachment 2 suggests, traffic at the intersection primarily flows between the east leg of NW Lower Bridge Way and NW 43rd Street. This corridor provides the primary access to Crooked River Ranch, a community located in both Deschutes and Jefferson Counties with a population of approximately 5,000. With its current alignment, the NW Lower Bridge Way / NW 43rd Street intersection is inadequately configured to accommodate the traffic volumes and movements that are occurring.

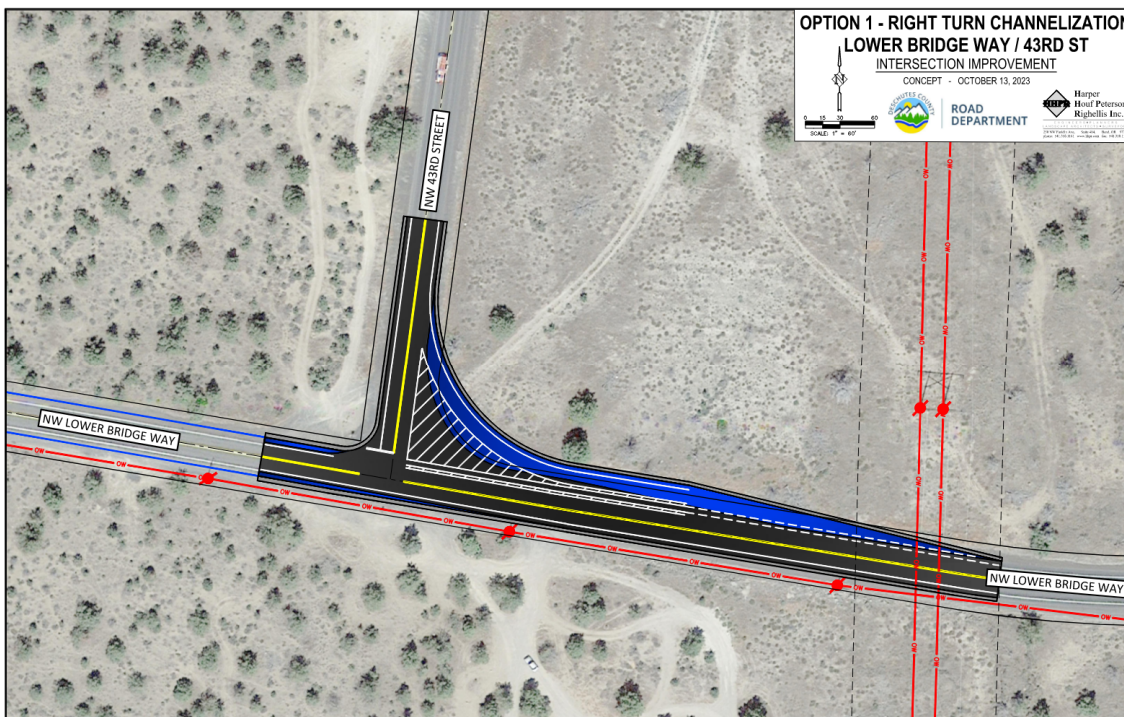
The NW Lower Bridge Way / 43rd Street Intersection Improvement project is Phase 1 of a larger roadway improvement project on NW Lower Bridge Way between 43rd Street and Teater Avenue. The intersection improvement project is identified in the County's 2010-2030 Transportation System Plan (TSP) as a high priority project with the goal of completing construction by December 31, 2025.

The scope of the project is to revise intersection geometry to improve safety for vehicle and bicycle traffic, and provide related pavement markings, signage, and lighting as may be required for the selected improvement option.

HHPR considered three intersection improvement options to meet the project goals. The three options with informational callouts are conceptually shown on Attachments 3-5. They can generally be summarized as follows:

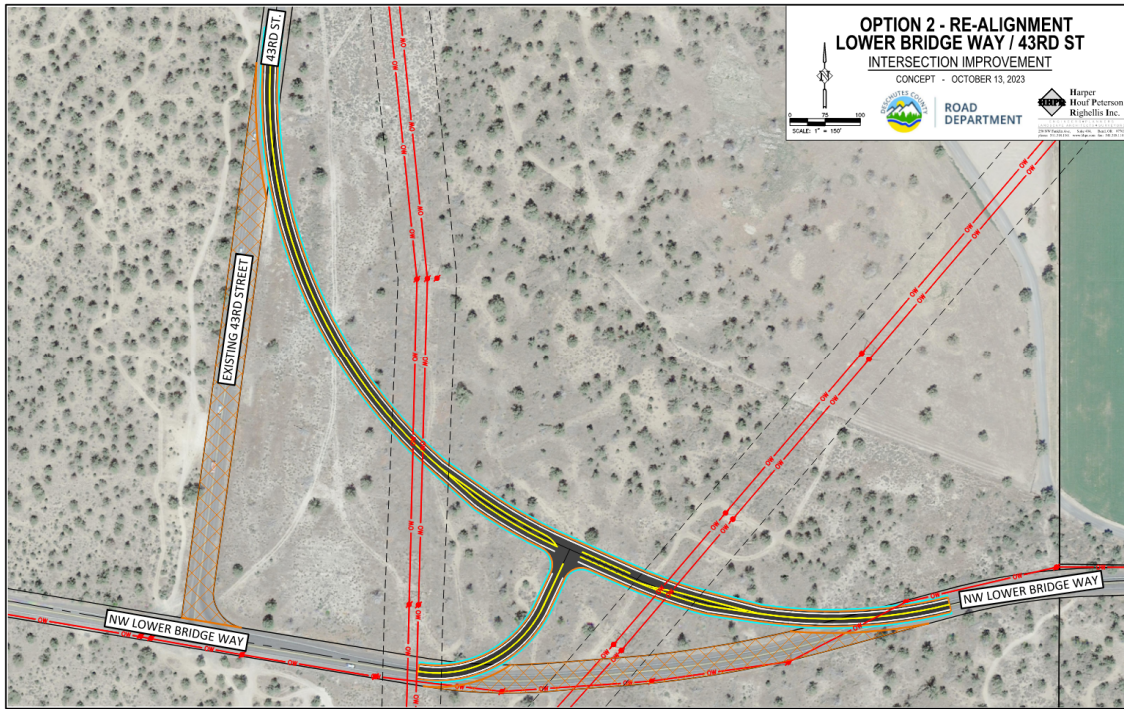
Option 1 (Expanded Right Turn Channelization)

Extends the length of the westbound right turn lane, and provides shoulder widening, new pavement markings, and a bicycle lane. The main purpose of this option is a low-cost option to reduce the westbound right turn movement from conflicting with sight distance for vehicles entering Lower Bridge Way from 43rd Street.



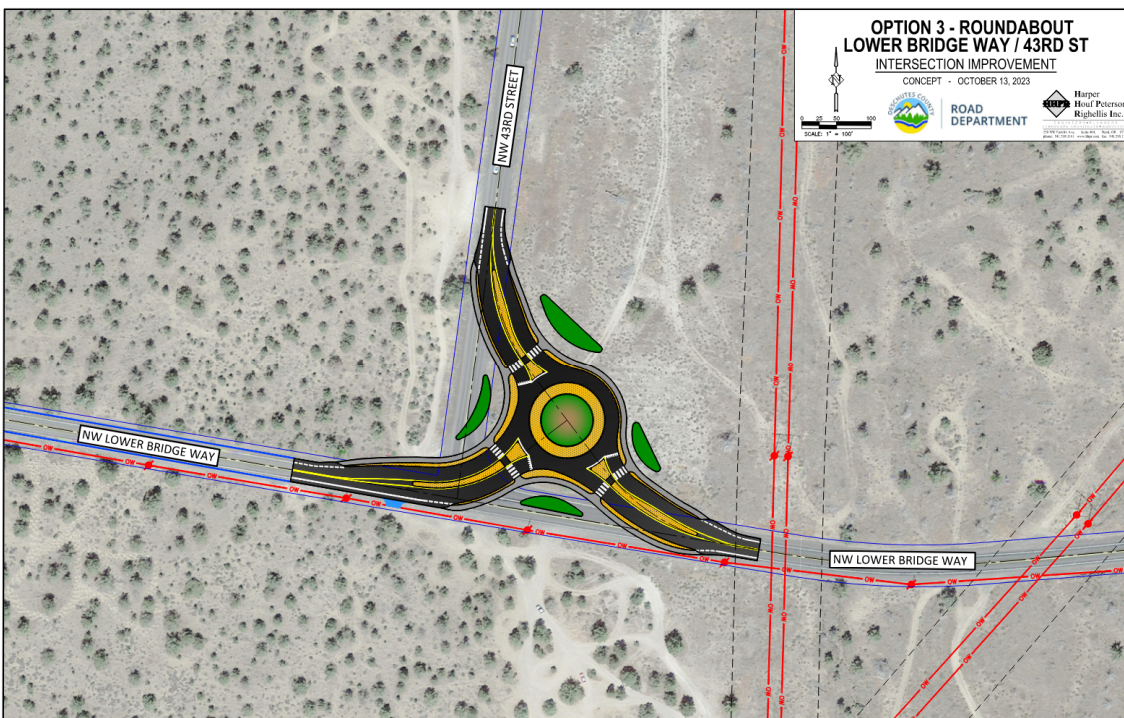
Option 2 (Realignment)

Realigns the roadway so the north and east legs become the through traffic direction and the west leg becomes the T-intersecting leg. The main purpose of this option is to match the roadway geometry with the primary travel directions.



Option 3 (Roundabout)

Installs a new offline roundabout NE of the existing intersection. The main purpose of this option is to provide traffic calming to all users for all legs and allows for potential future increased traffic volumes on the west leg.



The following factors were considered for each option and are briefly discussed below.

1. Traffic Operations and Safety
2. Construction Cost
3. ROW / BLM impacts
4. BPA impacts
5. PGE impacts
6. Pacific Power impacts
7. Construction Staging Impacts
8. Stormwater Management
9. Public Outreach

1. Traffic Operations and Safety

DKS Associates performed an Intersection Evaluation and Traffic Analysis of the existing intersection and the three options for opening year (2026) and a 20-year time horizon (2046). The evaluation considered each option's mobility operations and safety. A fourth option, all way stop control, was evaluated as an interim mitigation, but was not considered as a final option and is not included in this alternatives analysis. A copy of the complete DKS traffic analysis memo and supporting data is provided in Appendix 1 and 2.

The Operations and Safety findings of the DKS traffic memo for Options 1-3 are summarized below.

Intersection Operations (v/c Ratio and LOS)

Per the memo, Level of Service (LOS) ratings and volume-to-capacity (v/c) ratios are two commonly used performance measures to evaluate intersection congestion.

1. The ODOT v/c mobility target ratio is 0.75 or better and all options meet this guideline. The worst-case v/c ratio is 0.57 for Option 1, 2046 AM Peak Hour.
2. The County mobility standard for intersection operation is LOS D, and all options exceed this standard with the worst-case being LOS B for Options 1 and 2. Option 3 has an LOS A rating. The LOS ratings are the same for 2026 and 2046 volumes.

Intersection Safety (Crash Reduction and Bicycle Safety)

Per the DKS traffic memo, 11 crashes were identified at the existing intersection with three of the crashes not being related to intersection geometry. Of the remaining eight crashes, four involved the southbound left turn lane and the other four were rear-end accidents in the same lane. To analyze the potential safety benefits for each option, a crash modification factor (CMF) was used to compute the expected number of crashes after implementing the CMF countermeasure associated with each option.

1. Based on the three options and corresponding CMF countermeasure, the approximate crash reductions calculated for each option are as follows:

Description	%	Reduces rear-end and left turn conflicts
Option 1 (channelization):	2-19%	No (see note below)
Option 2 (realignment; left turn):	18-44%	Yes (see note below)
Option 3 (roundabout):	26%	Yes

Key points from the DKS memo

- “Alternative 1 is not expected to have an impact on these types of crashes” which is referring to rear-end and left turn conflicts.
 - The Option 2 CMF is only for adding a left turn lane on the major road approach.
2. As noted previously, Lower Bridge Way is part of the Sisters to Smith Rock Scenic Bikeway (STSRSB) and intersection improvements should consider impacts to this bikeway. Bicycle safety for each option can be summarized as follows:
 - Option 1: A new bicycle lane for westbound traffic will improve visibility and remove the shared lane across the intersection which will increase driver awareness and bicycle safety.
 - Option 2: Creates the most risk for cyclists as the new intersection requires westbound cyclists to cross two lanes of high speed and high-volume traffic.
 - Advanced warning signs or a marked /protected crossing could help mitigate this risk, but caution should be taken in placement of the crossing to ensure the visibility of cyclists to vehicles as the large radius curve could introduce higher travel speeds.
 - Option 3: Provides the most safety for cyclists. Westbound cyclists would still cross two lanes of traffic, but the roundabout would reduce vehicle speeds to approximately 20-30 mph as opposed to 55 mph plus for through traffic (Realignment, Option 2). Lighting will be provided as it is already required for vehicles and additional signing and pavement marking can also be provided for cyclists to increase safety.

Key Traffic Findings

An abbreviated version of The Key Findings section in the DKS traffic analysis memo is provided below:

- *Alternative 1 (Expanded Right Turn Channelization) is operationally the same as the Existing Geometry with the same delay and similar queues for all movements.*
- *Alternative 2 (Intersection Realignment) has similar delay as No Build and Alternative 1 with an increase for the eastbound queue (this approach is now stop controlled with this option) but provides the best v/c ratio of all the alternatives.*
- *Alternative 3 (Roundabout) provides the lowest average delay per vehicle and generally the shortest approach queues.*
- *Rear-ends and left turn conflicts are the two main types of crashes seen at the intersection*
 - *Alternatives 2 and 3 would best mitigate these types of crashes by removing the high volume left turning conflicts from NW 43rd Street.*

Overall, Alternative 2, and Alternative 3 provide the best improvements for mobility and address the NW 43rd Street queues. However, these alternatives increase the conflict with the Sisters to Smith Rock Scenic Bikeway trail riders without additional features for bicycle safety.

Traffic Operations and Safety Summary

Traffic Operations - are acceptable for all options, with Option 3 having the best average operation accounting for all legs. V/C ratios are well within acceptable ranges for all options, but Option 3 has the lowest average delay. All Options have an LOS of B or better, with Option 3 having LOS A.

Vehicle and Bicycle Safety - Due to the limited safety and operational improvements, Option 1 should be not implemented as a long-term solution. Option 2 and 3 provide the best vehicle safety improvements but increase conflict points with the STSRSB and bicycles without additional mitigation. Option 3 better mitigates these conflict points as the roundabout geometry provides traffic calming measures that can be supplemented with additional signage, pavement markings, and lighting. Option 3 provides the best combined vehicle and bicycle safety.

For the remaining sections below, Option 1 (channelization) is reviewed, but is assumed to not be a viable option for advancing to final design and construction and is not considered in the Section Summaries.

2. Construction Cost

A preliminary construction cost estimate was prepared for each option and is summarized below. A significant contingency was included for each option (30-40%) but does not alter the relative difference between options.

- Option 1: \$311,000
- Option 2: \$2,000,000
- Option 3: \$2,095,000

Construction Cost Summary

The relative cost difference between Options 2 and 3 is not large enough to meaningfully differentiate between the two options.

Detailed preliminary construction cost estimates are provided for each option in Attachments 6-8.

3. ROW / Bureau of Land Management (BLM) Impacts

As the intersection is surrounded by USA owned (BLM managed) land on all sides, any new right of way would need to be acquired from BLM. HHPR and Deschutes County staff met virtually with BLM staff on July 11, 2023, to discuss the acquisition and review process and proposed options. BLM staff present included:

- John Griley, Realty Specialist, Prineville BLM, Deschutes Field Office, jgriley@blm.gov, 541-416-6774
- Autumn Loewen, Realty Specialist, Prineville BLM, Deschutes Field Office, aloewen@blm.gov, 541-416-6868
- Ferris Couture, Planning and Environmental Coordinator, Prineville BLM, Deschutes Field Office, fcouture@blm.gov, 541-416-6711

Deschutes County is also in the process of renewing additional road rights of way throughout the County on BLM managed land, but we understand any ROW acquired for this project would be a separate process.

In general, unless roadway improvements can be limited to within existing right of way, a categorical exclusion would not apply and an Environmental Assessment (EA) would be required. BLM staff advised that they are

backlogged and recommended hiring a subconsultant to expedite the project schedule to perform any required NEPA analysis that BLM staff would then review and approve. All three options will require additional ROW and therefore an EA process. The approximate and preliminary impact areas are noted below:

- Option 1: 0.2 +/- acres
- Option 2: 2.8 +/- acres
- Option 3: 1.9 +/- acres

BLM staff raised the possibility of the EA process being reduced or avoided on the basis that there are already numerous encumbrances and impacts in the surrounding area (County Road, BPA, and PGE rights of way and the proposed improvements would not meaningfully create additional impacts. This possibility should be reviewed with BLM staff, but not relied upon when estimating project schedule and cost unless confirmed.

ROW/BLM Impacts Summary

All options are anticipated to require an EA and NEPA analysis. Potentially, the smaller impact area options would reduce the document preparation and review time and would facilitate a quicker acquisition. In this scenario, Option 3, with a smaller and more compact impact area, may have a shorter acquisition time frame.

4. Bonneville Power Administration (BPA) Impacts

As depicted on the options graphics, BPA has a 230 kV transmission facility crossing Lower Bridge Way approximately 900' east of the existing intersection in a generally north-south direction within a 125' wide right of way easement. HHPR and Deschutes County staff met virtually with BPA staff on November 27, 2023, to discuss potential impacts of the proposed options and BPA review process. BPA staff present included:

- Deanna Shoemaker, Realty Specialist, Real Property Field Services-Redmond, Bonneville Power Administration, dshoemaker@bpa.gov, 541-516-3258
- Darrell Aaby, Operations-Redmond, Bonneville Power Administration, dkaaby@bpa.gov

BPA's feedback for each option can generally be summarized as follows:

- Option 1: No operational opinion on Option 1 as it would not impact or change their current operations or access.
- Option 2: BPA staff voiced concerns about changes to their access, specifically the need to exit/enter the road on a horizontal curve with high-speed traffic. Also perceived concerns about towers being located adjacent to horizontal curvature and cars losing control and leaving the roadway.
 - Vertical clearance under the wires at the new crossings appears to be adequate but would need to be reviewed and approved by BPA as part of the crossing application.
 - BPA did not provide vertical clearance requirements but are likely similar to clearances provided by PGE as noted below.
 - Potential mitigations for access concerns could include larger driveway access points than are currently provided, which could potentially increase BLM impact area.
- Option 3: BPA staff voiced support for this option as it would not change their current access and the roundabout would provide traffic calming for vehicles in proximity to their easement access point.

Should Option 2 be advanced to design, a crossing application would need to be submitted to BPA for review and approval. The estimated review schedule, 8-10 weeks, would need to be incorporated into the design

schedule but can likely be accommodated without negatively affecting the preferred schedule and bid date. Additional agency and contractor coordination would also be required before and during construction.

BPA Impacts Summary

Option 2 will require horizontal and vertical clearance design coordination and likely access mitigations as well as construction coordination. Option 3 was supported by BPA staff and would avoid any work within the BPA easement area.

5. Portland General Electric (PGE) Impacts

As depicted on the option graphics, PGE has a 230 kV transmission facility crossing Lower Bridge Way approximately 500' east of the existing intersection in a north-south direction within a 125' wide right of way easement. HHPR and Deschutes County staff met virtually with PGE staff on November 11, 2023, to discuss potential impacts of the proposed options and PGE review process. PGE staff present included:

- Scott Stocker, PE, Transmission Engineer, Maintenance Engineering, scott.stocker@pgn.com, 503-709-9438

PGE's feedback for each option can generally be summarized as follows:

- Option 1: No operational concerns but would require coordination regarding pavement widening within easement area and a crossing application would likely be required.
- Option 2: Did not voice operational concerns but stated the need to maintain access to their easement on both sides of the road and likely providing new driveway access points.
 - Provided a PGE vertical clearance requirement of 25.5' (greater than 22.5' requirement per National Electrical Safety Code (NESC) standards).
 - Vertical clearance under the wires at the new crossings appears to be adequate but would need to be reviewed by PGE as part of the crossing application.
 - During the meeting did not state concerns about accessing their easement along the proposed horizontal curve, but this concern may be raised during a more detailed review.
 - Potential mitigations could include larger driveway access points than are currently provided, which could potentially increase BLM impact area.
- Option 3: Did not voice any operational concern as this option would not change their current access and the roundabout would support traffic calming for vehicles in proximity to their easement access point.
 - Potentially would require coordination for minor pavement improvements within the easement area and a crossing application may be required, depending on final geometry.

PGE Impact Summary

Option 2 will require horizontal and vertical clearance design coordination and likely access mitigations as well as construction coordination. Option 3 was supported by PGE staff and would have minimal, or possibly avoidable, impact and coordination requirements.

6. Pacific Power (PP) Impacts

As depicted on the option graphics, PP has poles/overhead wires along south side of Lower Bridge Way that crosses the road to the north side approximately 1,400' east of the existing intersection. HHPR and Deschutes County has not met with Pacific Power, but the following generalizations can be made for each option.

- Option 1: No impact to facilities and minimal coordination would be required.
- Option 2: Minimal impact to existing facilities. The new horizontal curve leaving the existing east leg of Lower Bridge Way is near an existing pole and the overhead wire crossing of the road and should be coordinated. It is assumed that the PP facilities are in the County ROW and if the unneeded portion of existing Lower Bridge Way is vacated by the County, PP may need to make accommodations to obtain an easement or relocate their facilities to the new County road ROW location. PP would need to coordinate their crossings individually with BPA and PGE, as may be required.
- Option 3: Minimal impacts to existing facilities, but new roundabout illumination design and power service would need to be coordinated with PP.

Pacific Power Summary

Option 2 may require easement coordination for poles to remain in place or coordination for relocating poles in the new alignment right of way. Option 3 would have minimal coordination of existing facilities but will require design coordination for new roundabout illumination.

7. Construction Staging Impacts

In general, significant construction staging impacts can be avoided for all options. A brief description of each option can generally be summarized as follows:

- Option 1: Smallest scope of improvements and impacts to existing traffic would be minimal and short in duration.
- Option 2: Largest footprint of improvements but nearly all work would occur outside of existing traffic lanes except for conforms to existing for the three legs. As noted earlier, construction coordination with BPA and PGE would be an additional requirement.
- Option 3: The majority of the roundabout construction would occur off-line from the existing roadway with the except of finishing the approach legs and conforms to existing. Some limited construction coordination with PGE could be an additional requirement.

Construction Staging Summary

Although Option 2 will require construction coordination with BPA and PGE, the anticipated difference in construction staging impacts is not large enough to meaningfully differentiate between the two options.

8. Stormwater Management

In general, stormwater management is not anticipated to be a significant design constraint for the project. A brief description of stormwater management for each option can generally be summarized as follows:

- Option 1: Anticipated scope of work is limited to roadside swale or filter strips and an extension of the existing 18" culvert east of the intersection to extend beyond the proposed roadway widening and ROW acquisition.

- Option 2: Anticipated scope of work is limited to roadside swale or filter strips and likely new construction of a culvert under the new roadway and ROW alignment.
- Option 3: Anticipated scope of work is limited to roadside swale or filter strips and extension or replacement and extension of the existing 18” culvert east of the intersection to extend beyond the proposed roadway widening and ROW acquisition.

Additional BLM coordination may be required for the stormwater analysis and pipe construction but would likely be similar for all options.

Stormwater Management Summary

The anticipated difference in stormwater management is not large enough to meaningfully differentiate between the two options.

9. Public Outreach

The Deschutes County Road Department will be soliciting community feedback via an online open house website. The open comment period is anticipated to last approximately three weeks. At the time of preparation of this draft memo, collecting community feedback has not been completed. When complete, the feedback will be summarized in the section below. In general, the feedback for each option can generally be summarized as follows:

- Option 1: pending
- Option 2: pending
- Option 3: pending

Public Outreach Summary

Pending

DRAFT Summary of Options Review and Recommendation for a Preferred Option

A qualitative matrix of the Options summarized above is provided in Attachment 9 highlighting the relative difference in options.

As noted previously, due to limited operational and safety improvements, Option 1 was not considered for advancement to final design and construction.

- Option 2 and 3 both have acceptable vehicle operations, but Option 3 has a better average capacity (v/c ratio) and a better LOS (A).
- Option 2 and 3 both provide desired safety improvements for vehicles, but Option 2 safety is focused on the primary travel directions (between the north and east legs) while Option 3 provides equal treatment for all legs and is more “future-proof” if additional traffic volumes develop on the west leg.

- Both Option 2 and 3 increase conflict points for bicycles on the STSRSB, but the impact is more easily mitigated with Option 3 due to the traffic calming provided by the roundabout and options for signage, pavement markings and lighting.
- The only factor in which Option 2 ranked higher than Option 3 was construction cost, but the relative difference of less than \$100k is unlikely to impact the selection.
- BLM/ROW, BPA, and PGE impacts were smaller for Option 3, but not large enough to be a differentiating factor.
- Pacific Power impacts is not anticipated to be significant for either option.
- Construction Staging was similar for both options with a slight advantage to Option 3 because of the BPA and PGE construction coordination required for Option 2.
- Stormwater management implementation is not anticipated to be significant for either option.

Pending feedback from the Public Outreach process, based on the information and analysis noted above and supporting documents, **Option 3 (Roundabout) is the recommended intersection improvement to advance to final design and construction.**

List of Attachments:

- Attachment 1 - Deschutes County provided Project Location Map
- Attachment 2 - Deschutes County provided 2022 ADT Volumes
- Attachment 3 - Option 1 (Right Turn Channelization) Graphic
- Attachment 4 - Option 2 (Realignment) Graphic
- Attachment 5 - Option 3 (Roundabout) Graphic
- Attachment 6 - Option 1 Construction Cost Estimate
- Attachment 7 - Option 2 Construction Cost Estimate
- Attachment 8 - Option 3 Construction Cost Estimate
- Attachment 9 - Options Matrix

List of Appendices:

- Appendix 1 - DKS Associates, Intersection Evaluation and Traffic Analysis Memo
- Appendix 2 - DKS Associates, Supporting Data Attachments for Memo

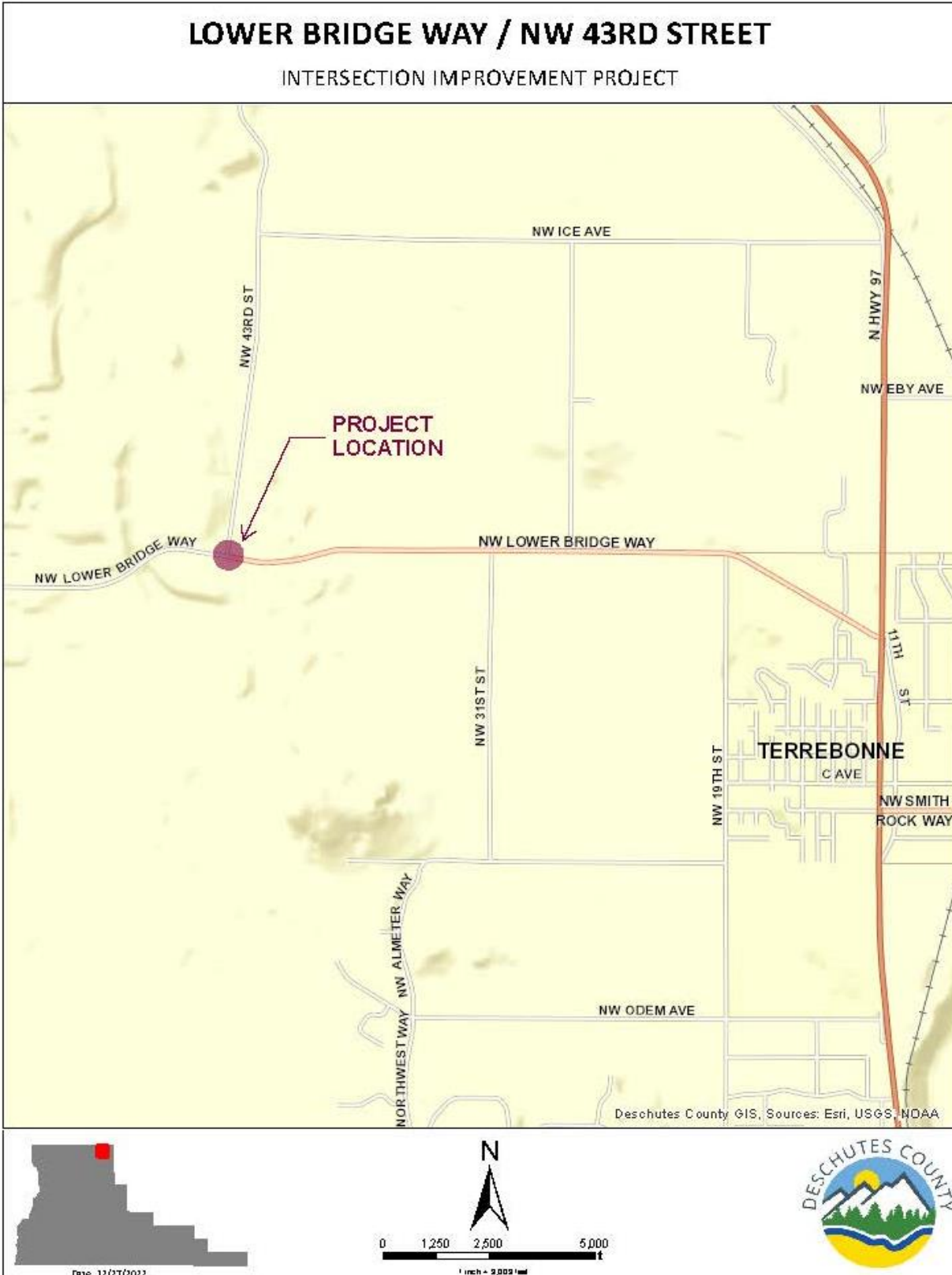
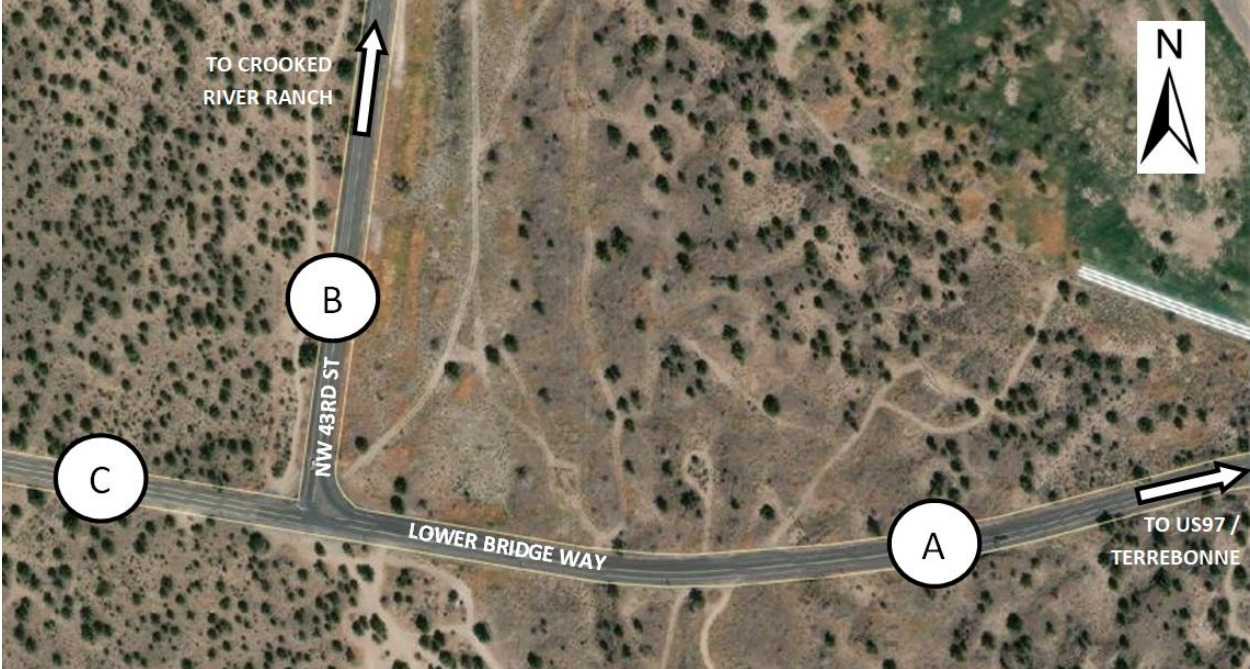


Figure 1 – Project Location Map

Attachment 2



	<u>NB ADT</u>	<u>SB ADT</u>	<u>WB ADT</u>	<u>EB ADT</u>
Location "A"	-	-	3,869	3,855
Location "B"	3,350	3,432	-	-
Location "C"	-	-	545	590

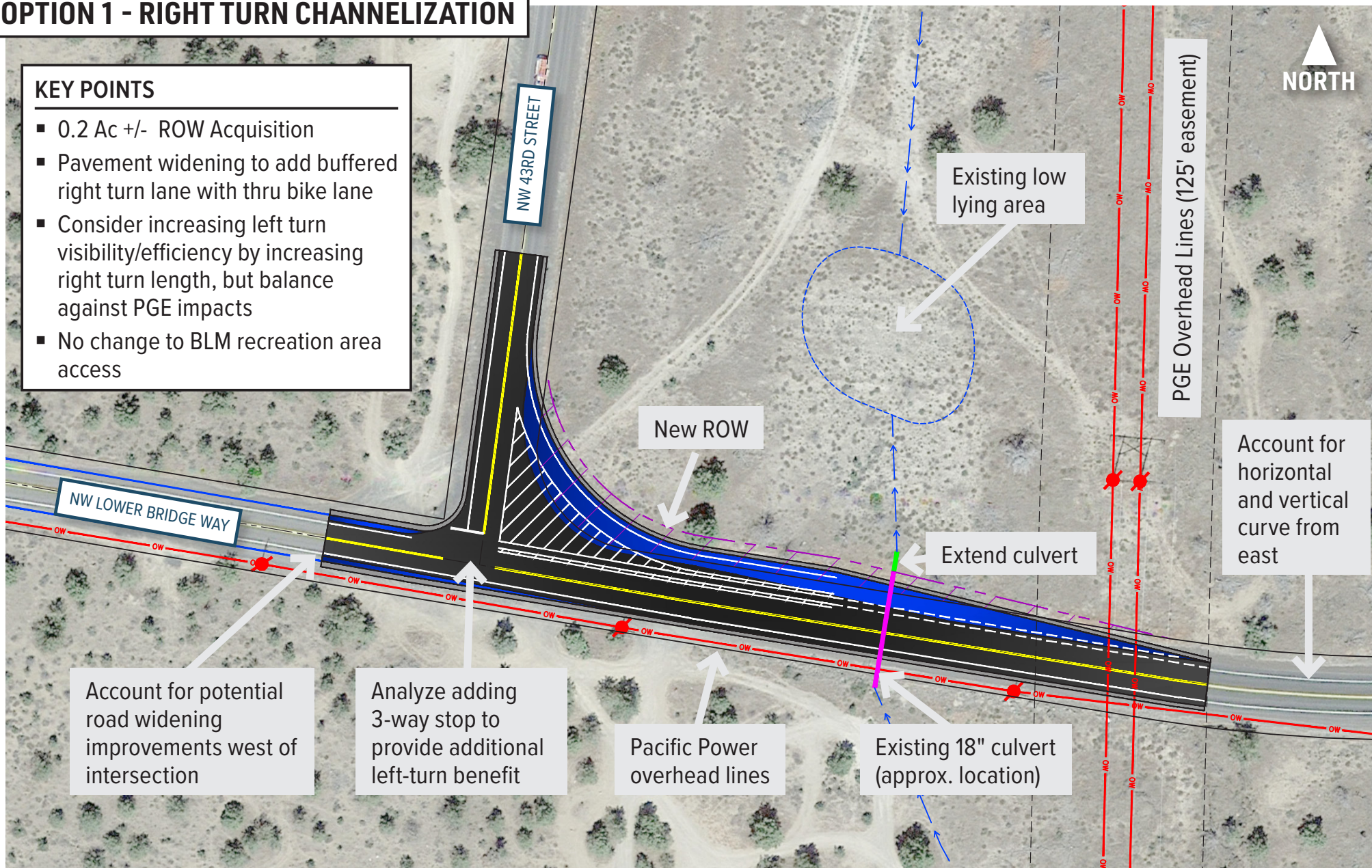
Figure 2 – 2022 Average Directional Daily Traffic (vehicles per day)



OPTION 1 - RIGHT TURN CHANNELIZATION

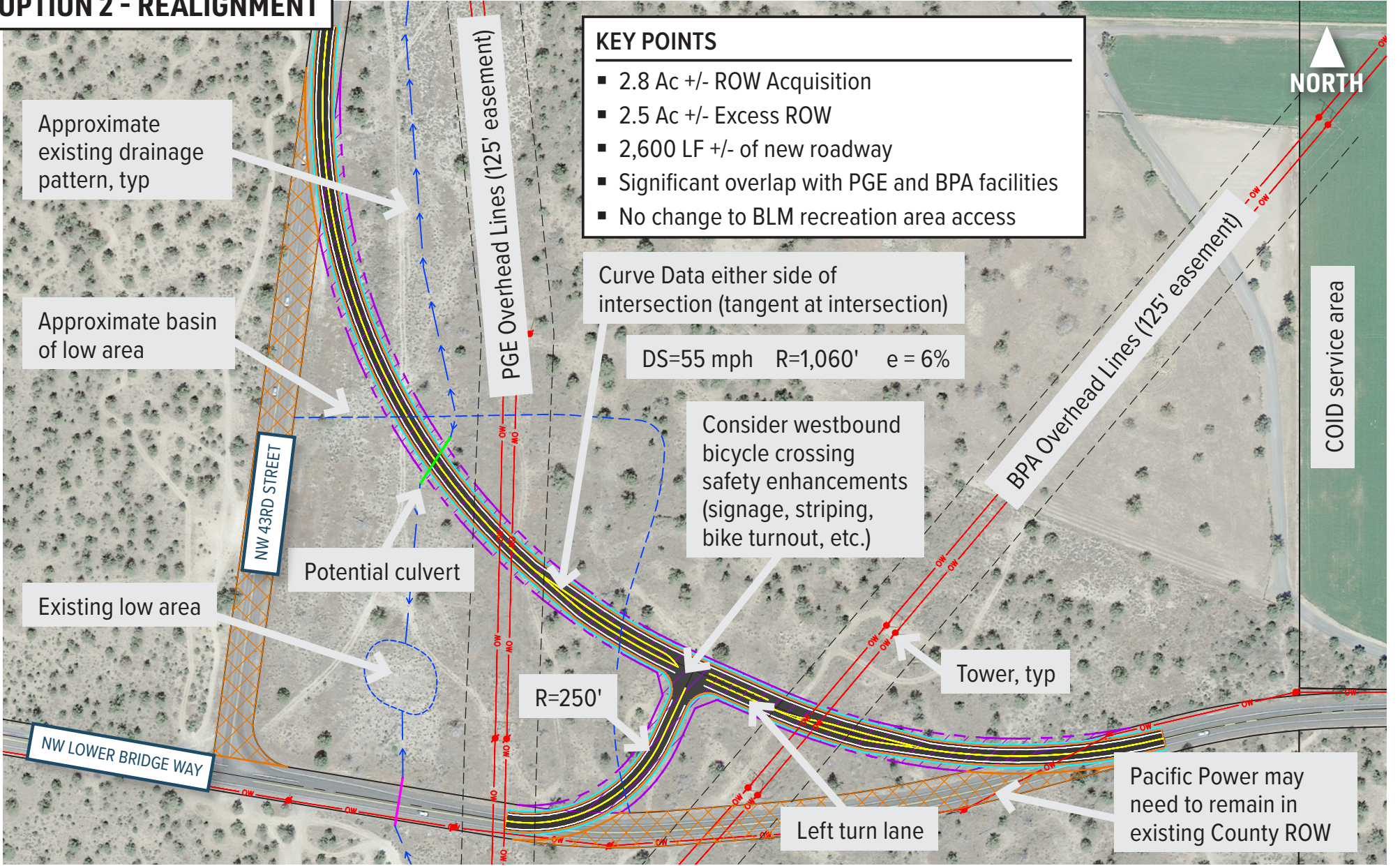
KEY POINTS

- 0.2 Ac +/- ROW Acquisition
- Pavement widening to add buffered right turn lane with thru bike lane
- Consider increasing left turn visibility/efficiency by increasing right turn length, but balance against PGE impacts
- No change to BLM recreation area access





OPTION 2 - REALIGNMENT



- KEY POINTS**
- 2.8 Ac +/- ROW Acquisition
 - 2.5 Ac +/- Excess ROW
 - 2,600 LF +/- of new roadway
 - Significant overlap with PGE and BPA facilities
 - No change to BLM recreation area access

Curve Data either side of intersection (tangent at intersection)

$DS=55 \text{ mph}$ $R=1,060'$ $e=6\%$

Consider westbound bicycle crossing safety enhancements (signage, striping, bike turnout, etc.)

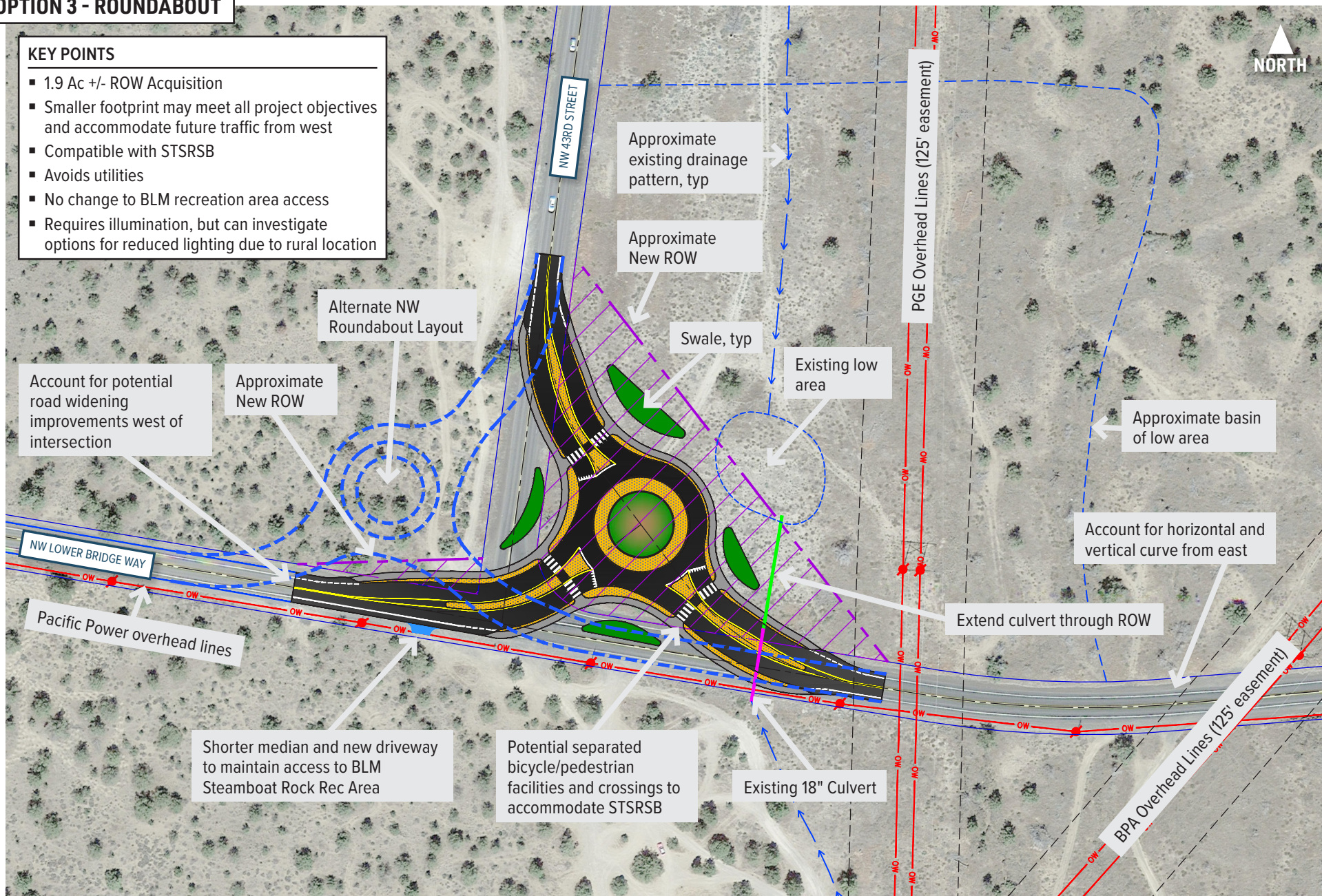
Pacific Power may need to remain in existing County ROW



OPTION 3 - ROUNDABOUT

KEY POINTS

- 1.9 Ac +/- ROW Acquisition
- Smaller footprint may meet all project objectives and accommodate future traffic from west
- Compatible with STSRB
- Avoids utilities
- No change to BLM recreation area access
- Requires illumination, but can investigate options for reduced lighting due to rural location



Attachment 6

**DESCHUTES COUNTY: Lower Bridge Way / 43rd Street Intersection
Construction Estimate (Concept Level) - September 29, 2023
Option 1 - Right Turn Channelization**

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL	% OF SUBTOTAL
1	Mobilization	LS	1	\$ 25,000.00	\$ 25,000.00	11.3%
2	Temporary Work Zone Traffic Control, Complete	LS	1	\$ 15,000.00	\$ 15,000.00	6.8%
3	Erosion Control	LS	1	\$ 5,000.00	\$ 5,000.00	2.3%
4	Construction Survey Work	LS	1	\$ 5,000.00	\$ 5,000.00	2.3%
5	Signing & Striping	LS	1	\$ 21,000.00	\$ 21,000.00	9.5%
6	Removal of Surfacing	SY	150	\$ 10.00	\$ 1,500.00	0.7%
7	Asphalt Pavement Saw Cutting	FT	650	\$ 5.00	\$ 3,250.00	1.5%
8	Removal of Fences (no existing fencing)	LF	0	\$ 5.00	\$ -	0.0%
9	Clearing and Grubbing	AC	0.5	\$ 10,000.00	\$ 5,000.00	2.3%
10	General Excavation	CY	900	\$ 30.00	\$ 27,000.00	12.2%
11	Stormwater Management - WQ Swale (4' wide, 18" thick)	SY	300	\$ 50.00	\$ 15,000.00	6.8%
12	Stormwater Management - 18" pipe extension	LF	20	\$ 250.00	\$ 5,000.00	2.3%
13	3/4 Inch - 0 Inch Aggregate Base (8" thickness)	TON	480	\$ 40.00	\$ 19,200.00	8.6%
14	Aggregate Shoulders (12" thickness)	TON	180	\$ 40.00	\$ 7,200.00	3.2%
15	Level 3, 1/2 Inch ACP Mixture (4" thickness)	TON	310	\$ 120.00	\$ 37,200.00	16.7%
16	Extra for Asphalt Driveway Approaches (assume 1 for PGE)	EA	1	\$ 1,500.00	\$ 1,500.00	0.7%
17	Concrete Curbs, Mountable - Islands and Shoulders	FT	0	\$ 28.00	\$ -	0.0%
18	Concrete Curbs, Mountable - Truck Apron	FT	0	\$ 28.00	\$ -	0.0%
19	Concrete Curbs, 6 Inch Exposure, High Strength Modified	FT	0	\$ 50.00	\$ -	0.0%
20	Stamped Concrete, 6 Inches Thick, Concrete Surfacing	SF	0	\$ 12.00	\$ -	0.0%
21	Stamped Concrete, 8 Inches Thick, Concrete Surfacing	SF	0	\$ 14.00	\$ -	0.0%
22	Bicycle Exit Ramp, Concrete Surfacing	SF	0	\$ 15.00	\$ -	0.0%
23	Pole Foundations	LS	1	\$ 7,850.00	\$ 7,850.00	3.5%
24	Switching, Conduit, And Wiring	LS	1	\$ 19,000.00	\$ 19,000.00	8.6%
25	Permanent Seeding	AC	0.5	\$ 5,000.00	\$ 2,500.00	1.1%
26	Landscaping	LS	0	\$ -	\$ -	0.0%
27	Fencing	FT	0	\$ 50.00	\$ -	0.0%
28			0	\$ -	\$ -	0.0%
29			0	\$ -	\$ -	0.0%
30			0	\$ -	\$ -	0.0%
SUBTOTAL					\$ 222,200.00	

SUBTOTAL CONSTRUCTION **\$ 222,200.00**
CONTINGENCIES **40%** **\$ 88,880.00**
TOTAL CONSTRUCTION **\$ 311,080.00**

Attachment 7

**DESCHUTES COUNTY: Lower Bridge Way / 43rd Street Intersection
Construction Estimate (Concept Level) - September 29, 2023
Option 2 - Realignment**

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL	% OF SUBTOTAL
1	Mobilization	LS	1	\$ 150,000.00	\$ 150,000.00	9.7%
2	Temporary Work Zone Traffic Control, Complete	LS	1	\$ 90,000.00	\$ 90,000.00	5.8%
3	Erosion Control	LS	1	\$ 15,000.00	\$ 15,000.00	1.0%
4	Construction Survey Work	LS	1	\$ 20,000.00	\$ 20,000.00	1.3%
5	Signing & Striping	LS	1	\$ 39,000.00	\$ 39,000.00	2.5%
6	Removal of Surfacing (assume existing road to be vacated)	SY	8,600	\$ 7.00	\$ 60,200.00	3.9%
7	Asphalt Pavement Saw Cutting	FT	200	\$ 5.00	\$ 1,000.00	0.1%
8	Removal of Fences (no existing fencing)	LF	0	\$ 5.00	\$ -	0.0%
9	Clearing and Grubbing	LS	1	\$ 20,000.00	\$ 20,000.00	1.3%
10	General Excavation	CY	8,000	\$ 50.00	\$ 400,000.00	26.0%
11	Stormwater Management - WQ Swale (4' wide, 18" thick)	SY	2,350	\$ 50.00	\$ 117,500.00	7.6%
12	Stormwater Management - 18" pipe crossing with headwalls	LF	80	\$ 250.00	\$ 20,000.00	1.3%
13	3/4 Inch - 0 Inch Aggregate Base (8" thickness)	TON	3,800	\$ 40.00	\$ 152,000.00	9.9%
14	Aggregate Shoulders (12" thickness)	TON	1,250	\$ 40.00	\$ 50,000.00	3.2%
15	Level 3, 1/2 Inch ACP Mixture (4" thickness)	TON	2,500	\$ 120.00	\$ 300,000.00	19.5%
16	Extra for Asphalt Driveway Approaches (assume 2 each for BPA/PGE)	EA	4	\$ 1,500.00	\$ 6,000.00	0.4%
17	Concrete Curbs, Mountable - Islands and Shoulders	FT	0	\$ 28.00	\$ -	0.0%
18	Concrete Curbs, Mountable - Truck Apron	FT	0	\$ 28.00	\$ -	0.0%
19	Concrete Curbs, 6 Inch Exposure, High Strength Modified	FT	0	\$ 50.00	\$ -	0.0%
20	Stamped Concrete, 6 Inches Thick, Concrete Surfacing	SF	0	\$ 12.00	\$ -	0.0%
21	Stamped Concrete, 8 Inches Thick, Concrete Surfacing	SF	0	\$ 14.00	\$ -	0.0%
22	Bicycle Exit Ramp, Concrete Surfacing	SF	0	\$ 15.00	\$ -	0.0%
23	Pole Foundations	LS	1	\$ 7,850.00	\$ 7,850.00	0.5%
24	Switching, Conduit, And Wiring	LS	1	\$ 30,000.00	\$ 30,000.00	1.9%
25	Permanent Seeding	AC	2.0	\$ 5,000.00	\$ 10,000.00	0.6%
26	Landscaping	LS	0	\$ -	\$ -	0.0%
27	Fencing	FT	0	\$ 50.00	\$ -	0.0%
28	Restore Uneeded Road	LS	1.0	\$ 50,000.00	\$ 50,000.00	3.2%
29			0	\$ -	\$ -	0.0%
30			0	\$ -	\$ -	0.0%
SUBTOTAL					\$ 1,538,550.00	

SUBTOTAL CONSTRUCTION		\$ 1,538,550.00
CONTINGENCIES	30%	\$ 461,565.00
TOTAL CONSTRUCTION		\$ 2,000,115.00

Attachment 8

**DESCHUTES COUNTY: Lower Bridge Way / 43rd Street Intersection
Construction Estimate (Concept Level) - September 29, 2023
Option 3 - Roundabout**

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL	% OF SUBTOTAL
1	Mobilization	LS	1	\$ 150,000.00	\$ 150,000.00	9.3%
2	Temporary Work Zone Traffic Control, Complete	LS	1	\$ 200,000.00	\$ 200,000.00	12.4%
3	Erosion Control	LS	1	\$ 10,000.00	\$ 10,000.00	0.6%
4	Construction Survey Work	LS	1	\$ 30,000.00	\$ 30,000.00	1.9%
5	Signing & Striping	LS	1	\$ 59,000.00	\$ 59,000.00	3.7%
6	Removal of Surfacings	SY	4,200	\$ 7.00	\$ 29,400.00	1.8%
7	Asphalt Pavement Saw Cutting	FT	100	\$ 5.00	\$ 500.00	0.0%
8	Removal of Fences (no existing fencing)	LF	0	\$ 5.00	\$ -	0.0%
9	Clearing and Grubbing	LS	1	\$ 10,000.00	\$ 10,000.00	0.6%
10	General Excavation	CY	4,500	\$ 50.00	\$ 225,000.00	14.0%
11	Stormwater Management - WQ Swales	SY	400	\$ 100.00	\$ 40,000.00	2.5%
12	Stormwater Management - Inlets, 8" pipe at RAB, and 18" pipe extension w/ headwall	LS	1	\$ 80,000.00	\$ 80,000.00	5.0%
13	3/4 Inch - 0 Inch Aggregate Base	TON	2,050	\$ 40.00	\$ 82,000.00	5.1%
14	Aggregate Shoulders (12" thickness)	TON	1,250	\$ 40.00	\$ 50,000.00	3.1%
15	Level 3, 1/2 Inch ACP Mixture (4" - 8.5" variable thickness)	TON	2,350	\$ 120.00	\$ 282,000.00	17.5%
16	Extra for Asphalt Driveway Approaches (assume 1 for south edge)	EA	1	\$ 1,500.00	\$ 1,500.00	0.1%
17	Concrete Curbs, Mountable - Islands and Shoulders	FT	2,450	\$ 28.00	\$ 68,600.00	4.3%
18	Concrete Curbs, Mountable - Truck Apron	FT	350	\$ 28.00	\$ 9,800.00	0.6%
19	Concrete Curbs, 6 Inch Exposure, High Strength Modified	FT	240	\$ 50.00	\$ 12,000.00	0.7%
20	Stamped Concrete, 6 Inches Thick, Concrete Surfacing	SF	4,300	\$ 12.00	\$ 51,600.00	3.2%
21	Stamped Concrete, 8 Inches Thick, Concrete Surfacing	SF	4,700	\$ 14.00	\$ 65,800.00	4.1%
22	Bicycle Exit Ramp, Concrete Surfacing	SF	400	\$ 15.00	\$ 6,000.00	0.4%
23	Pole Foundations	LS	1	\$ 47,000.00	\$ 47,000.00	2.9%
24	Switching, Conduit, And Wiring	LS	1	\$ 71,000.00	\$ 71,000.00	4.4%
25	Permanent Seeding	AC	1.0	\$ 5,000.00	\$ 5,000.00	0.3%
26	Landscaping	LS	1	\$ 25,000.00	\$ 25,000.00	1.6%
27	Fencing	FT	0	\$ 50.00	\$ -	0.0%
28		AC	0.0	\$ -	\$ -	0.0%
29		LS	0	\$ -	\$ -	0.0%
30		FT	0	\$ -	\$ -	0.0%
SUBTOTAL					\$ 1,611,200.00	

SUBTOTAL CONSTRUCTION **\$ 1,611,200.00**
CONTINGENCIES **30%** **\$ 483,360.00**
TOTAL CONSTRUCTION **\$ 2,094,560.00**

Attachment 9

NW Lower Bridge Way / NW 43rd Street Intersection

February 2024



**Harper
Houf Peterson
Righellis Inc.**
ENGINEERS • PLANNERS
LANDSCAPE ARCHITECTS • SURVEYORS

Option 1	Option 2	Option 3
Extended Right Turn Channelization	Realignment	Roundabout

PRELIMINARY EVALUATION CRITERIA

TRAFFIC OPERATIONS AND SAFETY

1. Traffic Operations (v/c and LOS)	3rd	2nd	1st
2. Vehicle and Bicycle Safety	3rd	2nd	1st

IMPACTS

3. ROW / BLM Impacts		2nd (2.8 acres)	1st (1.9 acres)
4. BPA Impacts		2nd	1st
5. PGE Impacts		2nd	1st
6. Pacific Power Impacts		1st (tie)	1st (tie)

CONSTRUCTABILITY / COST

Stormwater Management		1st (n/a)	1st (n/a)
Construction Staging		2nd	1st
Construction Cost		1st (~ \$2,000,000)	2nd (~ \$2,095,000)

PUBLIC OUTREACH

Open House / Community Feedback		Pending	Pending
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