Dylan Monke

From: Chris OKeefe
Sent: Thursday, December 7, 2023 4:27 PM
To: Dylan Monke; Russell Clark
Subject: RE: Shadow Mountain Special Use Application Resubmittal - Request

Follow Up Flag: Follow up
Flag Status: Flagged

Hello Dylan,
Based on the fact that the applicant enquired about getting an extension on December 1st and has now submitted additional rationale in support of their extension request, I am comfortable granting a 180 day extension. I find that there is good cause for this extension request including difficulty scheduling meetings with Planning and Zoning staff, the need to update complex reports required for the process and the need for additional reports not required for the first referral. It appears that the applicant has been working diligently to complete their referral response.
Please let me know if you need additional information.
Chris

Chris O'Keefe, AICP
(he, him, his)
Planning and Zoning Director
Jefferson County
o 303-271-8713
cokeefe@jeffco.us | Find us on the web: planning.jeffco.us

We encourage scheduling an appointment to see staff during our office hours Monday - Thursday. Please schedule appointments and submit applications online. Go to planning.jeffco.us for more information.

JEFFERSON COUNTY COLORADO

From: Dylan Monke <dmonke@co.jefferson.co.us>
Sent: Thursday, December 7, 2023 1:07 PM
To: Russell Clark <rclark@co.jefferson.co.us>; Chris OKeefe <cokeefe@co.jefferson.co.us>
Subject: FW: Shadow Mountain Special Use Application Resubmittal - Request

FYI

Dylan Monke
Jefferson County Planning and Zoning
Permitting Supervisor
303-271-8718
dmonke@jeffco.us | planning.jeffco.us

We encourage scheduling an appointment to see staff during our office hours Monday - Thursday. Please schedule appointments and submit applications online. Go to planning.jeffco.us for more information.

From: Melanie McKenzie <mmckenzie@segroup.com>
Sent: Thursday, December 7, 2023 1:01 PM
To: Dylan Monke <dmonke@co.jefferson.co.us>
Cc: Travis Beck <tbeck@segroup.com>; Phil Bouchard <phil@shadowmountainbikepark.com>; Jason Evans <jason@shadowmountainbikepark.com>; Jenkins, Diana C. <djenkins@ottenjohnson.com>
Subject: --{EXTERNAL}-- RE: Shadow Mountain Special Use Application Resubmittal - Request

Dylan,
Thank you for the clarification. Attached is the formal request letter.
Best,

Melanie McKenzie (she/her)
Analyst & Planner
646.438.5607

SE GROUP
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From: Dylan Monke <dmonke@co.jefferson.co.us>
Sent: Tuesday, December 5, 2023 11:55 AM
To: Melanie McKenzie <mmckenzie@segroup.com>
Cc: Travis Beck <tbeck@segroup.com>
Subject: RE: Shadow Mountain Special Use Application Resubmittal - Request

Melanie,

We recognize that some agencies take time beyond our response, but the 180-day is taken from our formal response to the applicant, not individual responses beyond.
Our Director has asked for your formal extension request letter by close of business on December 11.

Thanks,

Dylan Monke
Jefferson County Planning and Zoning
Permitting Supervisor
303-271-8718
dmonke@jeffco.us | planning.jeffco.us

We encourage scheduling an appointment to see staff during our office hours Monday - Thursday. Please schedule appointments and submit applications online. Go to planning.jeffco.us for more information.

From: Melanie McKenzie <mmckenzie@segroup.com>
Sent: Friday, December 1, 2023 9:08 AM
To: Dylan Monke <dmonke@co.jefferson.co.us>
Cc: Travis Beck <tbeck@segroup.com>
Subject: --{EXTERNAL}-- RE: Shadow Mountain Special Use Application Resubmittal - Request

Hi Dylan,
First, to clarify, the language states that “The applicant shall submit electronically a revised application in response to referral comments within 180 calendar days after referral comments are provided to the applicant.” The last referral comment we received was dated June 13, 2023 from USFWS. This puts our response deadline (180 days later) at December 10. Is this consistent with your records?
Thank you,

Melanie McKenzie (she/her)
Analyst & Planner
646.438.5607

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[segroup.com]

From: Dylan Monke <dmonke@co.jefferson.co.us>
Sent: Thursday, November 30, 2023 5:02 PM
To: Melanie McKenzie <mmckenzie@segroup.com>
Cc: Travis Beck <tbeck@segroup.com>
Subject: RE: Shadow Mountain Special Use Application Resubmittal - Request

Melanie,

Can you provide me more information on what reports are being updated?
Something formal is preferred as these are reviewed and ultimately approved by our Director after staff review.

Thanks,

Dylan Monke
Jefferson County Planning and Zoning
Permitting Supervisor
303-271-8718
dmonke@jeffco.us | planning.jeffco.us

We encourage scheduling an appointment to see staff during our office hours Monday - Thursday. Please schedule appointments and submit applications online. Go to planning.jeffco.us for more information.

From: Melanie McKenzie <mmckenzie@segroup.com>
Sent: Thursday, November 30, 2023 4:32 PM
To: Dylan Monke <dmonke@co.jefferson.co.us>
Cc: Travis Beck <tbeck@segroup.com>
Subject: --{EXTERNAL}-- Shadow Mountain Special Use Application Resubmittal - Request

Hi Dylan,
As mentioned last week, we have been aiming to resubmit the SMBP application by tomorrow, 12/1. We understand that staff requests a response 180 days after referral comments are provided to the applicant, as described in the June 5 first submittal response letter from Planning and Zoning and in the Land Development Regulation.
We are working diligently to address all comments received and we are requesting an extension to ensure that we comprehensively address all comments. Please confirm that the County has no concern with granting this extension and let us know if you'd prefer this extension request formalized in a letter from our legal counsel.
Thank you.
Best,

Melanie McKenzie (she/her)
Analyst & Planner
646.438.5607

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[segroup.com]

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December 8, 2023

Jefferson County – Planning and Zoning
100 Jefferson County Parkway, Suite 3550
Golden, CO 80419
Attn: Dylan Monke, Planner

Re: Shadow Mountain Bike Park - Case No. Case No. 23-102980 RZ

Dear Mr. Monke,

We are in receipt of the Referral Agency List, dated March 17, 2023. As part of the first referral of the application for a special use for the Shadow Mountain Bike Park project (the "**Application**"), we understand that the following agencies were provided with the opportunity to comment on the Application:

- Army Corps of Engineers - kiel.g.downing@usace.army.mil;
- CDOT Mountains - bradley.Sheehan@state.co.us;david.dixon@state.co.us;
- CDPHE (Colo Health) - cdphe_localreferral@state.co.us;
- Cartography - khagaman@jeffco.us;
- Colorado Natural Gas - jgutierrez@summitutilitiesinc.com;
- Colorado Parks and Wildlife NERO - Mountains - mark.lamb@state.co.us;
- Colorado State Forest Service - matt.piscopo@colostate.edu;
- Colorado State Land Board - greg.ochis@state.co.us;
- Comcast - Alfonzo_Martinez@cable.comcast.com;
- Current Planning - SHUTCHIN@jeffco.us[1]
- DRCOG - asummers@drcog.org;gchiapella@drcog.org;
- Division of Water Resources - sarah.brucker@state.co.us;joanna.williams@state.co.us;
- Elk Creek Fire Protection - rparker@elkcreekfire.org;jware@elkcreekfire.org;
- Geologist - poconnel@jeffco.us;
- IREA
- Historical Commission
- LUMEN - platreview@lumen.com;
- Long Range - hgutherl@jeffco.us;
- Open Space - nyork@jeffco.us;estoner@co.jefferson.co.us;
- Planning Engineering - NSEYMOUR@jeffco.us
- Public Health - publichealthehlanduse@jeffco.us;
- Road & Bridge 4 - kdean@jeffco.us;
- Transportation and Engineering - ltownsen@co.jefferson.co.us;mvanatta@co.jefferson.co.us;
- United Power Inc - platreferral@unitedpower.com;
- XCEL Energy - donna.L.George@xcelenergy.com;

[1] We understand this item to refer to the Planning and Zoning comments.

We have not received comments from the following:

- Army Corps of Engineers - kiel.g.downing@usace.army.mil;
- Cartography - khagaman@jeffco.us;
- Colorado State Land Board - greg.ochis@state.co.us;
- Comcast - Alfonzo_Martinez@cable.comcast.com;
- DRCOG - asummers@drcog.org;gchiapella@drcog.org;
- IREA
- LUMEN - platreview@lumen.com;

Of the comments received, we have addressed each of the Referral Comments on the table set forth in the following pages. The following items have been prepared or updated since the initial Application submittal, and are included in this resubmittal package:

1. First Referral Response – Summary of Referral Comments – SMBP (this document)
2. First Referral Response – Planning & Zoning – SMBP
3. Written Restrictions/ODP
    a. Updated Item 2: Official Development/Special Use/Site Approval Plan [satisfies Zoning Resolution Section 9.B., Item 10] as described in the initial Application submittal
4. Engineering Study for Water System Improvements
    a. Updated Item 12: Water [satisfies Zoning Resolution Section 9.B., Item 21] as described in the initial Application submittal
5. Wildfire Hazard Mitigation Plan
    a. Updated Item 14: Fire Protection [satisfies Zoning Resolution Section 9.B., Item 23] as described in the initial Application submittal
6. First Referral Response – Transportation and Engineering – SMBP
    a. Includes updated Item 15: Transportation Analysis [satisfies Zoning Resolution Section 9.B., Item 27] as described in the initial Application submittal
7. Visual Analysis
    a. Updated Item 23: Visual Analysis [satisfies Zoning Resolution Section 9.B., Item 17] as described in the initial Application submittal
8. Vegetation Preservation Plan
    a. Updated Item 25: Vegetation Preservation Plan [satisfies Zoning Resolution Section 9.B., Item 19] as described in the initial Application submittal
9. Sensory Impact Assessment
    a. Includes Item 28: Sensory Impact Report/Plan [satisfies Zoning Resolution Section 9.B., Item 33], in addition to initial Application submittal
10. First Referral Response – CPW – SMBP
    a. Includes updated Item 29a: Wildlife Summary [Satisfies LDR Section 4.B., Item 31] as described in the initial Application submittal
11. First Referral Response – Historical Commission – SMBP
    a. Includes Item 30: Historical, Archaeological, and Paleontological Report/Plan [Satisfies Land Development Regulation Section 4.B., Item 36] in addition to initial Application submittal

12. First Referral Response – Long Range Planning - SMBP

We look forward to your continued cooperation in connection with the Application. Please do not hesitate to reach out should you have any questions or require additional information.

Sincerely,

Phil Bouchard
Shadow Mountain Bike Park

Jason Evans
Shadow Mountain Bike Park

Agency	REFERRAL COMMENTS	APPLICANT RESPONSE
CDOT	Received the following summarized comment, dated March 24, 2034: • This property is off the State Highway System; no objections or concerns.	No response needed.
Colorado Natural Gas	Received the following summarized comment, dated March 20, 2023: • Colorado Natural Gas has no existing assets within the Property; no objections or concerns.	No response needed.
Colorado Parks and Wildlife	Received comments dated March 21, 2023.	See "First Referral Response – CPW – SMBP."
Colorado State Forest Service	Received the following summarized comment, dated April 5, 2023: • A Wildfire Mitigation Plan is recommended. • CSFS requests an analysis / technical documentation for the installed equipment on the property (ie. chairlift) as it relates to the probability of starting fires.	The requested Wildfire Mitigation Plan, titled "Shadow Mountain Bike Park Wildfire Mitigation Hazard Plan" is submitted with this 1st Re-submittal. The Applicant asked for clarification on the requested analysis / technical documentation for the equipment with CSFS contacts John White and Hilary Hiett. In an August 8, 2023 email correspondence, the CSFS indicated that they "will not require the analysis on the probability of the infrastructure starting a fire," so there is no response required regarding this request.
Current Planning	Received First Referral Response Letter dated June 5, 2023.	See "First Referral Response – Planning & Zoning – SMBP"
Division of Water Resources	Received the following summarized comment, dated March 20, 2023: • The application does not quality as a "subdivision" and therefore the office has only prepared a cursory review of information and is not	No response needed.

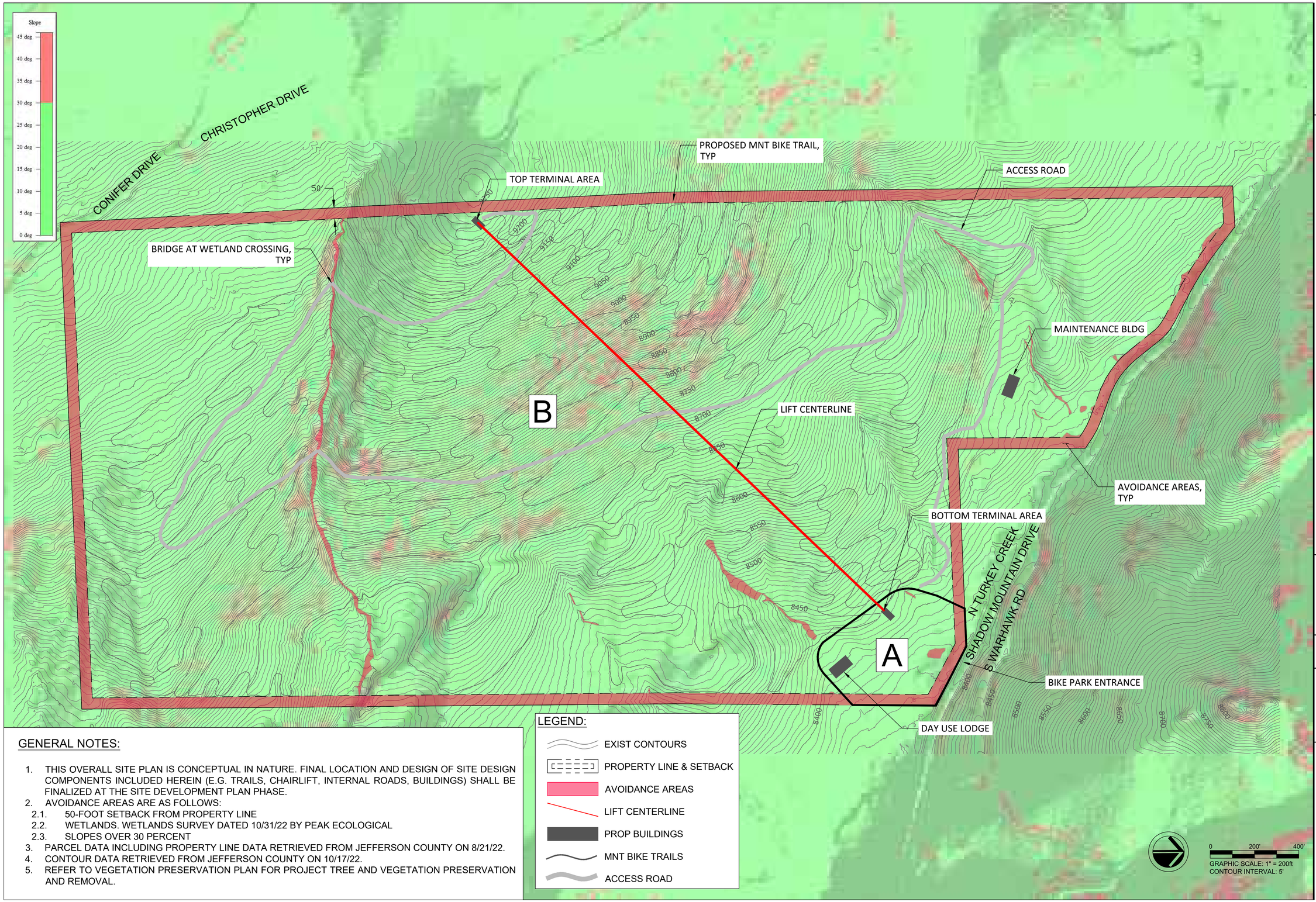
Agency	REFERRAL COMMENTS	APPLICANT RESPONSE
	commenting on the adequacy of water supply or availability • Well permit (s) and the allowed use(s) will be determined at the time permit application(s) are submitted to and reviewed by the State Engineer's Office • The Applicant is advised to review the requirements and guidelines applicable to the proposed detention pond on the Property, and may be subject to administration by the DWR office if some are not met • For any construction or activities that may temporarily disturb or fill any wetlands on site, the Applicant may need to obtain a permit from the U.S. Army Corps of Engineers	
Elk Creek Fire Protection	Received the following summarized comment, dated March 20, 2023: • Access roads would need to be designed in accordance with the International Fire Code, Section 503 • Fire protection water supply would need to be designed in accordance with the International Fire Code, Section 507 • Minimum fire protection water supply for proposed buildings should be 180,000 gallons; the current proposed 15,000-gallon water tank does not meet these requirements • A fire flow report will need to be provided based on the proposed structures • One to three fire hydrants may be required depending on the proposed buildings	The requested fire protection water supply and storage have been incorporated into the Engineering Study for Water System Improvements, included in this resubmittal. From correspondence on 8/25/2023 between the Applicant and Elk Creek Fire Protection, it was agreed that the fire flow report will be provided at the SDP phase. Other design measures, including fire hydrants and locations, fire pump, and building alarm system will be determined at the SDP phase. Design will be finalized in accordance with the International Fire Code, as referenced in the comment.

Agency	REFERRAL COMMENTS	APPLICANT RESPONSE
	• A fire pump may be required depending on the proposed buildings and water system • A building fire alarm system may be required in accordance with the International Fire Code, Section 907	
Geologist	Received the following summarized comment, dated April 12, 2023: • A geologist report is not required with the rezoning process • The water requirements are not anticipated to exceed the threshold required for an Aquifer Test as described in Section 21 of the LDR • Legal water rights will be required with the SDP process • Square footage of buildings will be required to finalize the Water Availability Analysis (WAA) • Grading within the Jefferson County Floodplain Overlay District will require a separate Floodplain Development Permit	Comments are noted. Refer to the ODP Written Restrictions for building square footage maximums.
Historical Commission	Received the following summarized comment, dated May 19, 2023: • There are no recorded cultural resource surveys and sites within the Property • No determination of effect or mitigation measures can be provided because no resources are recorded in the project area • Recommendation 1: Consider impacts to "historic, archaeological, and paleontological resources" with a records search, consultation with the Conifer Historical Society, or an on-the-ground survey • Recommendation 2: Consider how to preserve the cultural, historical,	Refer to "First Referral Response – Historical Commission – SMBP"

Agency	REFERRAL COMMENTS	APPLICANT RESPONSE
	and agricultural/ranching heritage of the area	
Long Range	Received Long Range Review Memo dated May 5, 2023.	Refer to "First Referral Response – Long Range Planning – SMBP."
Open Space	Received the following summarized comment, dated April 10, 2023: • No Comment.	No response needed.
Planning Engineering	Received Planning Engineering Memorandum dated April 10, 2023.	Refer to "First Referral Response – Traffic and Engineering – SMBP."
Public Health	Received the following summarized comment, dated March 22, 2023: • Water: The applicant should determine legal rights to water supply through the Colorado Division of Water Resources. The Applicant should contact the Water Quality Control Division to discuss water quality for the project. • Wastewater: Using Jefferson County Onsite Wastewater Regulations, the anticipated gallons of wastewater per day would be approximately 1,800 gpd. A permit from Jefferson County Public Health is necessary prior to installation of the treatment system. If there are multiple systems onsite, or if the average daily flow is over 2,000 gpd, the system would need to be evaluated by the Colorado Department of Public Health and Environmental. • Environmental Assessment: No recognized environmental conditions exist which would negatively impact the property. • Regulated Facilities: Food Trucks must have a valid Colorado Retail	Water: The Applicant will review legal rights and water quality within the SDP. Wastewater: Noted. The Applicant will obtain a permit and complete necessary review processes prior to installation of wastewater systems. Environmental Assessment: Noted. Regulated Facilities: Noted. Maintenance Facilities: Noted. Air: Noted. The Fugitive Dust Control Plan will be completed within the SDP. Noise: Refer to the Sensory Impact Assessment.

Agency	REFERRAL COMMENTS	APPLICANT RESPONSE
	Food Establishment License for Mobile Units. • Maintenance Facilities: Above-ground storage fuel tanks with 660-40,000 gallons capacity and associated infrastructure are regulated by Colorado Department of Labor and Employment, Division of Oil, Public Safety, and may be regulated by the local fire department. Onsite disposal is prohibited for hazardous materials or waste from repair operations. • Air: This Project may require an air permit. A Fugitive Dust Control Plan will be required. • Noise: Commercial noise standards were identified.	
Road & Bridge 4	Received the following summarized comment, dated March 20, 2023: • No issues identified; however, impacts of the development should be analyzed for the intersections of CR 73 and Pleasant Park Road or Barkley Road and the on and off ramp of Hwy 285.	In a meeting on August 16, 2023 with Nathan Seymour (Planning Engineer), Kelly Dunne (Traffic Operations Manager), and Dylan Monke (Case Manager), it was determined that these intersections may be analyzed in the Transportation Impact Study that will be prepared with the SDP and do not need to be included in this resubmittal. This was confirmed in email correspondence from the Case Manager on 9/14/2023, after he spoke with Keith Dean.
Transportation and Engineering	Received the following summarized comment, dated March 24, 2023: • No concerns about the Right-of-Way • Included a summary of Planning Engineering comments	Refer to "First Referral Response – Traffic and Engineering – SMBP" for a response to the Planning Engineering comments.
United Power Inc	Received the following summarized comment, dated March 20, 2023: • This property is outside the United Power service area; unable to comment.	No response needed.

Agency	REFERRAL COMMENTS	APPLICANT RESPONSE
XCEL Energy	Received the following summarized comment, dated March 28, 2023: • No conflict.	No response needed.
USFW	Received the following summarized comment, dated June 13, 2023: • The Service has reviewed your Shadow Mountain bike park project in Jefferson County and has no concerns with this project resulting in impacts to species listed as proposed, threatened, or endangered.	No response needed.



GENERAL NOTES:

1. THIS OVERALL SITE PLAN IS CONCEPTUAL IN NATURE. FINAL LOCATION AND DESIGN OF SITE DESIGN COMPONENTS INCLUDED HEREIN (E.G. TRAILS, CHAIRLIFT, INTERNAL ROADS, BUILDINGS) SHALL BE FINALIZED AT THE SITE DEVELOPMENT PLAN PHASE.
2. AVOIDANCE AREAS ARE AS FOLLOWS:
   - 2.1. 50-FOOT SETBACK FROM PROPERTY LINE
   - 2.2. WETLANDS. WETLANDS SURVEY DATED 10/31/22 BY PEAK ECOLOGICAL
   - 2.3. SLOPES OVER 30 PERCENT
3. PARCEL DATA INCLUDING PROPERTY LINE DATA RETRIEVED FROM JEFFERSON COUNTY ON 8/21/22.
4. CONTOUR DATA RETRIEVED FROM JEFFERSON COUNTY ON 10/17/22.
5. REFER TO VEGETATION PRESERVATION PLAN FOR PROJECT TREE AND VEGETATION PRESERVATION AND REMOVAL.

LEGEND:

- EXIST CONTOURS
- PROPERTY LINE & SETBACK
- AVOIDANCE AREAS
- LIFT CENTERLINE
- PROP BUILDINGS
- MNT BIKE TRAILS
- ACCESS ROAD

SE GROUP
323 West Main Street, Suite 202
Frisco, CO 80443
tel: 970.668.3398
www.segroup.com

SHADOW MOUNTAIN BIKE PARK

CONIFER, COLORADO

Not For Construction

ISSUE
SCHEMATIC DESIGN

RELEASE DATE
December 23

REVISIONS

PROJECT NO.	22089001
MADE BY	OD
REVIEWED BY	OD

OVERALL SITE PLAN

C1.0

December 8, 2023

Jefferson County – Planning and Zoning
100 Jefferson County Parkway, Suite 3550
Golden, CO 80419
Attn: Dylan Monke, Planner

Re: Shadow Mountain Bike Park - Case No. Case No. 23-102980 RZ

Dear Mr. Monke,

We are in receipt of the First Referral Response Letter from Jefferson County Planning and Zoning, dated June 5, 2023, as part of the first referral of the application for a special use for the Shadow Mountain Bike Park project (the "**Application**"). With this letter, we are providing the following responses to comments received.

I. General

Comment 1. *The submitted Written Restrictions do not clearly define the maximum impact of the proposed use nor the visual or audial impacts of the proposed park. The applicant will be required to provide a number of additional details to refine compatibility, visual impacts, proposed use, noise, wildfire hazards, and site design.*

Response: Noted and additional details are provided in the Written Restrictions provided with this submittal package.

Comment 2. *The applicant's proposal would not meet with the Conifer/285 Corridor Area Plan recommended land use for this site. The Comprehensive Master Plan recommends this area for 1 dwelling unit per 10 acres. Staff evaluated the following three factors when assessing proposed uses that are not supported by the Plan:*

a) *how will the impacts associated with the proposed land use(s) be mitigated compared with the recommended Land Uses;*

b) *are the proposed land uses compatible with the surrounding Land Use Recommendations and community character; and*

c) *what change of circumstance has occurred in the local area since the Land Use Recommendation was adopted.*

Response: See "First Referral Response – Long Range Planning – SMBP" where this comment is addressed in detail.

II. ODP Document

Comment 1. *Land Use Area Definitions - Day Lodge is not limited by size and includes notions of, "other services, Other Entertainment" that need to be more clearly defined. These limitations should have matching evaluations in trip generation, wastewater and other supporting documents.*

Response: The applicant has removed the reference to "other services" from the Written Restrictions and added maximum building square footage for Use Area A in which the Day Lodge will be located.

Comment 2. *Permitted Uses - Some of the proposed language seems vague. It is unclear how the park will be used during "closure" periods, maximum impact of some of the proposed uses and how the features on site will be limited. See Proposed Written Restrictions for full staff comments.*

Response: The Written Restrictions now clarify that Shadow Mountain Bike Park will be closed to guests during the Seasonal Closure (as in, there will be no regular business hours during which guests may use the Shadow Mountain Bike Park). Please note that the applicant intends to permit special events during the Seasonal Closure, pursuant to the County's Special Event Permit process.

Comment 3. *Setbacks- No setbacks are proposed beyond the typical A-2 standards. However, wildfire mitigation recommends 300- foot setbacks from property lines, this is strongly recommended by staff. Other setbacks may include distances from property lines "trails 30-foot from property lines" either written by cardinal direction or illustrated as "Non-Disturbance Areas" graphically on Page 5 of the submitted Written Restrictions supporting pages.*

Response: The Written Restrictions now integrate setbacks, including a 50 foot setback for vertical development (buildings), bike trails, and the Access Road from the Property boundaries. Additionally, non-disturbance areas are illustrated on the Site Plan.

Comment 4. *Parking Standards - No building maximum is proposed with this document. Maximum building size, occupancy and parking ratio are required to evaluate maximum impacts of use, parking, transportation, water and wastewater. Justification on how the proposed lot is compatible with surrounding residential uses is required.*

Response: The Written Restrictions now integrate maximum building square footage for each Use Area, maximum occupancy at Shadow Mountain Bike Park, and a maximum number of parking spaces to be provided. The applicant has not integrated a parking ratio due to the nature of the use being primarily outdoors. Comparable uses, like "Active Recreational Uses" do not have a defined parking ratio, but instead are addressed by Special Review. See Zoning Resolution Section 14.D. The applicant proposes a maximum of 320 parking spaces. If staff would prefer to see a parking ratio or parking minimum, we would be happy to discuss this item further.

Comment 5. *Site Mitigation - More could be done to meet the Temporary Area of Refuge and other recommendations of the Wildfire Risk Assessment. For instance, the proposed location of the parking*

lot makes it unable to meet these recommendations on-site. Similarly, staff has concerns with parking lot proposed over existing wetland, floodplain areas and in close proximity to property lines.

Response: The Applicant has prepared a Wildfire Hazard Mitigation Plan, included with this resubmittal package. The recommendations within the Plan have been incorporated into the ODP Written Restrictions and Site Plan. Additionally, the Applicant has included additional restrictions around developing over wetlands. Refer to the ODP Written Restrictions included in this resubmittal package.

Comment 6. *Please review the attached ODP document with red marks related to formatting and content.*

Response: Noted.

III. Plan Recommendation

Comment 1. *The subject property is located within the Conifer/285 Corridor Plan. Area 14 is recommended for residential development at 5 to 12 dwelling units per acre.*

Response: Noted.

IV. Traffic & Engineering

Comment 1. *This land use does not align with a trip generation code identified in the ITE 10th editions. Greater justification for 1.5 turnover of vehicles per day using data collected from similar land uses is required.*

Response: Please see "First Referral Response – Planning Engineering – SMBP" for detailed response.

Comment 2. *Saturday and Sunday PM periods were not analyzed and will be required to be evaluated for the 2nd referral.*

Response: Please see "First Referral Response – Planning Engineering – SMBP" for detailed response.

Comment 3. *The County does not support the use of left turn acceleration lanes. Revise Table 1a, 1b and other places in the report which show a mitigated level of service.*

Response: Please see "First Referral Response – Planning Engineering – SMBP" for detailed response.

Comment 4. *Provide a justification for 1% annual growth rate used for future traffic projections in 2025 and 2042.*

Response: Please see "First Referral Response – Planning Engineering – SMBP" for detailed response.

Comment 5. *Per the narrative, the applicant will work with local Sheriff and/or Road and Bridge authority within ROW to enforce no-parking along Shadow Mountain Drive. Please describe the type of work that the applicant is committing to provide.*

Response: Please see "First Referral Response – Planning Engineering – SMBP" for detailed response.

Comment 6. *Engineering will require surface of roads or parking lots removed from Written Restrictions. If approved, these details are to be evaluated with Site Development Plan and Land Development Regulations processes. The applicant is advised to be aware that parking lots and roads exceeding 150 trips per day are required to be paved.*

Response: Noted.

V. Documents required for second submittal.

1. Revised ODP and Written Restrictions – See ODP Written Restrictions
2. Cover Letter addressing conformance with the Comprehensive Master Plan – See conformance discussion in "First Referral Response – Long Range Planning – SMBP"
3. Sensory Impact Study – See Sensory Impact Assessment
4. Revised Transportation Information including maximum building limitations, similar land use data – See "First Referral Response – Planning Engineering – SMBP"
5. A Wildfire Mitigation Plan as well as an Analysis/Technical documentation for the chairlift as it relates to the probability of starting fires satisfactory to the CSFS Golden Field Office – See Wildfire Mitigation Plan. The Applicant asked for clarification on the requested analysis / technical documentation for the equipment with CSFS contacts John White and Hilary Hiett. In an August 8, 2023 email correspondence, the CSFS indicated that they "will not require the analysis on the probability of the infrastructure starting a fire," so there is no response regarding this request.
6. Updated Visual Analysis – See Visual Analysis.

Sincerely,

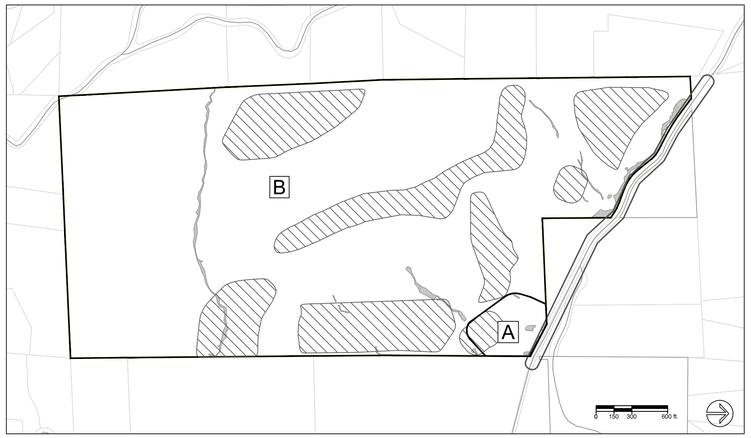
Phil Bouchard
Shadow Mountain Bike Park

Jason Evans
Shadow Mountain Bike Park

Shadow Mountain Bike Park
OFFICIAL DEVELOPMENT PLAN

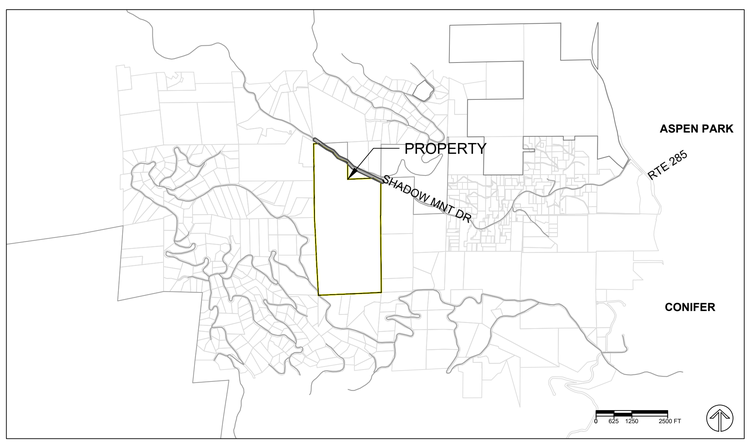
CASE NUMBER: 23-102980 RZ

S2NW, SW, AND A FRACTIONAL PART OF THE NWNW (S OF SHADOW MOUNTAIN DRIVE)
IN SECTION 16, TOWNSHIP 6 SOUTH, RANGE 71 WEST, OF THE 6TH PRINCIPAL MERIDIAN
COUNTY OF JEFFERSON, STATE OF COLORADO



WILDFIRE HAZARD MITIGATION PLAN TREATMENT AREAS
WETLANDS

USE AREAS
SCALE 1"=600'



VICINITY MAP
SCALE 1"=2500'

LEGAL DESCRIPTION

S2NW, SW, and a fractional part of the NWNW (S of Shadow Mountain Drive) in Section 16, Township 6 South, Range 71 West, of the 6th Principal Meridian.

APPROVED FOR RECORDING:

This Special Use Document, titled Shadow Mountain Bike Park, was approved the _____ day of _____ 2023, by the Board of County Commissioners, of the County of Jefferson, State of Colorado and is approved for recording.

The owner of the property, at the time of approval was: State of Colorado

By: Jefferson County Planning and Zoning Director

Signature: _____

Date: _____

CLERK AND RECORDER'S CERTIFICATE

Accepted for filing in the Office of the County Clerk and Recorder of Jefferson County at Golden, Colorado, this _____ day of _____ , 20 _____.

_____ _____

County Clerk and Recorder Deputy Clerk

STANDARD FLEXIBILITY STATEMENT

The graphic drawing contained within this Official Development Plan is intended to depict general locations and illustrate concepts of the textual provisions of this Official Development Plan. During the plotting or Site Development Plan process the Planning and Zoning director may allow minor variations for the purpose of establishing:

A. Final road alignments
B. Final configuration of lot and tract sizes and shapes
C. Final building envelopes
D. Final access and parking locations
E. Landscaping adjustments

APPLICABILITY STATEMENT

Except as expressly provided otherwise in this Official Development Plan, development of this property shall conform to the Jefferson County Zoning Resolution in effect at the time of platting, Site Development Plan, and building permit application.

OWNER'S CERTIFICATE

We, Colorado State Land Board, as owners of the land affected by this Planned Development, accept and approve all conditions set forth.

_____

Abraham Medina
Recreation Program Manager
State Land Board

Accepted for filing in the Office of the County Clerk and Recorder of Jefferson County at Golden, Colorado, this ___ day of _____ , 20 _____.

_____
County Clerk and Recorder

_____
Deputy Clerk

DATE	ISSUED FOR	REVISION #

PREPARED BY:

SE GROUP, INC.
323 W MAIN ST, SUITE 202
FRISCO, CO 80443
970.668.2729

Shadow Mountain Bike Park
OFFICIAL DEVELOPMENT PLAN

CASE NUMBER: 23-102980 RZ

S2NW, SW, AND A FRACTIONAL PART OF THE NWNW (S OF SHADOW MOUNTAIN DRIVE)
IN SECTION 16, TOWNSHIP 6 SOUTH, RANGE 71 WEST, OF THE 6TH PRINCIPAL MERIDIAN
COUNTY OF JEFFERSON, STATE OF COLORADO

WRITTEN RESTRICTIONS

A. **Intent**. The purpose of this Special Use is to permit a Class III Commercial Recreation Facility use on the subject property described in the Legal Description (the "Property"), which is zoned Agricultural-Two (A-2).

B. **Written Restrictions**. All standards of the Agricultural Two Zone District (A-2) and other applicable sections of the Zoning Resolution shall apply to the Property, with the modifications contained herein. Capitalized terms not defined herein shall have the meanings ascribed to them in the Jefferson County Zoning Resolution.

1. **Permitted Uses**.
   - a. Primary Uses.
     - i. Class III Commercial Recreation Facility, excepting therefrom any activity that involves the use of non-domestic animals and/or firearms
   - b. Accessory Uses.
     - i. Accessory uses per the Accessory Use Section of the Zoning Resolution
     - ii. Accessory structures
     - iii. Construction Trailers during construction only, not to exceed to two years without a permitted extension
     - iv. Day Lodge
     - v. Food and beverage vendors
     - vi. Maintenance Facilities
     - vii. Parking
     - viii. Temporary storage of defensible space equipment and debris associated fuel break and forest management thinning in accordance with defensible space, fuel break and forest management programs as specified in the County Zoning Resolution and County Land Development Regulations
   - c. Temporary Uses.
     - i. Special Events, permitted by Special Event Permit
     - ii. Temporary use of land and/or associated temporary buildings for any purpose or use which is clearly incidental to the development of a permitted Primary or Accessory Use
2. **Development Standards**
   - a. Use Area A. (6 acres)
     - i. Permanent Building Standards
       1. Max Permanent Building Height: 35 feet
       2. Max Permanent Building Square Footage: 15,000 feet
       3. Setbacks: 50 feet from all Property lines
     - ii. Access Road(s) Setback: 50 feet from all Property lines
   - b. Use Area B. (229.3 acres)
     - i. Permanent Building Standards
       1. Max Permanent Building Height: 35 feet
       2. Max Permanent Building Square Footage: 5,000 square feet
       3. Setbacks: 50 feet from all Property lines
     - ii. Trail Standards
       1. Setbacks: 50 feet from all Property lines
       2. Trail clearing width: 20 feet maximum
     - iii. Chairlift Standards
       1. Max Chairlift Height: All Chairlift infrastructure (including terminals and towers) and accessory structures will not exceed 35 feet in height
       2. Setbacks: 50 feet from all Property lines
       3. Chairlift corridor clearing width: 50 feet maximum
       4. Chairlift terminals clearing: 200 feet maximum surrounding terminals
     - iv. Access Road(s) Setback: 50 feet from all Property lines
3. **Overlay Areas**.
   - a. Wildfire Hazard Mitigation Overlay. Mitigation strategies as outlined in the Wildfire Hazard Mitigation Plan will be implemented in the Wildfire Hazard Mitigation Overlay
   - b. Wetlands Overlay.
     - i. No permanent building, parking area, nor Chairlift is permitted in the Wetlands Overlay
     - ii. In the event that Trails or Access Road(s) cross the Wetlands Overlay, impacts will be mitigated by constructing such crossings using bridges, raised platforms, or similar design techniques
4. **Lighting**.
   - a. No exterior lighting is permitted in the Wetlands Overlay or Use Area B, except for lighting required in connection with the Chairlift
   - b. Lighting in Use Area A is permitted to be illuminated from one hour before to one hour after Guest Hours of Operation, except for security lighting, the use of which is not limited to certain hours
   - c. Lighting will be directed away from the Wetlands Overlay
5. **Signage**.
   - a. Individual signs will be no larger than 64 square feet
   - b. No more than one sign is permitted per building, except for Window Signs, Temporary Banner Signs, and Flags
   - c. Signs will be no closer than 50 feet from all Property lines, except for Entry Feature Sign(s) which are permitted on the Property adjacent to Shadow Mountain Drive
   - d. Signs will not be illuminated in any way
6. **Sound**. Sound levels shall adhere to maximum permissible noise levels for residential uses
7. **Fencing**.
   - a. Only wildlife friendly fencing is permitted on the Property
   - b. Wood fencing is prohibited on the Property
8. **Fires**.
   - a. Outdoor fires using wood or charcoal for fuel are prohibited.
   - b. All outdoor fires of any type are prohibited in Use Area B
9. **Trash Management**. Only wildlife-proof trash, recycling and composting containers are permitted to be used on the Property
10. **Landscaping**.
    - a. Landscaping plans will integrate Wildfire Hazard Mitigation Plan recommendations
    - b. The Property shall meet all requirements of the County's landscaping regulations, except that:
      - i. Throughout the entire Property, any tree meeting the preservation and protection criteria in the County landscaping regulations which cannot be protected or preserved is not required to be replaced
      - ii. Throughout Use Area B, existing trees shall not be shown on preservation plans and, therefore, shall not be subject to the tree preservation standards set forth in the County landscaping regulations
11. **Parking**. The maximum number of parking spaces will not exceed 320 spaces
12. **Operations**.
    - a. Guest Hours of Operation. The Shadow Mountain Bike Park will be open to guests no earlier than sunrise and no later than sunset
    - b. Seasonal Closure. The Shadow Mountain Bike Park will be closed to guests from January 1 through April 1 (the "**Seasonal Closure**")
    - c. Motorized Use.
      - i. Motorized use is prohibited on trails
      - ii. E-bikes are permitted on trails
    - d. Guest Count. The maximum number of guests visiting Shadow Mountain Bike Park in one day will not exceed 1,200 guests
13. **Definitions and Uses**
    - a. Access Road(s): Road(s) constructed of gravel or a similar material for ingress and egress to and from Use Areas A and B, as illustrated on the Overall Site Plan.
    - b. Chairlift: All infrastructure required for the operation, maintenance, and support of the lift structure, including but not limited to terminals, towers, lines, poles, chairs, electrical equipment, and other related components.
    - c. Class III Commercial Recreation Facility: A facility for the purpose of sports and recreational activities, excepting therefrom any activity that involves the use of non-domestic animals and/or firearms, which is operated or owned by a commercial enterprise and open to the general public or members for a fee in return for the provision of some recreational activity, and including all uses related to the operation thereof, which may include stand-alone food and beverage for purchase and sale from independent vendors, retail items for purchase and sale, items for rental, and bike patrol and emergency services.
    - d. Day Lodge: An indoor facility for the purpose of supporting the Class III Commercial Recreation Facility use, which may include: pre-made food and beverage for purchase and sale, retail items for purchase and sale, items for rental, administrative offices and services, bike patrol and emergency services, and relief areas related to supporting guests.
    - e. Maintenance Facilities: Operational, maintenance, and administrative services and facilities associated with the Class III Commercial Recreation Facility use.
    - f. Trails: Trails constructed for use by cyclists and, in some cases, individuals on foot or other non-motorized means of transportation.
    - g. Training Area: An outdoor area for the purpose of training bike skills, which may include: structures, jumps, ramps, and obstacles, paths made of dirt, gravel, or other natural materials, and other mechanisms for the purpose of learning or practicing bike skills.

DATE	ISSUED FOR	REVISION #

PREPARED BY:

SE GROUP, INC.
323 W MAIN ST, SUITE 202
FRISCO, CO 80443
970.668.2729

ENGINEERING STUDY
for
SHADOW MOUNTAIN BIKE PARK
CONCEPT MASTER PLAN
WATER SYSTEM IMPROVEMENTS

Prepared For:

Colorado State Land Board
Shadow Mountain Bike Park
SE Group
Frisco, Colorado
PO Box 2729
323 West Main Street, Suite 202
Frisco, CO 80443-2729

Prepared By:

Stantec
5725 Mark Dabling Blvd. Suite 190
Colorado Springs CO 80919

November 2022
Revised October 2023
Project No. 181711248

*** * * * * * C O N T E N T S * * * * * ***

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******APPENDICES******

Appendix A	100-Year Flood Plain Certification
Appendix B	Water System Improvement

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Figure 1	Vicinity Map

Section 1
EXECUTIVE SUMMARY

This report presents the results of the engineering study for water system improvements serving Shadow Mountain Bike Park proposed on State Land Board Shadow Mountain parcels in Jefferson County, Colorado. Shadow Mountain Bike Park is proposed on undeveloped property with a designated address of 29611 Shadow Mountain Drive, Conifer, Colorado 80433.

The proposed parcel currently has no water facilities on site. Shadow Mountain Bike Park proposes construction of a minimum of one water well to provide potable water to the site facilities through a private water system.

Shadow Mountain Bike Park facilities will consist of a Base Lodge operating as a Class III Recreation facility to welcome guests and provide basic needs such as welcoming center including drinking water and restrooms.

The average annual water demand for Shadow Mountain Bike Park is estimated to be 1.57 acre-feet of water per year. Average day usage is estimated to be approximately 1400 gpd or 0.97 gpm. This water will be provided by water wells as permitted by the Colorado State Engineers Office.

To meet Drinking Water Standards water will be filtered (if required) and disinfected prior to storage and will meet Colorado Department of Health and Environment Drinking Water Standards.

Fire Protection is provided by the Elk Creek Fire Protection District. Discussions with District Representatives indicate that they will require on-site fire protection that can provide 1500 gpm for 2 hours. To meet this requirement onsite Fire Storage will need to be 180,000 gallons exclusive of storage required for domestic use. This storage will be provided in a separate Fire Storage only ground storage tank; fire flow will be conveyed to the site through a fire flow distribution system to on-site fire hydrants.

Section 2
INTRODUCTION

2.1 Purpose

The purpose of this report is to present water system improvements recommended to serve Shadow Mountain Bike Park; a proposed recreational development project located in Jefferson County. It is also intended to serve as a guideline for the ensuing design of recommended improvements.

2.2 Scope

The scope of this report includes:

1. The definition of the service areas as well as identification of significant physical and environmental characteristics and constraints.

2. An analysis of available data to determine existing and to project future water supplies, demands and quality.

3. A description of legal, institutional and managerial arrangements that ensure adequate control of the proposed improvements; and,

4. A preliminary recommendation for a selected supply, treatment, pumping and transmission alternatives.

Section 3
EXISTING CONDITIONS

3.1 Description of the Service Area

Shadow Mountain Bike Park consists of approximately 235 acres of Base Lodge (10 acres +/-) and open space uses and is located northwest of Conifer, Colorado, within Township 6 South, Range 71 West, Section 16.

3.2 Land Use

Shadow Mountain Bike Park is in Jefferson County northwest of Conifer, Colorado and about 35 miles southwest of the Denver Metroplex. Surrounding areas are primarily large tract residential properties and large undeveloped tracts.

3.3 Topography and Floodplains

The topography of the service area is typical of a Colorado Front Range Mountain parcel with elevations ranging from 8400 ft. to 9250 ft. above sea level. Existing slopes range from 5% at base camp to 25% or greater in some areas. Vegetation is typical Colorado mountain woodlands with a mix of Ponderosa Pine, Spruce, Fir and ground cover plants and grasses. The area drains generally northeast to North Turkey Creek.

There is no Federal Emergency Management Agency (FEMA 08059CO365F) established floodplain within the boundaries of Shadow Mountain Bike Park. See Appendix A.

3.4 Geology

The site is comprised of several different soil types. From the NRCS Soil Survey of Jefferson County, the site falls into the following soil types:

1.“67” Kittredge-Earcree, 9 to 20 percent slopes; Type A Soil
2.“76” Legault-Hiwan stony loamy sands, 15 to 30 percent slopes; Type D Soil
3.“77” Legault-Hiwan-Rock outcrop complex, 30 to 50 percent slopes; Type D Soil
4.“138” Rock outcrop, igneous and metamorphic; Type D Soil
5.“141” Rogert, very stony-Herbman-Rock outcrop complex, 30 to 70 percent slopes; Type D Soil
Note: “#” indicates Soil Conservation Survey soil classification number.

3.5 Groundwater

The proposed water supply for the Shadow Mountain Bike Park is an onsite water well. The applicant has been in discussion with the State Engineers Office concerning a well permit for the site including the type of permit and the uses permitted to ensure proper permitting. There are numerous wells in the area and discussions with the State indicate issuance of a permit could be made based on water rights associated with the property without injury to adjacent water rights.

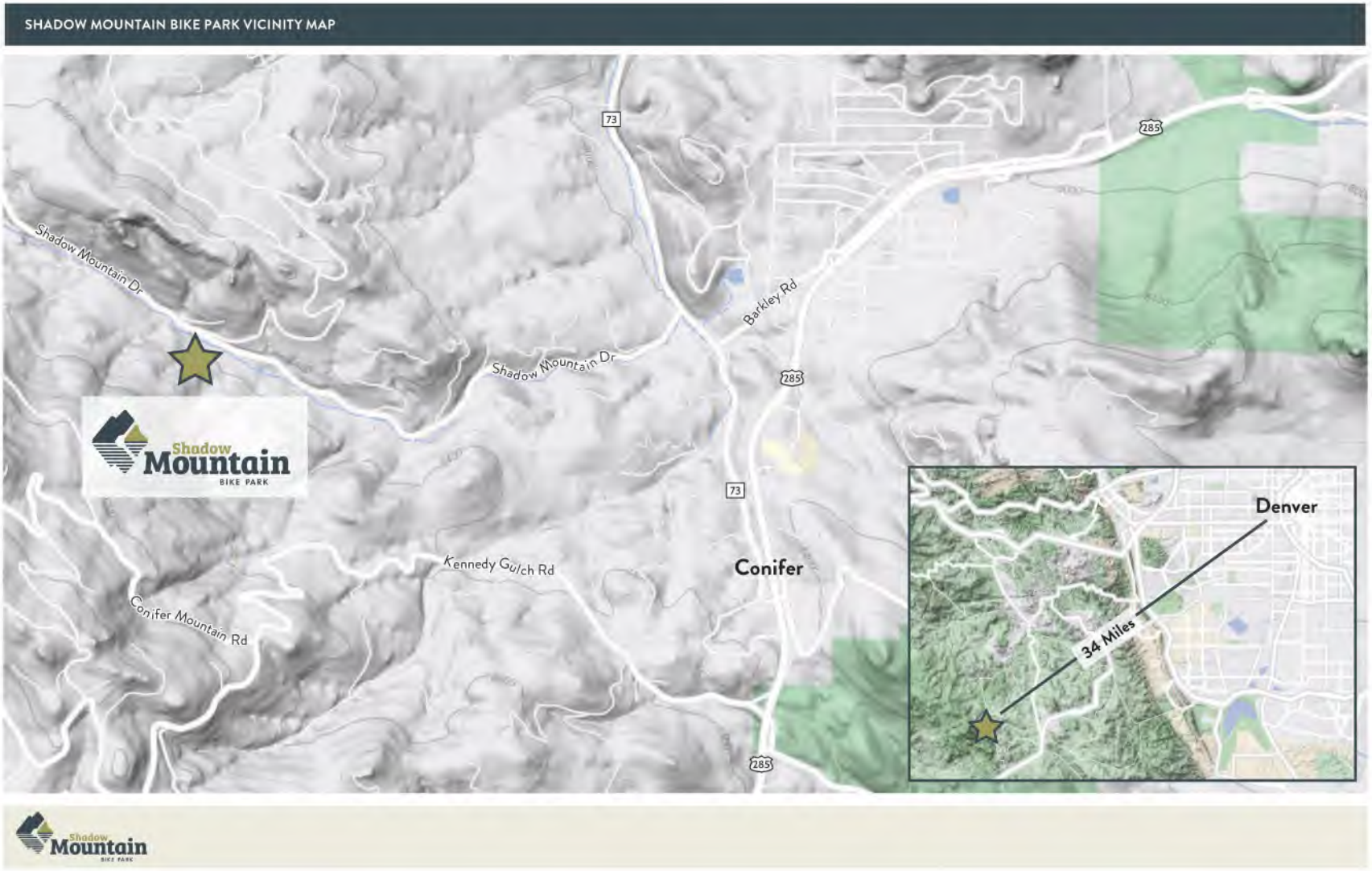


Figure 1: Vicinity Map

3.6 Climate

The climate of the study area is characterized by mild summers and moderately severe winters, moderate precipitation, high evaporation, and moderately high wind velocities.

The average annual monthly temperature is 43.5 F with an average monthly low of 10.3 F in the winter and an average monthly high of 76.1 F in the summer.

Precipitation averages 17.3 inches annually, with 50% of this falling as snow. August is the wettest month and January is the driest. The average annual Class A pan evaporation is 45 inches.

3.7 Natural Hazards Analysis

Natural hazards analysis indicates that no unusual surface or subsurface hazards are located in the service area. However, because the soils are cohesionless, sloughing of steep banks during drilling and/or excavation could occur. By siting improvements in a manner that provides an opportunity to lay the banks of excavations back at a 1:1 slope during construction, the problems associated with sloughing soils can be minimized.

3.8 Organizational Context

Shadow Mountain Bike Park is situated within the North Turkey Creek basin of Jefferson County. The closest public water supplier would be Mountain Water and Sanitation District in Conifer, Colorado. The distance and topography to Conifer in general is cost prohibitive in terms of a water supplier for the bike park.

The amount of water required for the facility and the distance to other providers makes an onsite private water system the best for meeting on-site demands. The Mountain Shadow Bike Park will be the entity responsible to finance, construct and ensure the continuing operation and maintenance of improvements.

3.9 Water Facilities

The proposed water system will consist of a minimum of one water well onsite and water treatment and disinfection based on source water conditions and Colorado Department of Health and Environment requirements. In addition, there will be a 6-inch water transmission line from the water well to the storage tank. Water will be stored to provide peak hour demand and fire sprinkler water for the onsite Base Lodge.

3.10 Relationship to Neighboring Water and Wastewater Facilities

Mountain Water and Sanitation District near Conifer, Colorado is the closest potential provider of water and wastewater facilities. The distance and topography between the site and the town make any connection cost prohibitive.

3.11 Water Demand

The Shadow Mountain Bike Park recreational development will be serviced by a private water system constructed by the developer of the bike park. The projected water demand for the facility is calculated in Section 4.3 Water Demand based on uses recorded at other Bike Park facilities.

Section 4
DEVELOPED CONDITIONS

4.1 Land Use

Mountain Shadow Bike Park consists of approximately 235 acres of State Land Board undeveloped property. Most of the site will be left undeveloped except for the addition of Bike Trails, a bike lift and development of approximately 10 acres for a base lodge including one building for welcoming, ticketing, water facilities and restrooms.

Assumptions: Employees water usage is estimated to be 10 gallons per day (gpd)
Guest Water Usage is estimated to be 4 gpd
Irrigation will be minimal or not required with xeriscape or extensions of the natural surroundings.

4.2 Population and Employment

The applicant estimates that there will be 20 onsite employees in a given day. The average day guest population is estimated to be 300.

4.3 Water Demand

Water demand is estimated to be as follows:

Employees	20 x 10 gpd =	200 gpd
Guests	300 x 4 gpd =	1200 gpd
	Total =	1400 gpd =511,000 gallons/year =1.57 ac-ft/year

Unit water demands are based on the applicants' experience at other similar facilities.

Water demand is calculated in acre-feet per year (AFY) to determine water supply needs. This value is then factored to determine the average daily demand (ADD) in gallons per minute (gpm), which is used to project maximum day and peak hour demands as well as to estimate revenues and operating costs. Maximum day demand (MDD) and peak hour demand (PHD) have been determined by applying accepted peaking factors of 2.5 and 4.0 to the ADD, respectively. The MDD is used to determine storage needs and the PHD is used for modeling system delivery pressures and to size distribution piping.

Demand	
Ac-Ft/Year =	1.57
Gallons/day=	1400
ADD gpm=	0.97
MDD gpm=	2.43
PHD gpm=	3.8

Estimated Building Sprinkler demand is 20 gpm for 2 hours or 2400 gallons.

4.4 Water Supply

The proposed water supply for the Shadow Mountain Bike Park is an onsite water well. The applicant has been in discussion with the State Engineers Office concerning a well permit for the site including the type of permit and the uses permitted to ensure proper permitting. There are numerous wells in the area and discussions with the State indicate issuance of a permit could be made based on water rights associated with the property without injury to adjacent water rights. Most of the wells in the area range between 350 ft to over 600 ft. in depth. The nearby wells all indicate access to an "unnamed" aquifer and are all located in a "non-designated" basin.

Based on information from adjacent properties we would anticipate construction and completion of a water well between 500 and 600 ft. in depth in an unnamed aquifer.

The water well permit should be for a well capable of producing at a minimum the anticipated Peak Hour Demand and overall, yearly withdraw limits should exceed 2 ac-ft (651,657 gallon) annually.

4.5 Water Quality

The water quality and any mitigation required will be determined after construction of the well based on the permit obtained from the State Engineers Office. Mitigation anticipated may include filtering and disinfection. Anticipated treatments expected would be easily obtained with standard readily available locally provided treatment and disinfection equipment.

4.5 Fire Flow

Fire Protection is provided by the Elk Creek Fire Protection District. Discussions with District Representatives indicate that they will require on-site fire protection that can provide 1500 gpm for 2 hours. To meet this requirement onsite Fire Storage will need to be 180,000 gallons exclusive of storage required for domestic use.

In most domestic water systems, the Fire Storage component is 20 to 30% of the overall storage requirement. In this case the Fire Storage component is 92%. Storing water for long periods of time can lead to water quality issues primarily related to taste. Because of this concern, the domestic storage and the fire storage will likely need to be separated.

Fire Storage can be addressed in one of two ways and evaluation of the best alternative will need to continue through the Design Phase to determine the most economical and efficient system.

<u>Ground Storage or Cistern with a Fire Pump</u>

This system would require a 180,000-ground storage tank approximately 30 feet in diameter and approximately 30 feet tall. Or alternatively a below grade 180,000 gallon cistern approximately 50 feet x 50 feet x 10 feet deep. Along with the storage there would be a requirement to install a 1500 gpm fire pump to deliver water at 20 psi. This type fire pump would require a 25 HP motor. Included with the design would be a backup generator and fuel storage to provide electricity to the pump if the power failed during a fire.

<u>Ground storage/elevated Fire Storage.</u>

This system would require a 180,000-gallon storage tank approximately 30 feet in diameter and 30 feet tall located at an elevation approximately 50 feet higher than the facility. No fire pump or backup generator

would be required, but approximately 2100 feet of transmission pipe would be required to convey water from the site to the tank.

In both cases some pipe would need to be located around the site to distribute to fire hydrant locations (2 maximum).

It would take a 10 gpm well approximately 12.5 days to fill the fire storage tank.

Some type of disinfection and/or aeriation may be required in either system to prevent growth of bacteria that could interfere with the distribution of fire flow.

Evaluation of the two potential fire storage options will continue with final design. However, in order to avoid the expense of a large fire pump and backup generator and to use the advantage of gravity flow this report will assume the use of the second option; a ground storage elevated tank.

Section 5
WATER SYSTEM IMPROVEMENTS

5.1 General

The water system would be operated by the Shadow Mountain Bike Park and would be classified as a private water system and would be operated to meet the applicable requirements of the Colorado Department of Health and Environment (CDHE). The system may be operated by a third party contracted by Shadow Mountain Bike Park and licensed by the State of Colorado.

Filtration and disinfection facilities provide treatment of the raw water sources to ensure good water quality. In addition, storage facilities and distribution piping will be provided to ensure that residual pressure requirements are achieved both during peak hour demands and during maximum day demands. The system will also by designed to deliver the required fire sprinkler water to the onsite building.

5.2 Groundwater Wells

The proposed water supply for the Shadow Mountain Bike Park is an onsite water well. As mentioned previously, the applicant has been in contact with the State Engineers Office concerning the parameters of a permit.

The water well permit should be for a well capable of producing at a minimum the anticipated Peak Hour Demand and overall, yearly withdraw limit should exceed 2 ac-ft annually.

The well will be equipped with a submersible well pump capable of delivering in excess of the Peak Hour Demand of 3.8 gpm. The well pump would be designed to deliver water to the domestic storage tank and fire tank.

5.3 Water Treatment

Treating and filtering of the water sources will meet CDHE Drinking Water Standards.

In addition, CDHE standards require that the water supply be disinfected and that the supply receives minimum chlorine contact time of 30 minutes before first use.

5.4 Storage

Storage reservoirs will be ground mounted and elevated steel tanks designed in accordance with CDHE and AWWA Standards.

Potable Water Storage is sized to provide a minimum of 30% of maximum day demand. Required storage is calculated as follows:

Maximum Day Demand is 3.8 gpm. 3.8 x 60 x 24 = 5,472 gallons

Estimated Storage Requirement = 5,472 gallons say 7,500 gallons

Tank size could be doubled to allow for special events. Normal operation would be between 5000 and 7500 gallons. Actual storage requirements and operational characteristics will be addressed as final design proceeds.

Fire Demand Storage will be 180,000 gallons as stated in section **4.5 Fire Flow**. Water stored for fire flow will not be considered potable due to disinfection required to maintain functional fire flow storage for long periods of time without use.

5.5 Distribution

The water distribution system provides water at a maximum static pressure of 45 psi during periods of low use and at a minimum residual pressure of 40 psi during peak hour demand. The storage tank will be located at an elevation sufficient to meet these pressure requirements along with associated distribution and conveyance piping. Anticipated transmission and distribution piping is 6-inch.

Fire flow will be conveyed in its own distribution system to 2 fire hydrants located with the fire district input around the site near the building during final design. Each fire hydrant will be capable of conveying 1500 gpm at a minimum pressure of 20 psi. The anticipated fire system piping will be 6-inch minimum diameter.

5.6 Estimated Costs

Estimated Costs

Item	Units	Quantity	Unit Price	Extension
Shadow Mountain Bike Park				
Water Well	LS	1	$50,000	$50,000
Well Pump and Controls	LS	1	$15,000	$15,000
Potable Water Transmission	LF	5,800	$35	$203,000
Potable Storage	Gallons	15,000	$3	$45,000
Fire Storage Transmission	LF	2,500	$35	$87,500
Fire Storage	Gallons	180,000	$2	$360,000
Treatment	LS	1	$40,000	$40,000
Total Estimated Cost				*$800,500*

The above system improvements are all constructed as part of Shadow Mountain Bike Park. These costs do not include other costs or gains that may be incurred in the acquisition of land, financing, investment, local distribution, the salvage value of equipment or other necessary infrastructure, among others, unless specifically noted. The above costs are estimated, actual costs may differ depending upon numerous factors including supply chain, and cost increases at time of bidding.

5.7 Rates and Charges

The waters system will be operated within the overall operation of the Shadow Mountain Bike Park through user fees charged to guests for the recreational facility.

Appendix A

100 Year Flood Plain Certification

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables shown on this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Floodway Data table shown on this FIRM.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1998 or later.

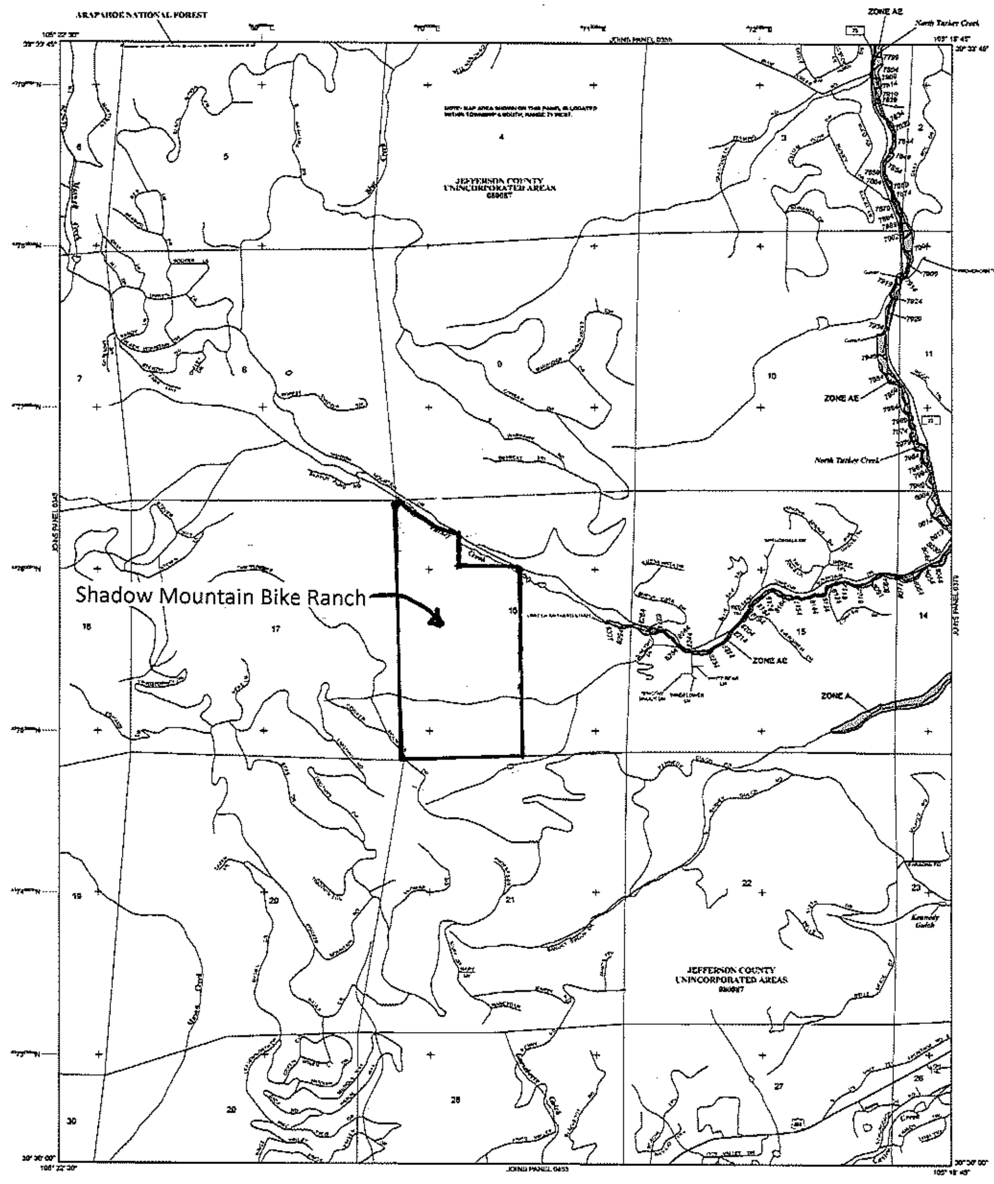
This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels, community map repository addresses, and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM, visit the FEMA Map Service Center (MSC) website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have questions about this map, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange (FMIX) at 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

ZONE A
ZONE AE
ZONE AH
ZONE AO
ZONE AR
ZONE A99
ZONE V
ZONE VE

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X

OTHER AREAS

ZONE X
ZONE D

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

MAP SCALE 1" = 1000'

NFIP — NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0385F

FIRM
FLOOD INSURANCE RATE MAP

JEFFERSON COUNTY, COLORADO
AND INCORPORATED AREAS

PANEL 385 OF 875
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
08059C0385F

MAP REVISED
FEBRUARY 5, 2014

Federal Emergency Management Agency

Appendix B

Water System Improvements

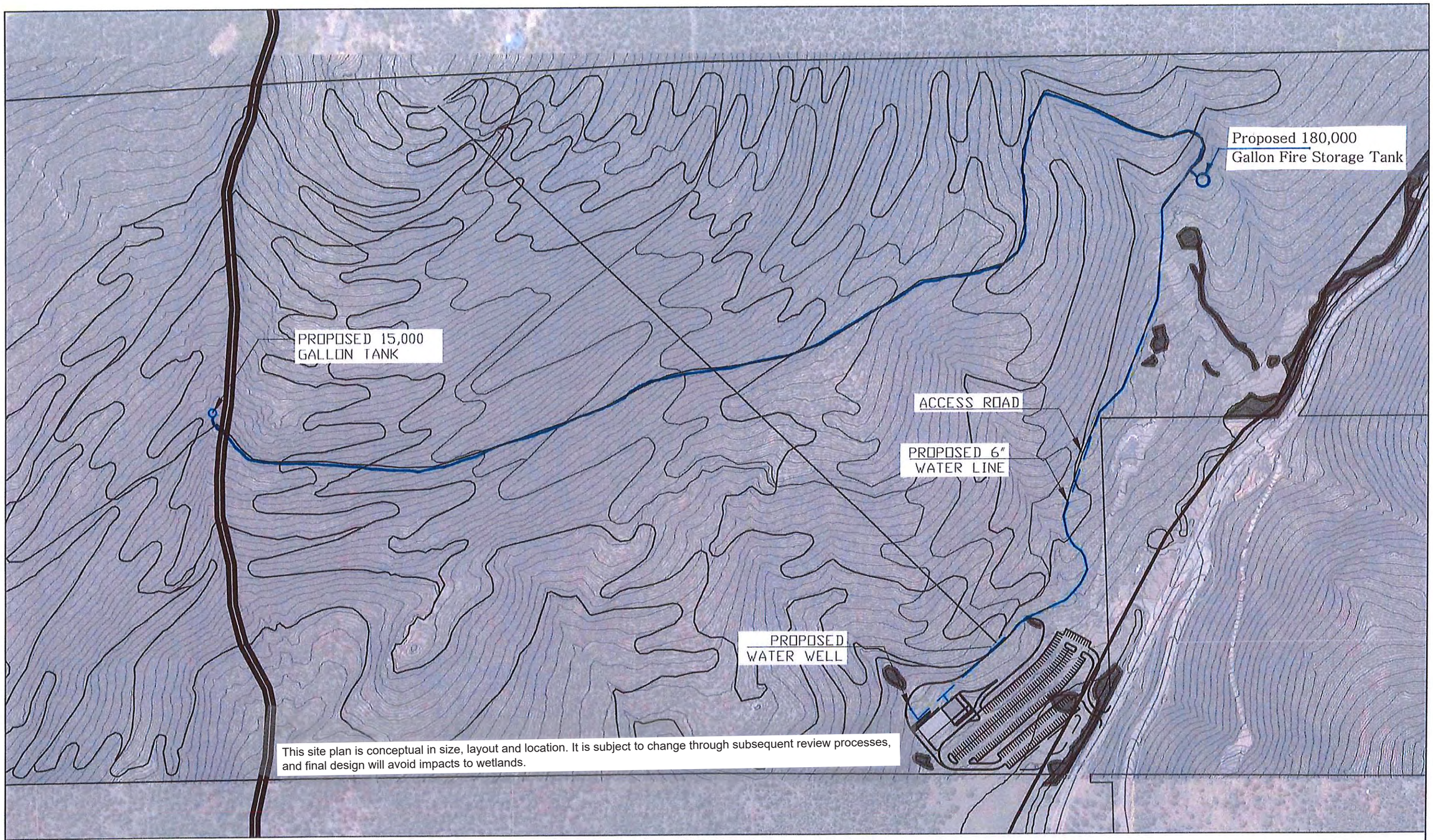
Stantec
2000 S COLORADO BLVD
SUITE 300
DENVER, CO 80222

WATER SYSTEM SITE DRAWING (A)

SHADOW MOUNTAIN BIKE PARK

SCALE: 1"=60'

N



Stantec

2000 S COLORADO BLVD
SUITE 300
DENVER, CO 80222

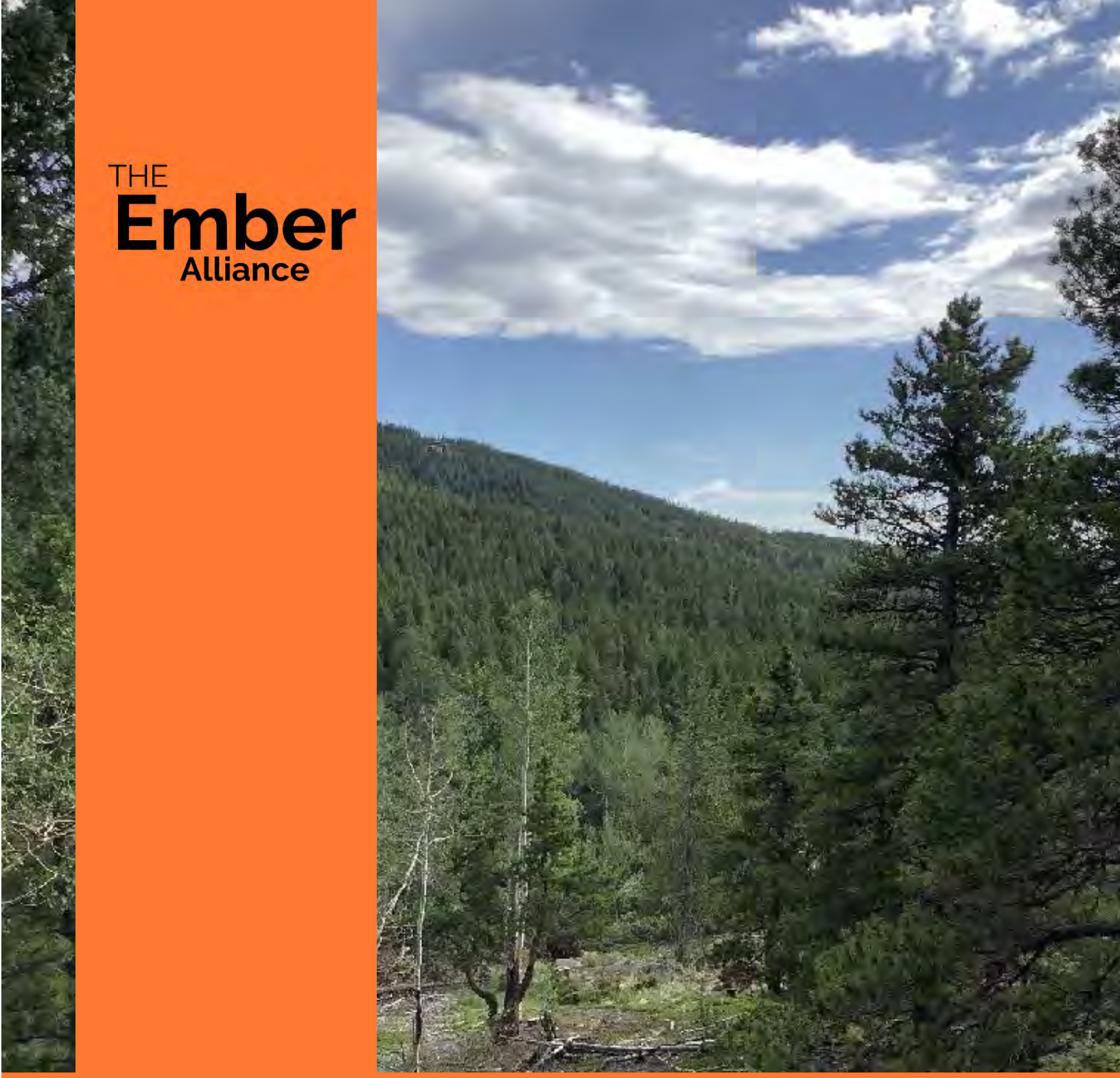
WATER SYSTEM SITE DRAWING (B)

SHADOW MOUNTAIN BIKE PARK

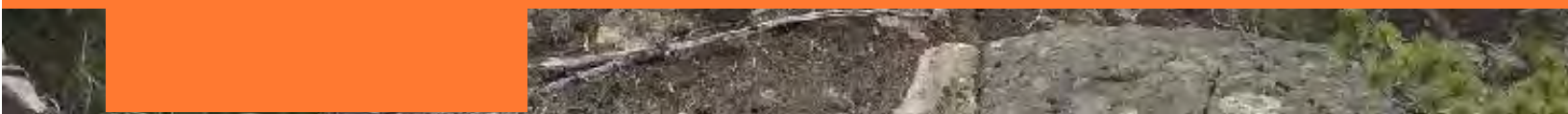
SCALE: 1"=300'

N

THE Ember Alliance



Shadow Mountain Bike Park Wildfire Mitigation Hazard Plan



Prepared for:

Shadow Mountain Bike Park
FSBR LLC

- and -

SE Group
PO Box 2729
Frisco, CO 80443

Prepared by:

The Ember Alliance
PO Box 2084
Fort Collins, CO 80522

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1. Introduction

1.a. Site Visit

Staff at The Ember Alliance completed a site visit on September 20 and 21, 2023. A seasonal forestry crew walked the property assessing and delineating planned areas for mitigation and management. The visit also evaluated Shadow Mountain Drive between Highway 73 and the property, following the assessment guidelines in the Colorado State Forest Service (CSFS) Fuelbreak Guidelines document.

1.b. Management Area Maps and Desired Future Conditions

Eight management areas were delineated, along with descriptions of desired future conditions (DFCs) for each management area. These management areas and DFCs cover all the essential areas to treat to achieve SMBP's goals for general wildfire mitigation and user safety.

To define the DFCs, management objectives were first identified. This site is intended to be a recreational area within Jefferson County, so to be consistent with other recreational areas in Jefferson County, the management objectives for this site were defined as the same ones that

Jefferson County Open Space uses in the 2022 Forest Health Plan. Ten objectives were identified, as follows:

1. Reduce risk of catastrophic wildfire
2. Reduce forest densities and canopy cover
3. Increase the presence, size, and diversity of forest openings
4. Restore and maintain a mosaic of ecosystems and vegetation cover across the landscape
5. Promote fine scale heterogeneity in tree spatial patterns
6. Protect and enhance old-growth features
7. Where appropriate, reestablish the use of prescribed fire as a management tool
8. Promote long-term ecosystem resilience to natural disturbance
9. Assist with ecosystem adaptation to climate change
10. Create aesthetically pleasing forest stands

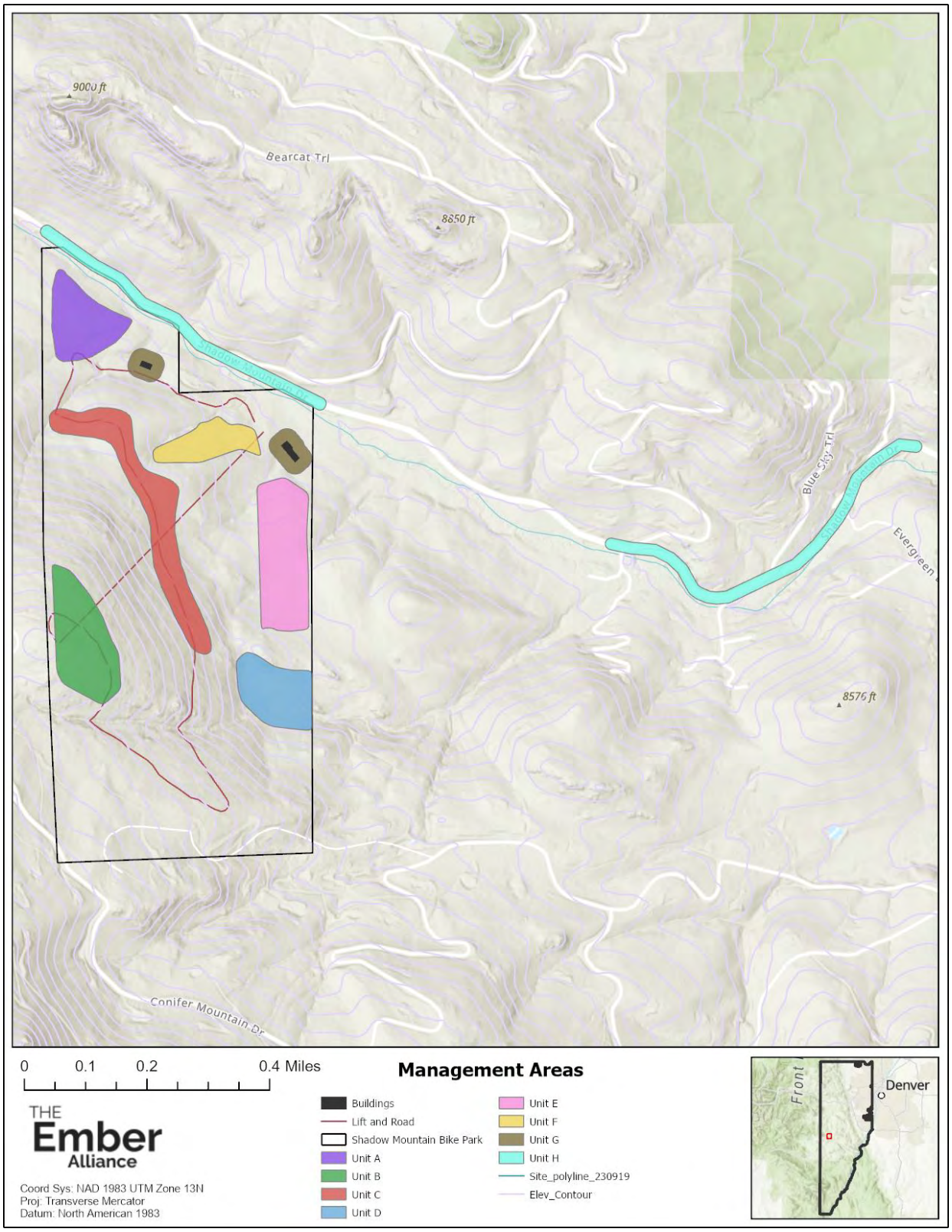

Figure 1. All Management Areas.

Figure 2. Management Area A.

Management Area A

Approximately 7.5 acres of mixed conifer and ponderosa pine forest.

Desired Future Conditions

Uneven-aged mixed conifer stands with occasional established ponderosa pine. Minimal ladder fuels are present, trees grouped with spacing between groups. Ponderosas have a wide spacing around their canopy. Occasional standing dead trees are retained as habitat trees.

Management Objectives Achieved: 1, 2, 3, 5, 6, 9, 10

Treatment

In Area A, all trees (excluding aspen) with a diameter at breast height (DBH) of 6 inches or under should be removed. All juniper and gamble oak should be removed. Occasional standing dead trees can be retained where they pose no risk to bikers.

Approximately 15-20% of trees with a DBH greater than 6 inches should be removed with an intent to isolate canopy groups. Retain all trees with a DBH greater than 20 inches, and favor removing smaller trees when possible. Favor retaining ponderosa pine to support climate adaptation within this ecosystem.

Limb (prune) all the remaining trees up to 10 feet from the ground. Work east as much as possible to preserve structures while maintaining a transition zone around the nearby private property/homes. Thin conifers as close as possible to the road and retain any aspen and willows near the river to support erosion control and stream health.

This area is best suited for selective hand thinning and chipping for slash management.

Treatment Return Interval

Evaluate the need for small diameter tree thinning and ladder fuel removal every 5 years. Treatment re-entry needed to maintain forest health and historic conditions is estimated to be 8 to 23 years following the treatment. Regeneration can be dense and contribute to increased fire risk and intensity and should be actively managed and mitigated.

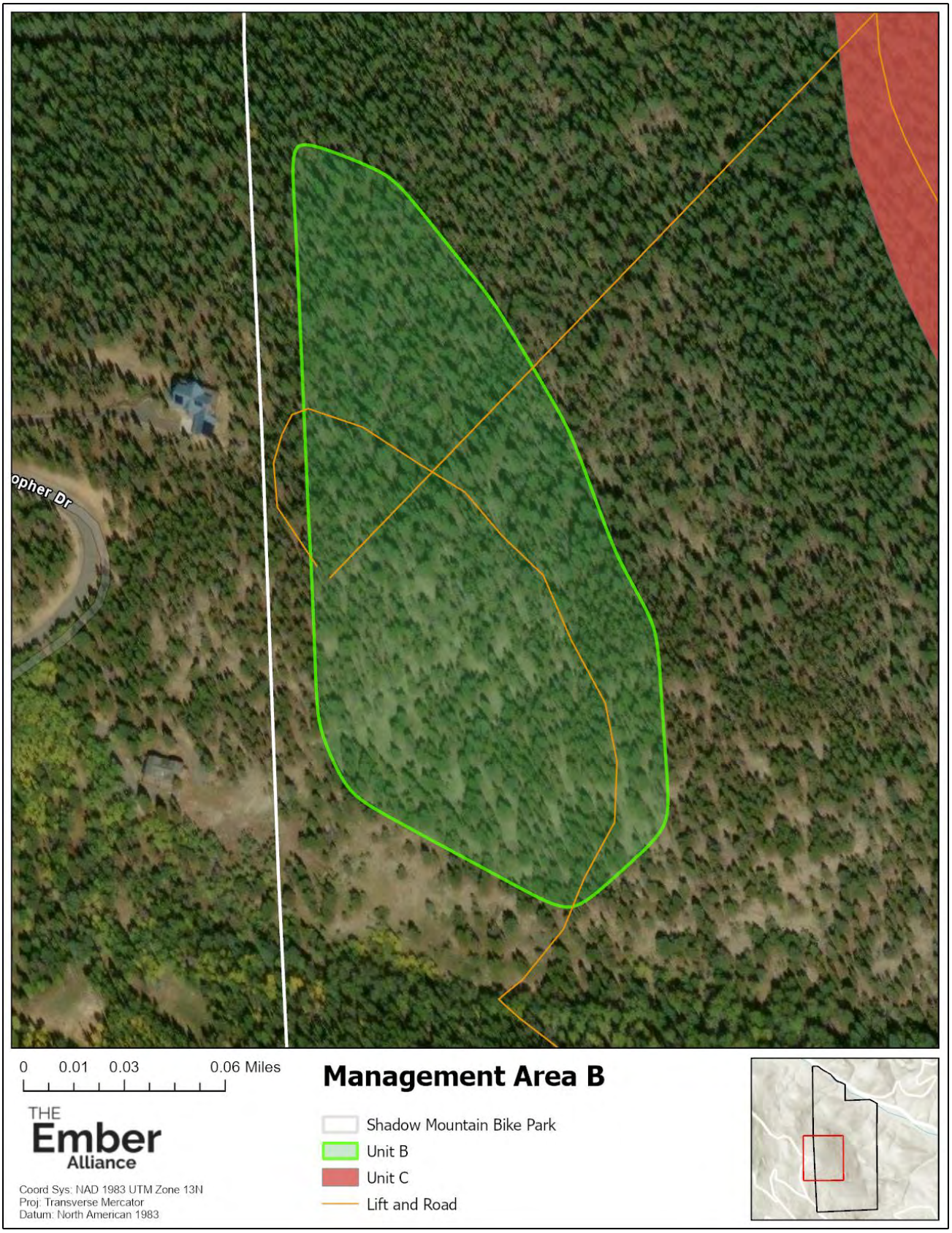

Figure 3. Management Area B.

Management Area B

Approximately 10.5 acres of mixed conifer and spruce-fir forest.

Desired Future Conditions

An uneven-aged mixed conifer/spruce-fir forest with groupings of trees. Conifer forests are maintained and moderately thinned to remove the most hazardous fuels but promote health and vigor of the remaining trees. Minimal ladder fuels are present, and there is enough open space to provide a view/outlook of the surrounding landscape. Trees in this area are in a stand that surrounds the "outlook" area. Trees are retained and managed to provide a visual buffer between the residences and the chairlift. Occasional standing dead trees are retained as habitat trees.

Management Objectives Achieved: 1, 2, 3, 5, 6, 7, 8, 10

Treatment

In Area B, all trees with a diameter at breast height (DBH) of 6 inches or under should be removed. All juniper and gamble oak should be removed. Occasional standing dead trees are retained where they pose no risk to bikers.

All trees with a DBH greater than 6 inches should be removed with the intent to isolate canopy groups. Retain all trees with a DBH greater than 20 inches, and favor removing smaller trees when possible.

Limb all the remaining trees up to 10 feet from the ground. Remove shrubs and ladder fuels under the trees. Maintain a transition zone to the private property.

This area is best suited for mechanical thinning and pile building for slash management.

Treatment Return Interval

Evaluate the need for small tree thinning and ladder fuel removal every 5 years. Treatment re-entry needed to maintain forest health and historic conditions is estimated to be 8 to 23 years following the treatment. Tree regeneration can be dense and contribute to increased fire risk and intensity and should be actively managed and mitigated.

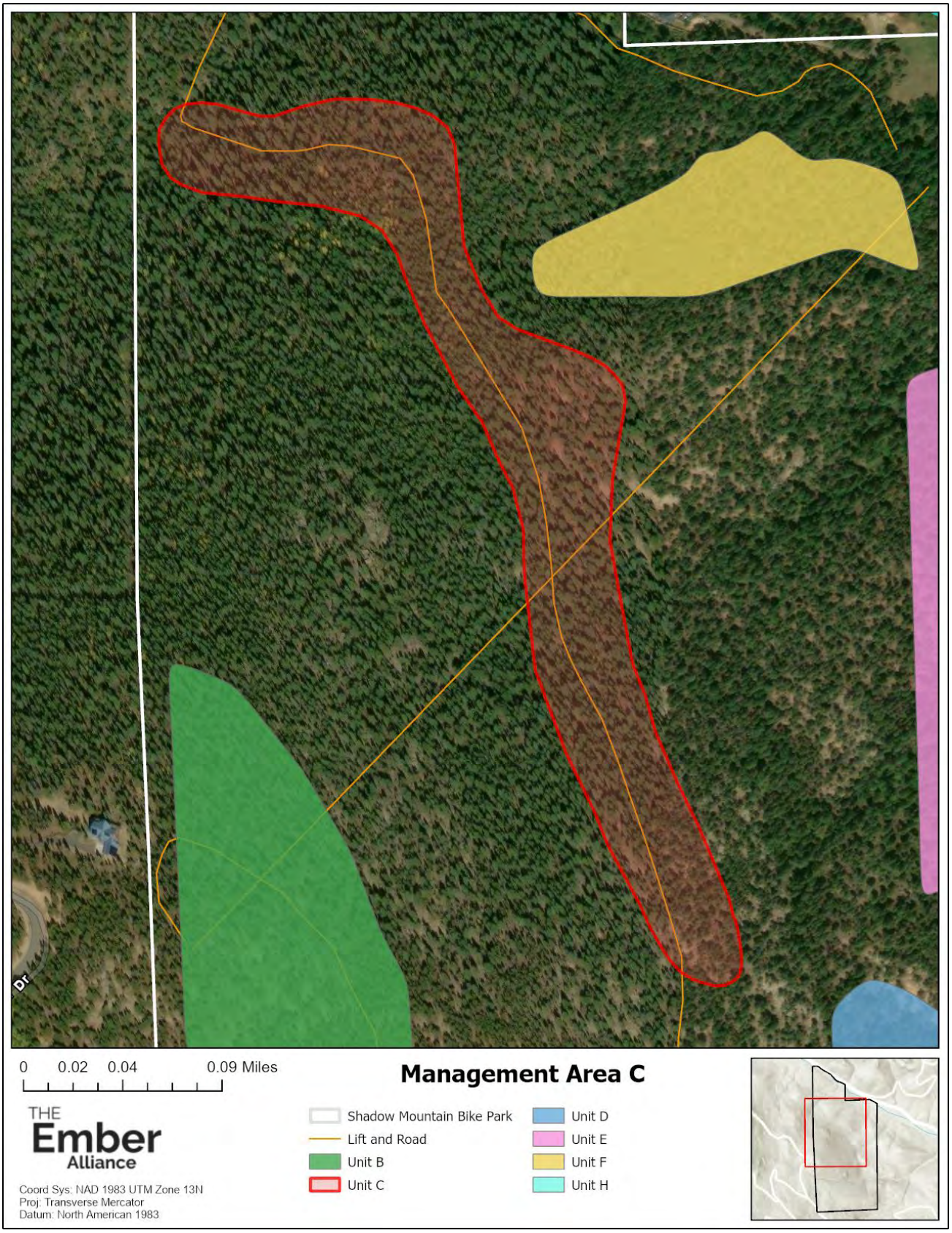

Figure 4. Management Area C.

Management Area C

Approximately 14 acres of mixed conifer, spruce-fir, and ponderosa pine forest.

Desired Future Conditions

A fuel break along the maintenance road/base of the steep slope of the mixed conifer forest. Minimal ladder fuels are present, with wide spacing between tree crowns/groupings of tree crowns. Standing dead trees are not retained.

Management Objectives Achieved: 1, 2, 3, 5, 6, 8, 10

Treatment

In Area C, all trees (excluding aspen) with a diameter at breast height (DBH) of 6 inches or under should be removed. All juniper and gamble oak should be removed.

Approximately 15-20% of trees with a DBH greater than 6 inches should be removed with an intent to isolate canopy groups. Retain all trees with a DBH greater than 20 inches, and favor removing smaller trees when possible.

Limb all the remaining trees up to 10 feet from the ground. Remove ladder fuels/shrube under the trees.

This area is best suited for selective hand thinning and chipping for slash management.

Treatment Return Interval

Evaluate the need for small tree thinning and ladder fuel removal every 5 years. Treatment re-entry needed to maintain forest health and historic conditions is estimated to be 8 to 23 years following the treatment. Tree regeneration can be dense and contribute to increased fire risk and intensity and should be actively managed and mitigated.

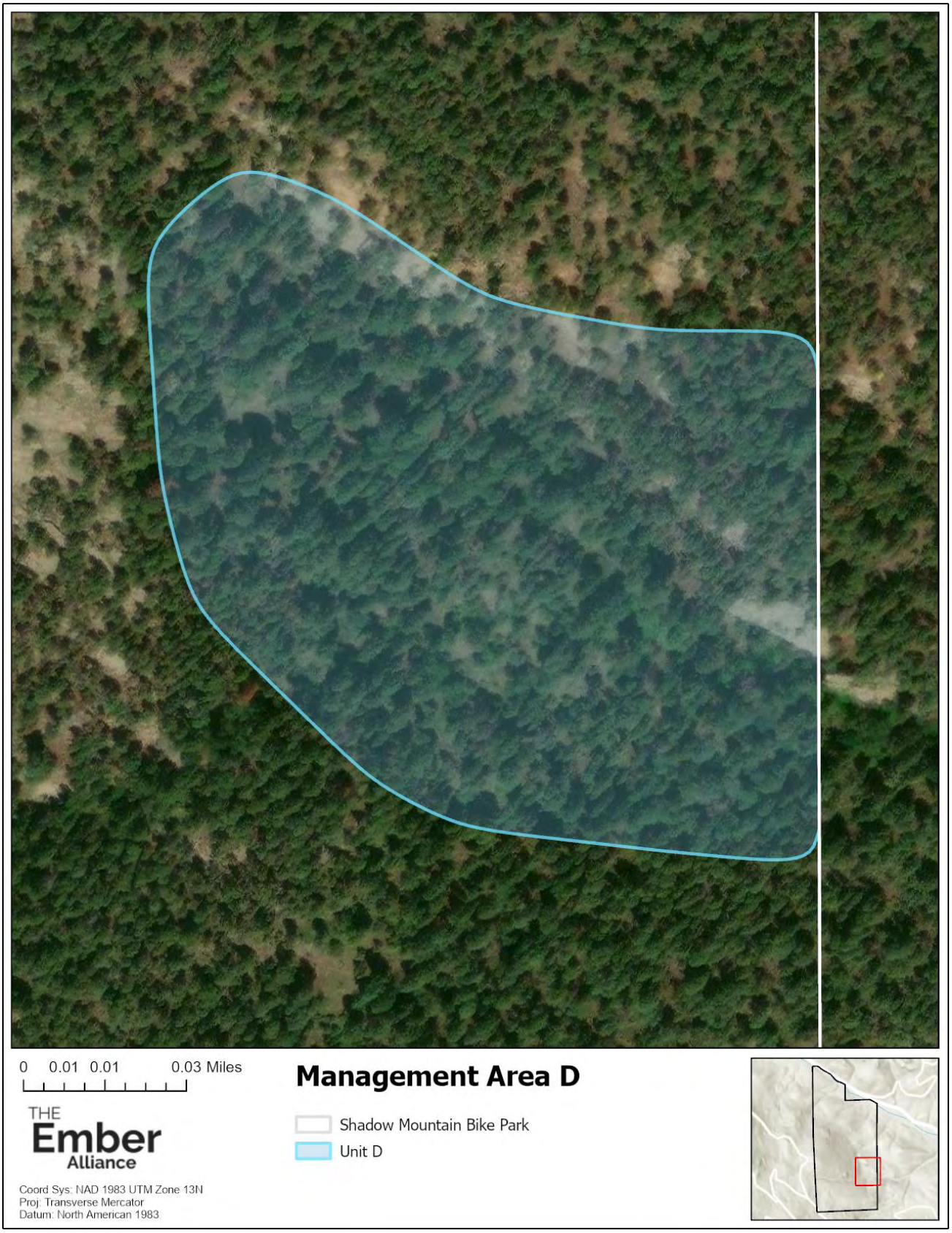

Figure 5. Management Area D.

Management Area D

Approximately 7.5 acres of lodgepole pine forest with some fir.

Desired Future Conditions

Mosaic stands of lodgepole pine. Each stand is even-aged but there is age diversity between the stands. Patch cuts mimic historic fire in this forest type, which would replace entire stands with each fire event. To protect the aesthetic and habitat value of the lodgepole pine area, smaller patch cuts are completed, rather than larger cuts.

Management Objectives Achieved: 1, 2, 3, 4, 5, 6, 8, 9, 10

Treatment

In Area D, patch cut in 3-acre sections, focusing along the west flank until the lodgepole stand gets too steep to cut. Patch cuts remove all sizes and species of trees except aspen, which are retained. Occasional standing dead trees may be retained, if present. The steepness of the site may limit the work that a crew can complete.

This area is best suited for hand crew cutting and pile building/burning for slash management.

Treatment Return Interval

After the initial 3-acre patch cut is completed, that stand is permitted to regenerate without thinning for at least 75 years (the lower end of their historic fire return interval). A second or third entry for patch cuts in other sections of this management area can be completed in the decades following the initial cut. Age diversity between the patch cuts is important as it creates habitat diversity and a mosaic landscape that is more resilient to wildfire. Stands should not frequently reach an average age beyond 300 years, which is the upper end of their fire return interval.

If the land managers have the resources, additional 3- to 6-acre patch cuts can be completed with the same objectives and DFCs in the southwest corner of the property. The north-facing hillside on the very south side of the property can be treated for additional fuels mitigation and habitat diversity.

Figure 6. Management Area E.

Management Area E

Approximately 12 acres of mixed conifer forest with aspen.

Desired Future Conditions

An uneven-aged mixed conifer forest with increasingly large aspen stands. Conifer forests are maintained and moderately thinned to remove the most hazardous fuels but promote health and vigor of the remaining trees. Aspen is favored and allowed to grow freely, becoming old growth in time. Small forest openings are present between aspen and conifer, and between groupings of conifers. Minimal ladder fuels are present in the coniferous areas and occasional standing dead trees are retained as habitat trees.

Management Objectives Achieved: 1, 2, 3, 4, 5, 6, 8, 9, 10

Treatment

In Area E, all trees (excluding aspen) with a diameter at breast height (DBH) of 6 inches or under should be removed. All juniper and gamble oak should be removed. Occasional standing dead trees are retained where they pose no risk to bikers.

Approximately 15-20% of trees with a DBH greater than 6 inches should be removed with an intent to isolate canopy groups, cutting smaller trees when possible.

Limb all the remaining trees up to 10 feet from the ground. Remove shrubs and ladder fuels under trees.

This area is best suited for selective hand thinning and pile building/burning for slash management.

Treatment Return Interval

Evaluate the need for small tree thinning and ladder fuel removal every 5 years. Treatment re-entry needed to maintain forest health and historic conditions is estimated to be 8 to 23 years following the treatment. Tree regeneration can be dense and contribute to increased fire risk and intensity and should be actively managed and mitigated.

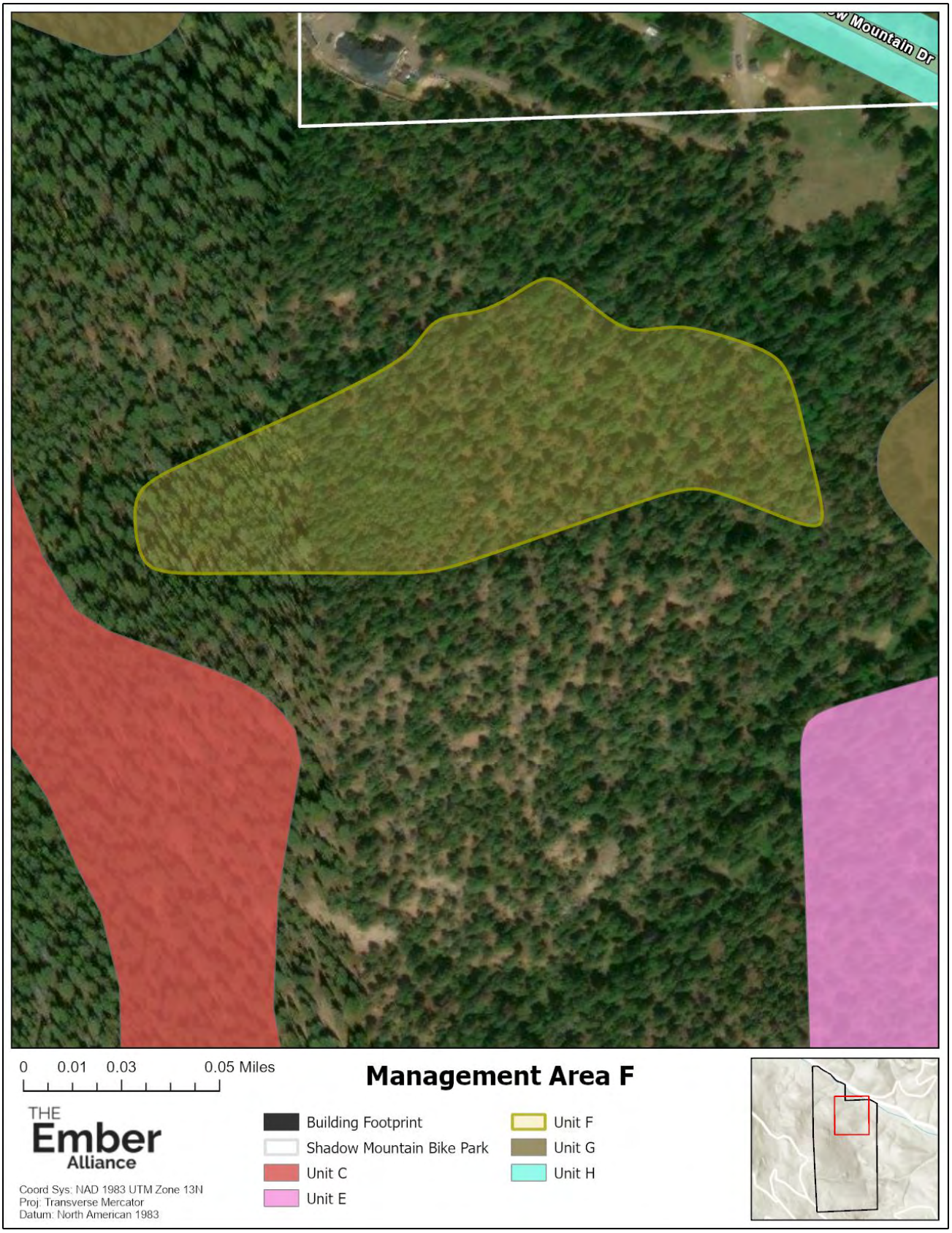

Figure 7. Management Area F.

Management Area F

Approximately 5 acres of mixed conifer forest with aspen.

Desired Future Conditions

An uneven-aged mixed conifer forest with increasingly large aspen stands. Conifer forests are maintained and thinned to remove the most hazardous fuels but promote health and vigor of the remaining trees. Aspen is favored and allowed to grow freely, becoming old growth in time. Small forest openings are present between aspen and conifer, and between groupings of conifers. Minimal ladder fuels are present in the coniferous areas and occasional standing dead trees are retained as habitat trees.

Management Objectives Achieved: 1, 2, 3, 4, 5, 6, 8, 9, 10

Treatment

In Area F, all trees (excluding aspen) with a diameter at breast height (DBH) of 6 inches or under should be removed. All juniper and gamble oak should be removed.

Approximately 15-20% of trees with a DBH greater than 6 inches should be removed with an intent to isolate canopy groups. Retain all trees with a DBH greater than 20 inches, and favor removing smaller trees when possible.

Limb all the remaining trees up to 10 feet from the ground. This area is very dense with lots of saplings. Maintain a transition zone around the nearby private property/homes.

This area is best suited for selective hand thinning and chipping and/or pile building for slash management.

Treatment Return Interval

Evaluate the need for small tree thinning and ladder fuel removal every 5 years. Treatment re-entry needed to maintain forest health and historic conditions is estimated to be 8 to 23 years following the treatment. Tree regeneration can be dense and contribute to increased fire risk and intensity and should be actively managed and mitigated.

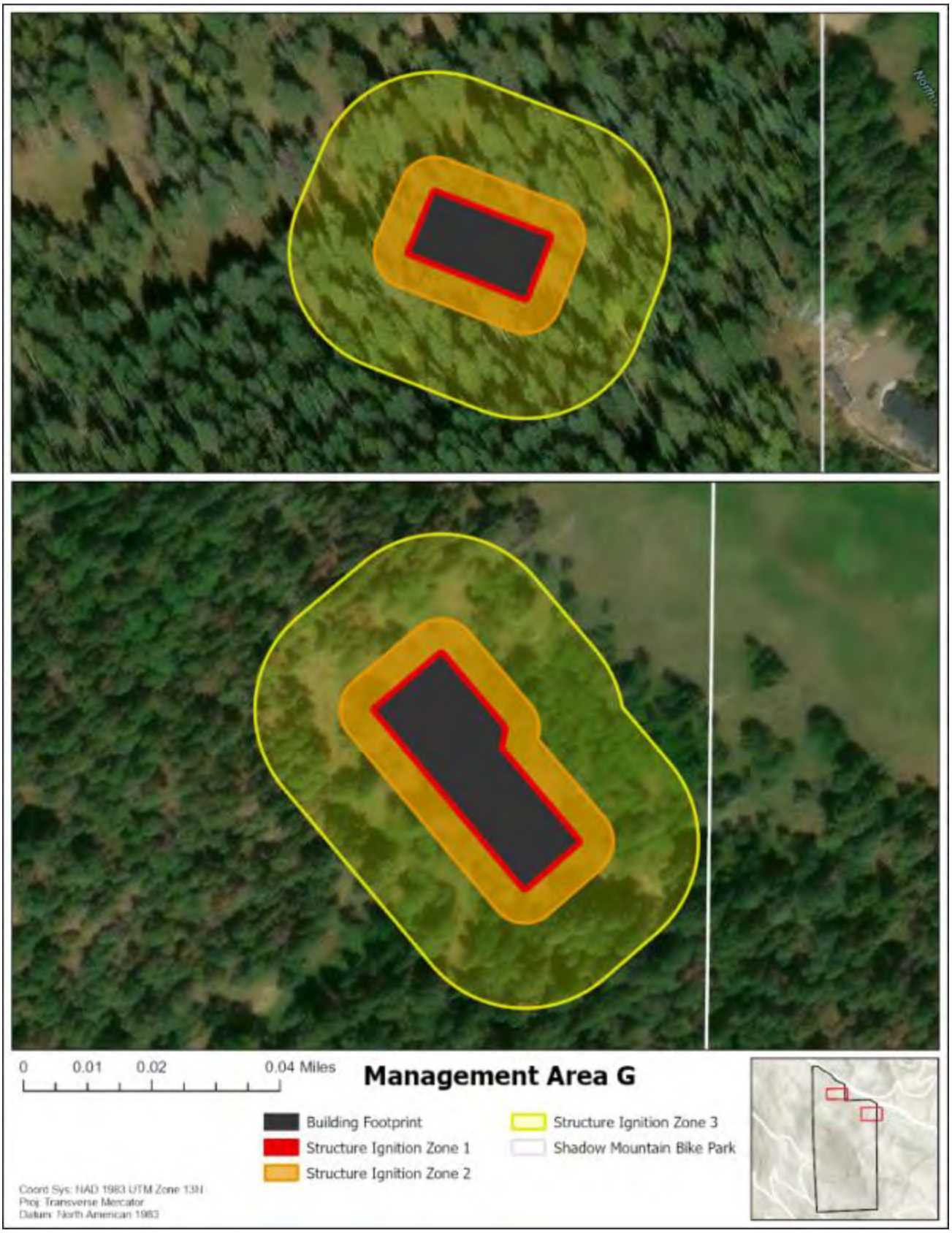

Figure 8. Management Area G.

Management Area G

Approximately 3.5 acres of mixed conifer forest with aspen.

Desired Future Conditions

Structures have home hardening measures taken to be ignition resistant. No vegetation within 5 feet of the structures. Minimal, potentially irrigated vegetation within 30 feet of the structures. Minimal vegetation with wide spacing and no ladder fuels within 100 feet of the structure.

Management Objectives Achieved: 1, 2, 3, 4, 5, 10

Treatment

Zone 1: From 0-5 feet from the edge of the buildings, install concrete, gravel, or another non-flammable groundcover.

Zone 2: From 5-30 feet, there should be no more than 20 trees total left within this zone around the maintenance facility and no more than 30 around the lodge (assuming an average tree crown spread of 30 feet). We recommend aiming for approximately half that number to err on the side of caution, leaving no more than 10 and 15 trees, respectively. If there are aspens, those should be selected to remain over any other species. All trees should have a minimum of 10 feet of spacing between the crowns. If trees are planted following the building construction, include the anticipated crown diameter in this plan. Remove any dead, dying, or diseased trees.

Mow all grasses regularly to keep the height no more than 4 inches. Irrigation is recommended but not necessary, due to water constraints and the desire for a natural aesthetic.

All remaining trees should be limbed (pruned) to a height of 10 feet. This means the distance from the ground to the bottom of the lowest part of the lowest hanging branch.

All juniper and gamble oak should be removed. Any other remaining shrubs, such as mountain mahogany or chokecherry, can remain if they are not under trees or tree canopies. Shrubs should be isolated and not be allowed to grow in groups or continuous clusters.

Zone 3: From 30-100 feet from the end of the structures, there should be no more than 36 trees total left within this zone around the maintenance facility and no more than 48 around the lodge (assuming an average tree crown spread of 30 feet). We recommend aiming for approximately half that number to err on the side of caution, leaving no more than 18 and 24 trees, respectively. If there are aspens, those should be selected to remain over any other species. All trees should have a minimum of 10 feet of spacing between the crowns. Remove any dead, dying, or diseased trees.

The remaining trees should be limbed to a height of 10 feet. This means the distance from the ground to the bottom of the lowest part of the lowest hanging branch. Remove any shrubs that are under tree canopies.

This area is suitable for mechanical or hand thinning. Any and all slash, woody debris, or other flammable material should be removed entirely from these zones. They can be hauled off site or masticated and spread outside the zones.

Treatment Return Interval

Annual maintenance of each of these areas is required.

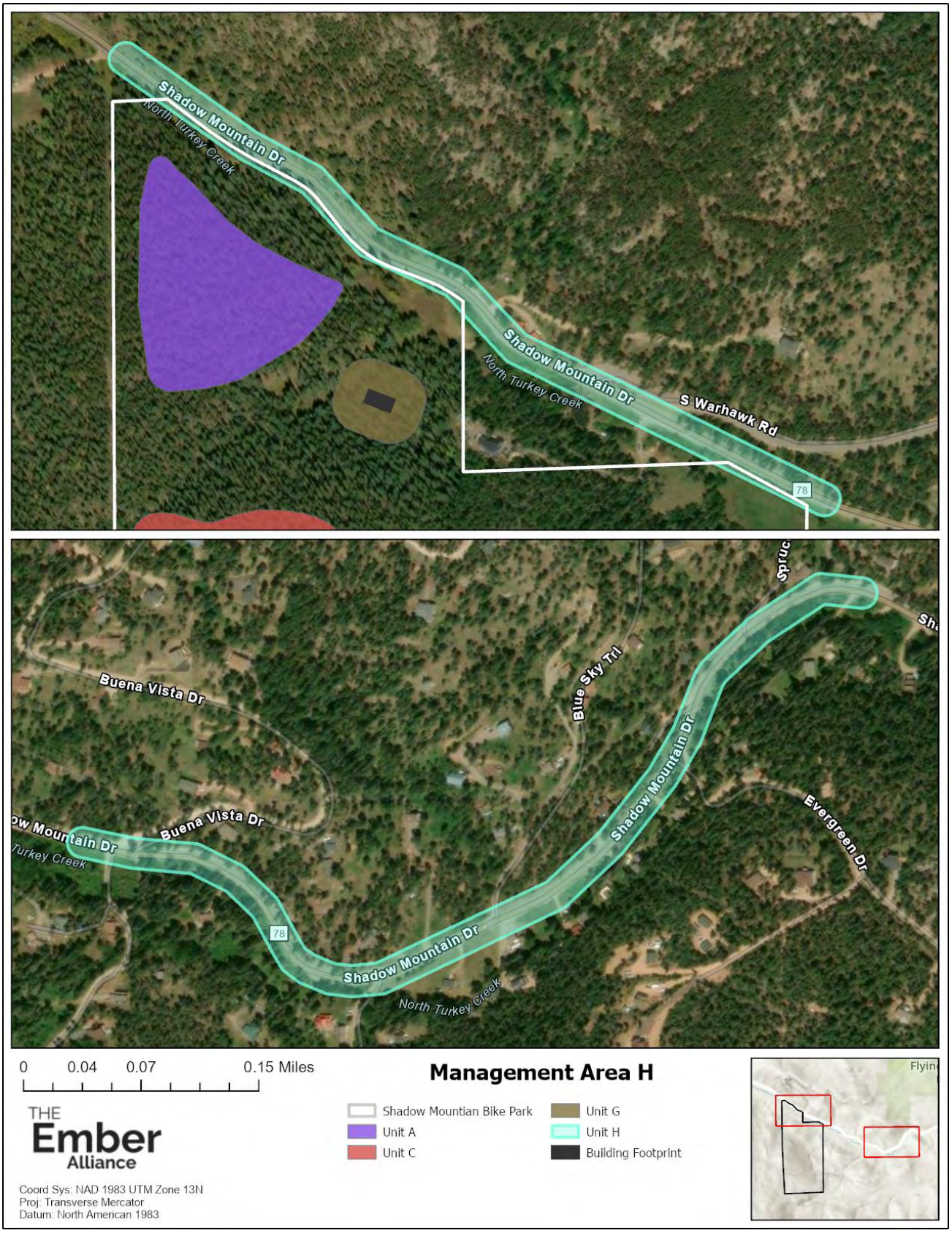

Figure 9. Management Area H.

Management Area H

Approximately 1.25 miles of road. The crowning potential in this area ranges from 3-9, designating it as an area in need of treatment and mitigation.

Desired Future Conditions

The road has space to either side of the lanes that is open enough to keep the flame length down to 8 feet or less. Evacuating residents and incoming firefighters have adequate space to drive and turn around engines without endangering their passengers.

Crowning potential, when assessed to the same CSFS Fuelbreak Guideline standards, should be a 3 or below following the treatment.

Management Objectives Achieved: 1, 2, 3, 4, 5, 6, 8,

Treatment

In Area H, remove all trees (excluding aspen) within 15 feet of the side of the road, where possible. Beyond that, thin trees according to the CSFS Fuelbreak Guidelines document along the identified portions of Shadow Mountain Drive. This involves creating 10 feet of space between crowns and removing ladder fuels under and between the trees. Favor retaining larger and older trees, as well as retaining aspen or other riparian species, where they are present. The slope from the roadways is generally between 20-40%, indicating that an ideal fuelbreak distance from the edge of the road would be 110-130 feet. This distance likely crosses into private land and is therefore not accessible. The treatment recommendation is that the fuelbreak is mitigated as far from the road as is feasible using the county-owned land and right-of-way easements.

This area is best suited for selective hand thinning and/or use of a roadside masticator head and chipping for slash management.

Treatment Return Interval

Tree regeneration in opened stands such as initial fuelbreak cuts can be dense and contribute to increased fire risk and intensity. This should be actively managed and mitigated over time through follow up treatments. Evaluate the need for thinning, regeneration removal, and ladder fuel removal every 3 years. This is a shorter evaluation time than other management areas due to the life safety aspect of this treatment.

All Remaining Areas

No action recommended for the remaining forest areas. We recommend that they be monitored for forest health and that the mitigation plan be revisited in approximately 15 years.

Citation: The Ember Alliance. 2023. *Shadow Mountain Bike Park Wildfire Mitigation Hazard Plan*. Fort Collins, CO.

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Hunter, M.E.; Shepperd, W.D.; Lentile, J.E.; Lundquist, J.E.; Andreu, M.G.; Butler, J.L.; Smith, F.W. 2007. A comprehensive guide to fuels treatment practices for ponderosa pine in the Black Hills, Colorado Front Range, and Southwest. Gen. Tech. Rep. RMRS-GTR-198. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 93 p. https://www.firescience.gov/projects/05-S-03/project/05-S-03_05_S_03_Deliverable_02.pdf

U.S. Forest Service. 2012. Spruce-fire Forest Desired Condition. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5409830.pdf

December 8, 2023

Jefferson County – Planning and Zoning
100 Jefferson County Parkway, Suite 3550
Golden, CO 80419
Attn: Dylan Monke, Planner

Re: Shadow Mountain Bike Park - Case No. Case No. 23-102980 RZ

Dear Mr. Monke,

We are in receipt of the First Referral Response Letter from Jefferson County Transportation and Engineering ("**T&E**"), citing a due date of March 24, 2023, as part of the first referral of the application for a special use for the Shadow Mountain Bike Park project (the "**Application**"). We understand that T&E cited concerns related to traffic operations and transportation planning. However, we note that no concerns were noted by T&E with respect to "Drainage" or "Right-of-Way/Roadway Corridor Expansion Projects."

All comments received from T&E were restated in the Planning Engineering Memorandum provided by Jefferson County Planning and Zoning ("**P&Z**"), dated April 10, 2023. The Planning Engineering Memorandum further requires that the Transportation Analysis be updated to address the comments.

In response to the comments received from T&E, and in response to the transportation comments incorporated into the Engineering Memorandum, the following documents are provided:

- Response letter from LSC Transportation Consultants, Inc. dated November 21, 2023, attached hereto as Exhibit A. This letter responds to each comment listed in the T&E Referral Response Letter, and the restated comments included in the Planning Engineering Memorandum.

- Updated Transportation Analysis, "Attachment A - Transportation Consultants Traffic Impact Analysis", which incorporates and addresses the comments listed in the T&E Referral Response Letter. This also addresses the Planning Engineering Memorandum, which also requires these updates to the Transportation Analysis.

Sincerely,

Phil Bouchard

Shadow Mountain Bike Park

Jason Evans

Shadow Mountain Bike Park

Exhibit A

LSC TRANSPORTATION CONSULTANTS, INC.

1889 York Street
Denver, CO 80206
(303) 333-1105
FAX (303) 333-1107
E-mail: lsc@lscdenver.com

November 21, 2023

Mr. Travis Beck
SE Group
tbeck@segroup.com

Re: Shadow Mountain
Bike Park
Jefferson County, CO
LSC #220850

Dear Mr. Beck:

At your request, we have prepared this response to address comments from Jefferson County regarding our December 5, 2022 *Shadow Mountain Bike Park Traffic Impact Analysis*. The following are the comments and our responses:

Comment a: **A full Transportation Impact Study will be required at time of SDP submittal. Follow requirements as outlined in *Transportation Design and Construction Manual*.**

Response: *Comment noted.*

Comment b: **This land use does not align with a trip generation code identified in the ITE 10th Edition. Provide greater justification for 1.5 turnover of vehicles per day using data collected from similar land uses.**

Response: *There are no good local examples of a similar type project and only a handful nationwide. The assumptions were agreed to with the project team and a detailed description provided in the updated study.*

Comment c: **The County does not support the use of left turn acceleration lanes; these shall not be considered as a potential mitigation measure. Revise Table 1a, Table 1b, and any other places in the report which show a mitigated level of service.**

Response: *The recommended acceleration lanes will not be needed if these intersections are improved to be modern roundabouts as noted below in Comment d.*

Comment d: **The County has preliminarily identified the intersections of 73/Barkley and 73/Shadow Mountain for installation of roundabouts. Given the significant impact of the development on these intersections (approximately 25% of the traffic through the intersections will be generated from the**

development), the County will be seeking contribution from the applicant for these public improvements.

Response: *Comment noted.*

Comment e: **Provide a dedicated westbound left turn lane into the development. County regulations require a left turn lane at driveways on major collectors. Shadow Mountain Dr is currently classified as a collector, however the traffic volumes are in the range of a major collector (ADT of 2,000-8,000). Since the Shadow Mountain corridor is effectively functioning as a major collector, and the 85th percentile speed on Shadow Mountain is greater than 45mph, and a significant proportion of traffic on Shadow Mountain will now be westbound left turning traffic at the access point, provide a dedicated westbound left turn lane into the development.**

Response: *The updated analysis includes scenarios with and without this lane because it is not certain it can be provided due to topography and wetland type areas.*

Comment f: **An eastbound right turn acceleration lane shall be evaluated in the Safety section of the forthcoming Transportation Impact Study required at time of SDP submittal. Right turn acceleration lanes may be required where necessary for public safety and traffic operations based upon site specific conditions.**

Response: *The updated analysis includes scenarios with and without this lane for comparison purposes.*

Comment g: **Provide justification for the 1% annual growth rate used for future traffic projections in 2025 and 2042.**

Response: *The 2020 and 2050 DRCOG models both show 4,000 daily trips on Shadow Mountain Road so little or no growth is expected. The annual growth rate was updated to be 0.5 percent to maintain a conservative analysis. A growth rate of one percent was used on County Highway 73 and Barkley Road.*

Comment h: **The value used for % Heavy Vehicles in the Synchro analysis is not reflective of actual expected conditions.**

Response: *This was revisited. The site-generated trips are expected to be primarily passenger vehicles so the additional site traffic will reduce the % Heavy Vehicles for some movements.*

Comment i: **The value used for PHF in the Synchro analysis does not match peak hour factor collected with traffic counts. Use the actual peak hour factors for analysis in existing scenarios; provide justification for peak hour factor used in projected future scenarios.**

Response: *These values were revisited and updated as appropriate.*

Comment j: **Provide explanation in the report for why the Saturday and Sunday PM periods were not analyzed.**

Response: *The majority of visits in the summer season are expected to be in the morning and midday due to frequent thunderstorms in the summer afternoons. The departure from the site towards the end of the day is not expected to be concentrated but rather occur over several hours.*

Comment k: **Show the existing ADT on Figures 3b and 3c.**

Response: *These figures have been updated.*

Comment l: **Provide a new Figure (or modify Figure 3a) so that the ADT used throughout the analysis is clear on the Figure.**

Response: *This figure has been updated.*

Comment m: **Per the narrative, the applicant will work with the local Sheriff and/or Road and Bridge authority within the Right-of-Way to strictly enforce no parking along Shadow Mountain Drive. Please describe the type of work that the applicant is committing to provide.**

Response: *The applicant would inform its guests that no parking is allowed along Shadow Mountain Drive. The applicant is willing to provide appropriate signing to this effect and have a towing company on call to handle violators.*

Comment n: **Provide general explanation for the 0 value hourly counts for Shadow Mtn Drive west of Highway 73 on Tuesday, August 23, 2022 at 1:00 PM until Wednesday, August 24 at 1:00 PM. Provide justification for why this missing data does not affect the analysis and conclusions in the report.**

Response: *The data collection was temporarily stopped due to equipment failure. The days affected were not used to calculate the average volume or in calculating the future volumes.*

Comment o: **The County collected traffic data in November 2022 at the same location as Site 1. The November ADT was 1,840, which is below the ADT that the applicant collected in August 2022. The County affirms that the applicant appropriately used traffic data for the season that would experience the highest background traffic volumes, in addition to the greatest impact from the development, and that this traffic report has therefore considered the peak traffic impacts to the area.**

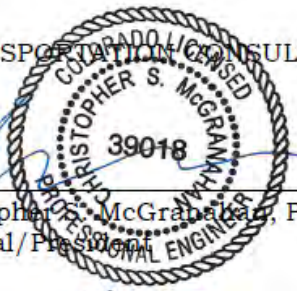
Response: *Comment noted.*

* * * * *

We trust our findings will assist you in gaining approval of the proposed Shadow Mountain Bike Park development. Please contact me if you have any questions or need further assistance.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.



By _____
Christopher S. McGranahan, PE
Principal/President

CSM/wc 11/21/23

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Attachment A: Transportation Consultants Traffic Impact Analysis

LSC TRANSPORTATION CONSULTANTS, INC.

1889 York Street
Denver, CO 80206
(303) 333-1105
FAX (303) 333-1107
E-mail: lsc@lscdenver.com

November 21, 2023

Mr. Travis Beck
SE Group
tbeck@segroup.com

Re: Shadow Mountain
Bike Park
Jefferson County, CO
LSC #220850

Dear Mr. Beck:

In response to your request, LSC Transportation Consultants, Inc. has prepared this traffic impact analysis for the proposed Shadow Mountain Bike Park development to address County comments. As shown on Figure 1, the site is located south of Shadow Mountain Drive about two miles west of County Highway 73 in Jefferson County, Colorado.

REPORT CONTENTS

The report contains the following: the existing roadway and traffic conditions in the vicinity of the site including the lane geometries, traffic controls, posted speed limits, etc.; the existing weekday, Saturday, and Sunday peak-hour traffic volumes; the existing daily traffic volumes in the area; the typical weekday, Saturday, and Sunday site-generated traffic volume projections; the assignment of the projected traffic volumes to the area roadways; the projected long-term background and resulting total traffic volumes on the area roadways; the site's projected traffic impacts; and any recommended roadway improvements to mitigate the site's traffic impacts or the impacts from growth in background traffic.

LAND USE AND ACCESS

The site is proposed to include a downhill mountain bike park with lift service. The site is proposed to have about 300 parking spaces and with about 20 employees. Full movement access is proposed from Shadow Mountain Drive as shown in the conceptual site plan in Figure 2.

The applicant plans to implement ticketing and parking technology to avoid guests arriving with nowhere to park to help reduce impacts to the surrounding area. This process is described as follows:

Parking Reservations

The applicant (SMBP) will implement a parking reservation system that will be available at the time that visitors purchase bike park passes. SMBP will strongly encourage visitors to purchase tickets online prior to arrival, with the goal of making sure visitors do not arrive at the bike

park without a parking reservation. SMBP has decided to implement this system to benefit the visitor experience and surrounding community in the following ways:

1. The parking reservation system will control the amount of riders the bike park sees on any given day, thereby limiting pressure on SMBP's trail network and ensuring the bike park is never over visitor capacity. Limiting visitor capacity will also limit pressure on local roadways, thereby benefitting the surrounding neighborhood as well. The reservation system will allow visitors to relinquish their parking spot when they're done riding so that the parking reservation system stays up-to-date for incoming visitors.

2. The parking reservation system has the ability to reduce the potential for roadway congestion around morning and evening peak-hours because visitors will have a reservation and will have no incentive to rush to SMBP to find parking during opening hours or other peak times.

3. SMBP's parking reservation system will allow staff to closely manage the activity of bike park visitors, which will allow staff to quickly remedy any issues that arise between visitors and residential traffic using the roadways near SMBP.

Cell Phone Service

The base area, in its existing condition, has cell coverage. The rest of the project area has limited coverage. SMBP plans to provide Wifi from the day lodge and work with major providers to improve cell service in the project area for riders.

ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

The major roadways in the site's vicinity are shown on Figure 1 and are described below.

- **County Highway 73** is a north-south, two-lane major collector roadway east of the site. The intersection with Shadow Mountain Drive is stop-sign controlled. The posted speed limit in the vicinity of the site is 40 mph.

- **Shadow Mountain Drive** is an east-west, two-lane collector roadway north of the site. The intersection with County Highway 73 is stop-sign controlled. The posted speed limit in the vicinity of the site is 40 mph but reduces to 30 mph to the east closer to County Highway 73.

- **Barkley Road** is an east-west, two-lane major collector roadway east of the site. The intersection with County Highway 73 is stop-sign controlled. The posted speed limit in the vicinity of the site is 30 mph.

Existing Traffic Conditions

Figure 3a shows the existing lane geometries, traffic controls, and traffic volumes in the site's vicinity on a typical weekday afternoon peak-hour and the daily traffic volumes for five consecutive days. Figures 3b and 3c show the typical peak-hour and daily traffic volumes on a

Saturday and Sunday, respectively. The peak-hour traffic volumes and daily traffic counts are from the attached traffic counts conducted by Counter Measures in August, 2022.

2025 and 2043 Background Traffic

Figure 4a shows the estimated 2025 weekday background traffic which assumes an annual growth rate of one-half percent on Shadow Mountain Drive and one percent on Highway 73 and Barkley Road to maintain a conservative analysis. DRCOG (Denver Regional Council of Governments) shows minimal growth is expected on Shadow Mountain Drive over time. Figure 4b shows the estimated 2025 Saturday background traffic which assumes an annual growth rate of one-half percent on Shadow Mountain Drive and one percent on Highway 73 and Barkley Road to maintain a conservative analysis. Figure 4c shows the estimated 2025 Sunday background traffic which assumes an annual growth rate of one percent. The Sunday daily volumes are based on multiplying the Sunday peak-hour rates by the ratio of Saturday peak-hour trips to Saturday daily trips.

Figure 5a shows the estimated 2043 weekday background traffic; Figure 5b shows the estimated 2043 Saturday background traffic; and Figure 5c shows the estimated 2043 Sunday background traffic. These 2043 background volumes assume an annual growth rate of one percent.

Existing, 2025, and 2043 Background Levels of Service

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from "A" to "F." LOS A is indicative of little congestion or delay and LOS F is indicative of a high level of congestion or delay. Attached are specific level of service definitions for unsignalized intersections.

The intersections in Figures 3a through 5c were analyzed as appropriate to determine the existing, 2025 background, and 2043 background levels of service using Synchro. Table 1a shows the existing and 2025 level of service analysis results and Table 1b shows the 2043 level of service results. The level of service reports are attached.

1. **Shadow Mountain Drive/County Highway 73:** All movements at this unsignalized intersection currently operate at LOS "D" or better during all five scenarios and are expected to do so through 2025. By 2043, the intersection is planned to be converted to a modern roundabout and is expected to operate at an overall LOS "A" during all scenarios.

2. **County Highway 73/Barkley Road:** All movements at this unsignalized intersection currently operate at LOS "D" or better during all five scenarios with the following exception: The southwestbound to southeastbound left-turn movement operates at LOS "F" during the weekday afternoon peak-hour and the Saturday mid-day peak-hour. By 2025, the southwestbound left-turn movement is expected to operate at LOS "E" or "F" during the weekday afternoon peak-hour, and the Saturday morning and mid-day peak-hour. By 2043, the intersection is planned to be converted to a modern roundabout and is expected to operate at an overall LOS "A" during all scenarios.

3. **Shadow Mountain Drive/Site Access:** This unsignalized intersection was analyzed only in the total traffic scenarios.

TRIP GENERATION

Table 2 shows the estimated trip generation for the proposed site per the rates developed by LSC based on coordination with the applicant and project team.

The site is projected to generate about 520 vehicle-trips on the average weekday, with about half entering and half exiting during a 24-hour period. During the morning peak-hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 115 vehicles would enter and about 11 vehicles would exit the site. During the afternoon peak-hour, which generally occurs for one hour between 4:00 and 6:00 p.m., about 8 vehicles would enter and about 80 vehicles would exit.

On the average Saturday and Sunday, the site is projected to generate up to about 1,000 vehicle-trips with about half entering and half exiting during a 24-hour period. During the morning peak-hour, which generally occurs for one hour between 8:30 and 10:30 a.m., about 220 vehicles would enter and about 21 vehicles would exit the site. During the mid-day peak-hour, which generally occurs for one hour between 12:00 and 2:00 p.m., about 15 vehicles would enter and about 155 vehicles would exit.

The average daily traffic during the peak season is expected to be between 520 and 1,000 trips; most weekdays are expected to have 520 or fewer trips.

Details on Vehicle Turnover

This report assumes a vehicle/parking stall turnover estimate of 1.6 (i.e., a parking stall will have 1.6 vehicles parked each day). This estimate is based on a number of factors, including trail mileage, vertical relief, chairlift length, lap time, number of laps/visit, vehicular travel distance to bike park, ticket type (day pass vs. season pass), and length of stay. Specifically, based on these factors, it is estimated that an average lap would be approximately 30 minutes, the average number of laps would be 8 laps, and the amount of milling time (i.e., parking, ticketing, break time/lunch) would be approximately 1 hour. With this information, the average guest would stay approximately 5 hours. For an average operating time of 8 hours, the average vehicle turnover would be the average operating time divided by the average guest stay. This results in an average turnover of 1.6, meaning that on days with a full parking lot, about 60 percent of the spaces could be vacated and then replaced by another vehicle.

The average vehicle turnover is a planning metric used to inform traffic and parking estimates. In this study, it directly informs the average number of vehicles entering and exiting the parking lot and thus the average vehicle trips per day, however, has a less direct correlation with peak traffic patterns because it applies to the full day of operation. Because of the uniqueness of the operation and the variety of planning factors considered to determine the vehicular turnover, there is not an “industry-standard” planning metric.

TRIP DISTRIBUTION

Figure 6 shows the estimated directional distribution of the site-generated traffic volumes on the area roadways. The estimates were based on the location of the site with respect to the regional population, employment, and activity centers; and the site’s proposed land use.

TRIP ASSIGNMENT

Figure 7a shows the estimated weekday site-generated traffic volumes based on the weekday trip generation estimate (from Table 2) and the directional distribution in Figure 6.

Figure 7b shows the estimated Saturday/Sunday site-generated traffic volumes based on the Saturday/Sunday trip generation estimate (from Table 2) and the directional distribution in Figure 6.

2025 AND 2043 TOTAL TRAFFIC

Figure 8a shows the 2025 weekday total traffic which is the sum of the 2025 weekday background traffic volumes (from Figure 4a) and the weekday site-generated traffic volumes (from Figure 7a). Figure 8a also shows the recommended lane geometry and traffic control.

Figure 8b shows the 2025 Saturday total traffic which is the sum of the 2025 Saturday background traffic volumes (from Figure 4b) and the weekend site-generated traffic volumes (from Figure 7b). Figure 8b also shows the recommended lane geometry and traffic control.

Figure 8c shows the 2025 Sunday total traffic which is the sum of the 2025 Sunday background traffic volumes (from Figure 4c) and the weekend site-generated traffic volumes (from Figure 7b). Figure 8c also shows the recommended lane geometry and traffic control.

Figure 9a shows the 2043 weekday total traffic which is the sum of the 2043 weekday background traffic volumes (from Figure 5a) and the weekday site-generated traffic volumes (from Figure 7a). Figure 9a also shows the recommended lane geometry and traffic control.

Figure 9b shows the 2043 Saturday total traffic which is the sum of the 2043 Saturday background traffic volumes (from Figure 5b) and the weekend site-generated traffic volumes (from Figure 7b). Figure 9b also shows the recommended lane geometry and traffic control.

Figure 9c shows the 2043 Sunday total traffic which is the sum of the 2043 Sunday background traffic volumes (from Figure 5c) and the weekend site-generated traffic volumes (from Figure 7b). Figure 9c also shows the recommended lane geometry and traffic control.

PROJECTED LEVELS OF SERVICE

The intersections in Figures 8a through 9c were analyzed to determine the 2025 and 2043 total traffic levels of service. Table 1a shows the existing and 2025 total level of service analysis results and Table 1b shows the 2043 total level of service results. The level of service reports are attached.

1. **Shadow Mountain Drive/County Highway 73:** All movements at this unsignalized intersection are expected to operate at LOS “D” or better during all five scenarios through 2043 with the following exception: The northeastbound left-turn movement is expected to operate at LOS “E” or “F” during three of the five scenarios by 2025. By 2043, the intersection is planned to be converted to a modern roundabout by Jefferson County and is expected to operate at an overall LOS “B” or better during all scenarios.

2. **County Highway 73/Barkley Road:** All movements at this unsignalized intersection are expected to operate at LOS "D" or better during all five scenarios through 2043 with the following exception: The southwestbound left-turn movement is expected to operate at LOS "E" or "F" during four of the five scenarios in 2025 and 2043. By 2043, the intersection is planned to be converted to a modern roundabout by Jefferson County and is expected to operate at an overall LOS "C" or better during all scenarios.

3. **Shadow Mountain Drive/Site Access:** All movements at this unsignalized intersection are expected to operate at LOS "A" during all five scenarios through 2043.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

1. The site is projected to generate about 520 vehicle-trips on the average weekday, with about half entering and half exiting during a 24-hour period. During the morning peak-hour, about 115 vehicles would enter and about 11 vehicles would exit the site. During the afternoon peak-hour, about 8 vehicles would enter and about 80 vehicles would exit.

2. On the average Saturday and Sunday, the site is projected to generate up to about 1,000 vehicle-trips with about half entering and half exiting during a 24-hour period. During the morning peak-hour, about 220 vehicles would enter and about 21 vehicles would exit the site. During the mid-day peak-hour, about 15 vehicles would enter and about 155 vehicles would exit

Projected Levels of Service

3. All movements at the unsignalized intersections analyzed are expected to operate at LOS "D" or better through 2043 in all five scenarios with the following exceptions: The northeastbound left-turn movement at the Shadow Mountain Drive/County Highway 73 and the southwestbound left-turn movement at the County Highway 73/Barkley Road intersection are expected to operate at LOS "E" or "F" during several of the five scenarios. By 2043, both intersections are planned to be converted to modern roundabouts and are expected to operate at an overall LOS "C" or better during all scenarios. It is important to note that minimal site traffic is expected to make the movements with poor levels of service.

Recommendations

4. The recommended improvements to mitigate poor levels of service are shown in Figure 10. These future roundabouts are planned by Jefferson County; the Applicant would work with the County to agree upon a contribution for these improvements. Figure 10 shows the peak season site-generated trips will comprise about 15 percent of Saturday peak-hour trips at the northern roundabout and about 12 percent at the southern roundabout. These percentages will be lower on weekdays and during the off-season.

* * * * *

We trust our findings will assist you in gaining approval of the proposed Shadow Mountain Bike Park development. Please contact me if you have any questions or need further assistance.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

By _____
Christopher S. McGranahan, PE
Principal/President

CSM/wc

Enclosures: Tables 1a through 2
Figures 1 - 10
Traffic Count Reports
Level of Service Definitions
Level of Service Reports

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Table 1a
Intersection Levels of Service Analysis - Existing and 2025
Shadow Mountain Bike Park
Jefferson County, CO
LSC #220850; November, 2023

Intersection No. & Location	Traffic Control	Existing Traffic					2025 Background					2025 Total				
		Weekday	Saturday		Sunday		Weekday	Saturday		Sunday		Weekday	Saturday		Sunday	
		Level of Service PM	Level of Service AM	Level of Service Mid-Day	Level of Service AM	Level of Service Mid-Day	Level of Service PM	Level of Service AM	Level of Service Mid-Day	Level of Service AM	Level of Service Mid-Day	Level of Service PM	Level of Service AM	Level of Service Mid-Day	Level of Service AM	Level of Service Mid-Day
1) Shadow Mountain Drive/County Highway 73	TWSC															
NEB Left		D	C	D	B	C	D	C	D	B	C	F	E	E	D	D
NEB Right		B	B	B	B	B	B	B	B	B	B	B	B	C	B	B
NWB Left		A	A	A	A	A	A	A	A	A	A	B	A	A	A	A
Critical Movement Delay		30.4	17.2	30.7	14.7	22.6	31.7	17.5	32.4	14.9	23.5	50.6	36.8	39.0	30.4	26.8
2) County Highway 73/Barkley Road	TWSC															
SEB Left		A	A	B	A	A	A	A	B	A	A	A	A	B	A	A
SWB Left		F	D	F	C	D	F	E	F	C	D	F	E	F	C	E
SWB Right		B	B	B	B	B	B	B	B	B	B	C	B	B	B	B
Critical Movement Delay		74.3	33.8	186.0	18.2	25.9	86.1	37.6	233.5	18.8	27.4	102.8	48.1	>240	20.8	49.8
3) Shadow Mountain Drive/Site Access	TWSC															
NB Approach		--	--	--	--	--	--	--	--	--	--	A	A	A	A	A
WB Approach		--	--	--	--	--	--	--	--	--	--	A	A	A	A	A
Critical Movement Delay		--	--	--	--	--	--	--	--	--	--	8.7	8.9	9.8	8.9	9.7

Table 1b
Intersection Levels of Service Analysis
Shadow Mountain Bike Park- 2043
Jefferson County, CO
LSC #220850; November, 2023

		2043 Background					2043 Total				
		Weekday	Saturday		Sunday		Weekday	Saturday		Sunday	
Intersection No. & Location	Traffic Control	Level of Service PM	Level of Service AM	Level of Service Mid-Day	Level of Service AM	Level of Service Mid-Day	Level of Service PM	Level of Service AM	Level of Service Mid-Day	Level of Service AM	Level of Service Mid-Day
1) Shadow Mountain Drive/County Highway 73	Roundabout										
SEB Approach		B	A	B	A	A	B	A	B	A	A
NWB Apporach		A	A	A	A	A	A	A	A	A	A
NEB Approach		A	A	A	A	A	A	A	B	A	A
Entire Intersection Delay		9.1	6.1	9.1	5.4	7.4	11.3	8.4	10.4	7.4	8.1
Entire Intersection LOS		A	A	A	A	A	B	A	B	A	A
2) County Highway 73/Barkley Road	Roundabout										
SEB Approach		B	A	B	A	A	B	A	C	A	A
NWB Approach		A	A	C	A	A	A	A	D	A	B
SWB Approach		B	A	A	A	A	B	B	A	A	A
Entire Intersection Delay		10.4	7.8	13.5	5.9	8.0	11.6	9.9	20.0	7.0	9.6
Entire Intersection LOS		B	A	B	A	A	B	A	C	A	A
3) Shadow Mountain Drive/Site Access	TWSC										
NB Approach		--	--	--	--	--	A	A	A	A	A
WB Approach		--	--	--	--	--	A	A	A	A	A
Critical Movement Delay		--	--	--	--	--	8.8	8.9	9.9	8.9	9.8

Table 2
ESTIMATED TRAFFIC GENERATION
Shadow Mountain Bike Park
Jefferson County, CO
LSC #220850; November, 2023

	Vehicle-Trips Generated									
	Weekday					Saturday & Sunday				
		AM Peak-Hour [2]		PM Peak-Hour [2]			AM Peak-Hour [2]		PM Peak-Hour [2]	
Trip Generating Category	Daily [1]	In	Out	In	Out	Daily [1]	In	Out	In	Out
Guests	480	105	11	8	75	960	210	21	15	150
Employees	40	10	0	0	5	40	10	0	0	5
Total [3] =	**520**	**115**	**11**	**8**	**80**	**1,000**	**220**	**21**	**15**	**155**

Notes:

(1) Assumes 300 parking spaces and a 1.6 turn over ratio for a total of 480 round-trips on the weekend with half that usage on a typical weekday. Assumes 20 employees with 20 round-trips.

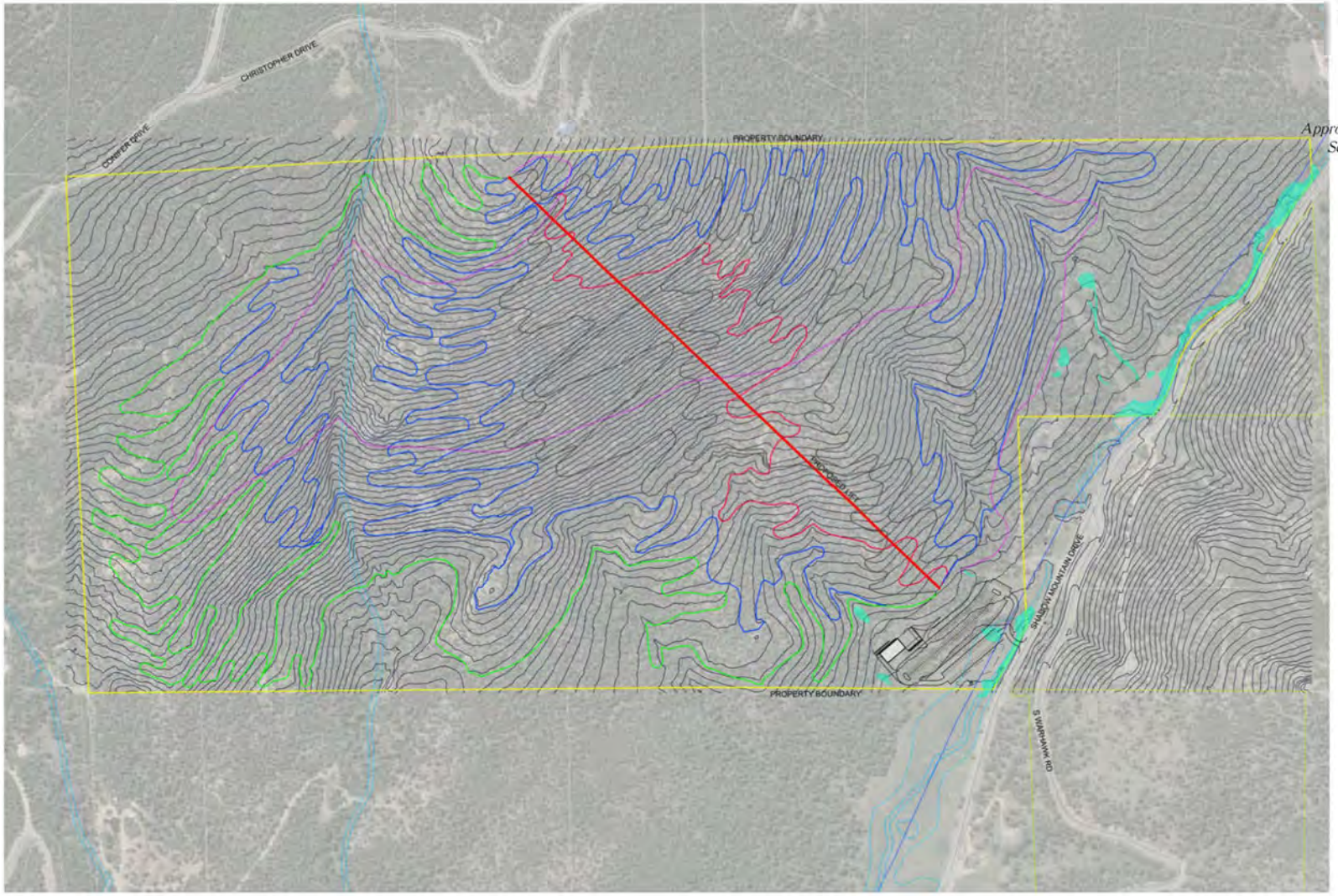
(2) Assumes 70 percent of arrival trips occur during the weekday afternoon peak-hour or Saturday/Sunday morning peak-hour with ten percent being dropped off and 50 percent of departure trips occur during the weekend midday peak-hour with ten percent being dropped off. Assumes half of the employees arrive during the peak-hour and a quarter depart during the peak-hour.

(3) The average daily traffic for the site during the peak season is expected to be between 520 and 1,000 trips considering most weekdays are expected to have 520 or fewer trips per day.

Figure 1

Vicinity Map

Shadow Mountain Bike Park (LSC #220850)



Approximate Scale
Scale: NTS

Figure 2a

Note: This site plan is conceptual in size, layout and location. It is subject to change through subsequent review processes, and final design will avoid impacts to wetlands.

Overall Site Plan

Shadow Mountain Bike Park (LSC #220850)

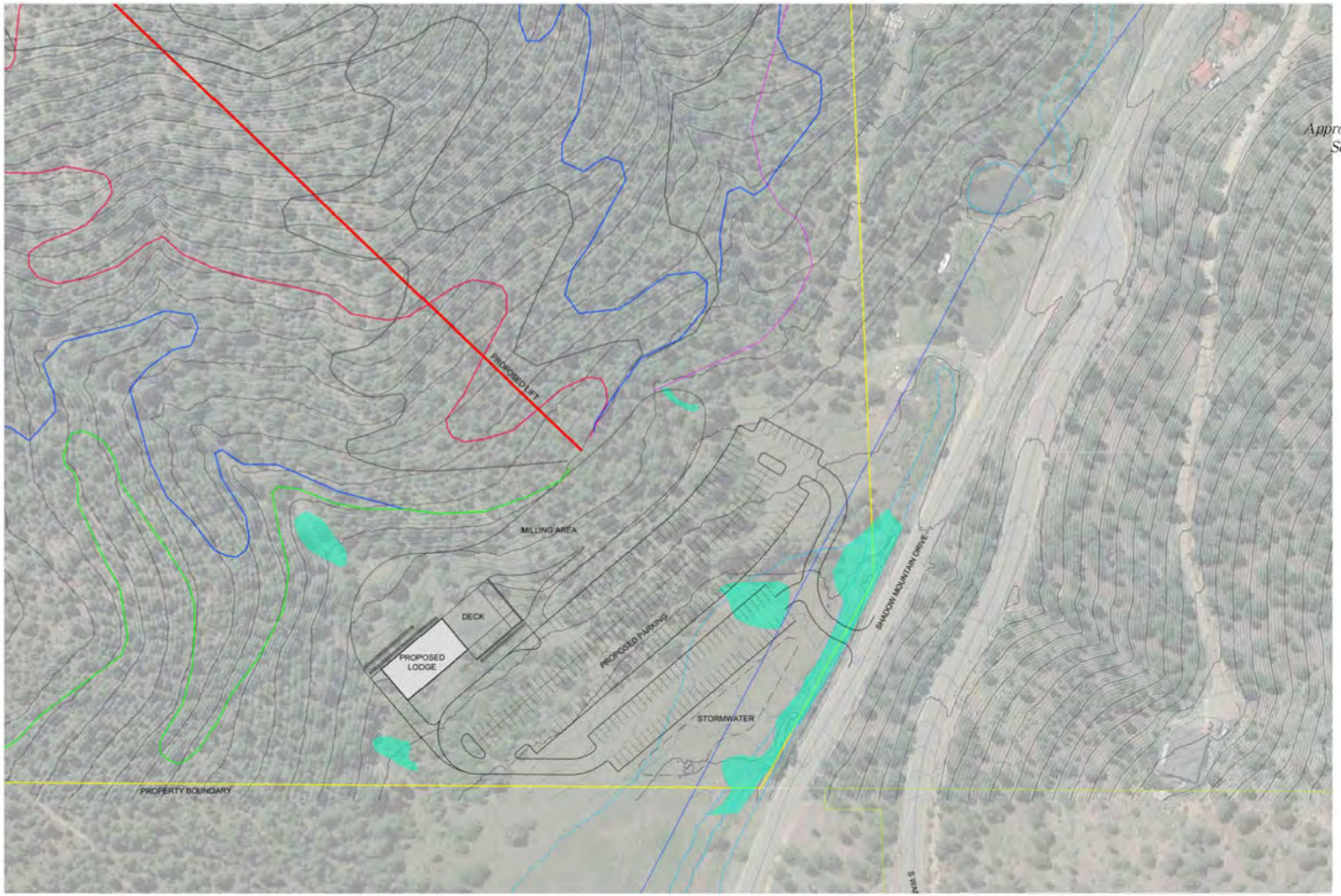
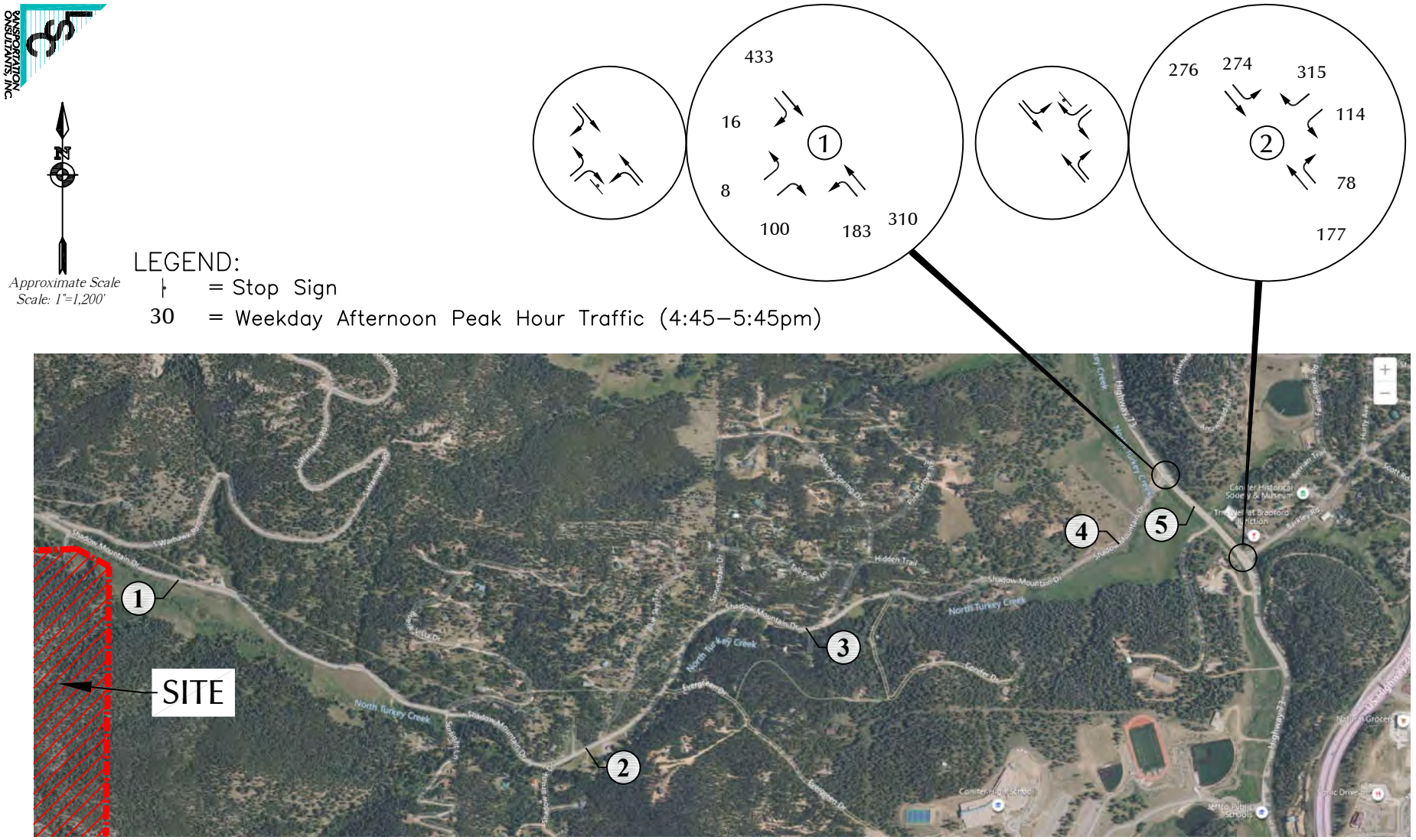


Figure 2b

Note: This site plan is conceptual in size, layout and location. It is subject to change through subsequent review processes, and final design will avoid impacts to wetlands.

Parking Lot & Access Detail

Shadow Mountain Bike Park (LSC #220850)



(1) Tues 8/23/2022 = 2,455
Wed 8/24/2022 = 2,525
Thur 8/25/2022 = 2,405
Fri 8/26/2022 = 2,365

(2) Tues 8/23/2022 = 2,680
Wed 8/24/2022 = 2,750
Thur 8/25/2022 = 2,655
Fri 8/26/2022 = 2,625

(3) Tues 8/23/2022 = 3,170
Wed 8/24/2022 = 3,220
Thur 8/25/2022 = 3,120
Fri 8/26/2022 = 3,125

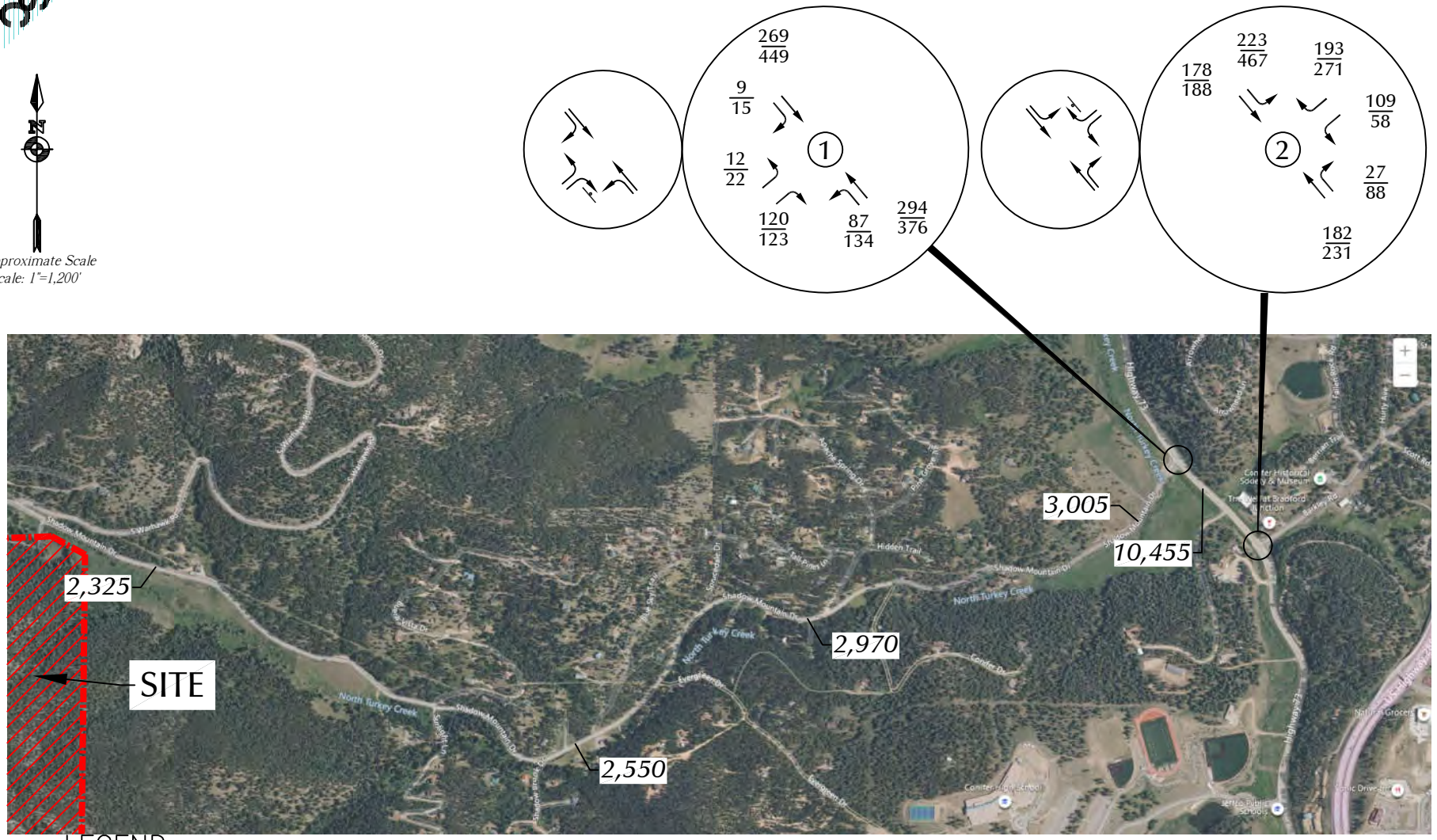
(4) Tues 8/23/2022 = No Data
Wed 8/24/2022 = No Data
Thur 8/25/2022 = 3,155
Fri 8/26/2022 = 3,160

(5) Tues 8/23/2022 = 11,390
Wed 8/24/2022 = 11,380
Thur 8/25/2022 = 11,205
Fri 8/26/2022 = 11,470

Figure 3a

Existing Weekday Peak Hour & All Daily Traffic

Shadow Mountain Bike Park (LSC #220850)



LEGEND:

= Stop Sign

$\frac{26}{35}$ = Saturday Morning Peak Hour Traffic (9:00am–10:00am) / Saturday Midday Peak Hour Traffic (12:00pm–1:00pm)

30 = Saturday Peak Hour Traffic

Figure 3b

Existing Saturday Peak Hour Traffic

Shadow Mountain Bike Park (LSC #220850)

Approximate Scale
Scale: 1"=1,200'

LEGEND:

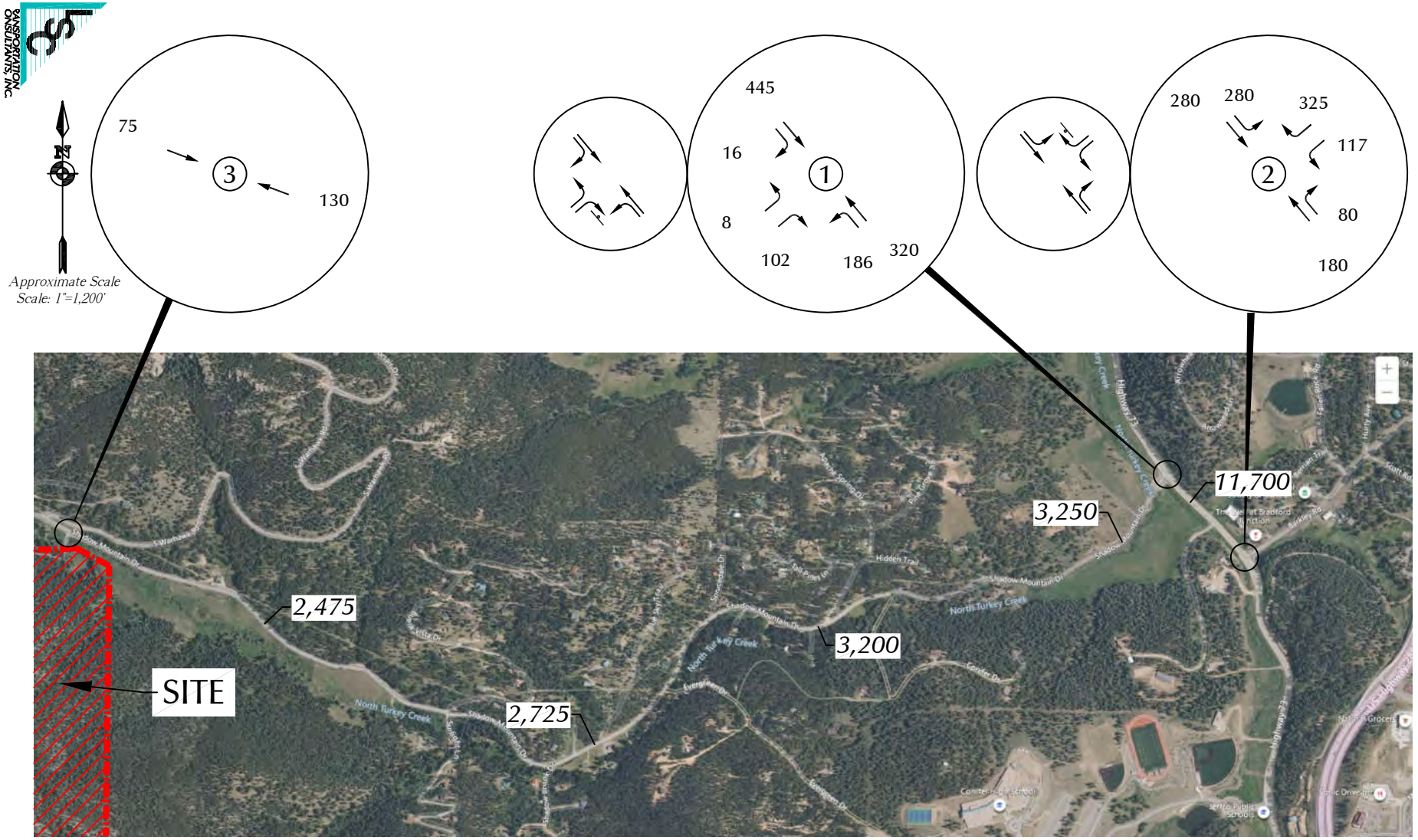
= Stop Sign

$\frac{26}{35}$ = Sunday Morning Peak Hour Traffic (9:00am–10:00am) / Sunday Midday Peak Hour Traffic (12:30pm–1:30pm)

Figure 3c

Existing Sunday Peak Hour Traffic

Shadow Mountain Bike Park (LSC #220850)



LEGEND:

= Stop Sign

30 = Weekday Afternoon Peak Hour Traffic (4:45–5:45pm)

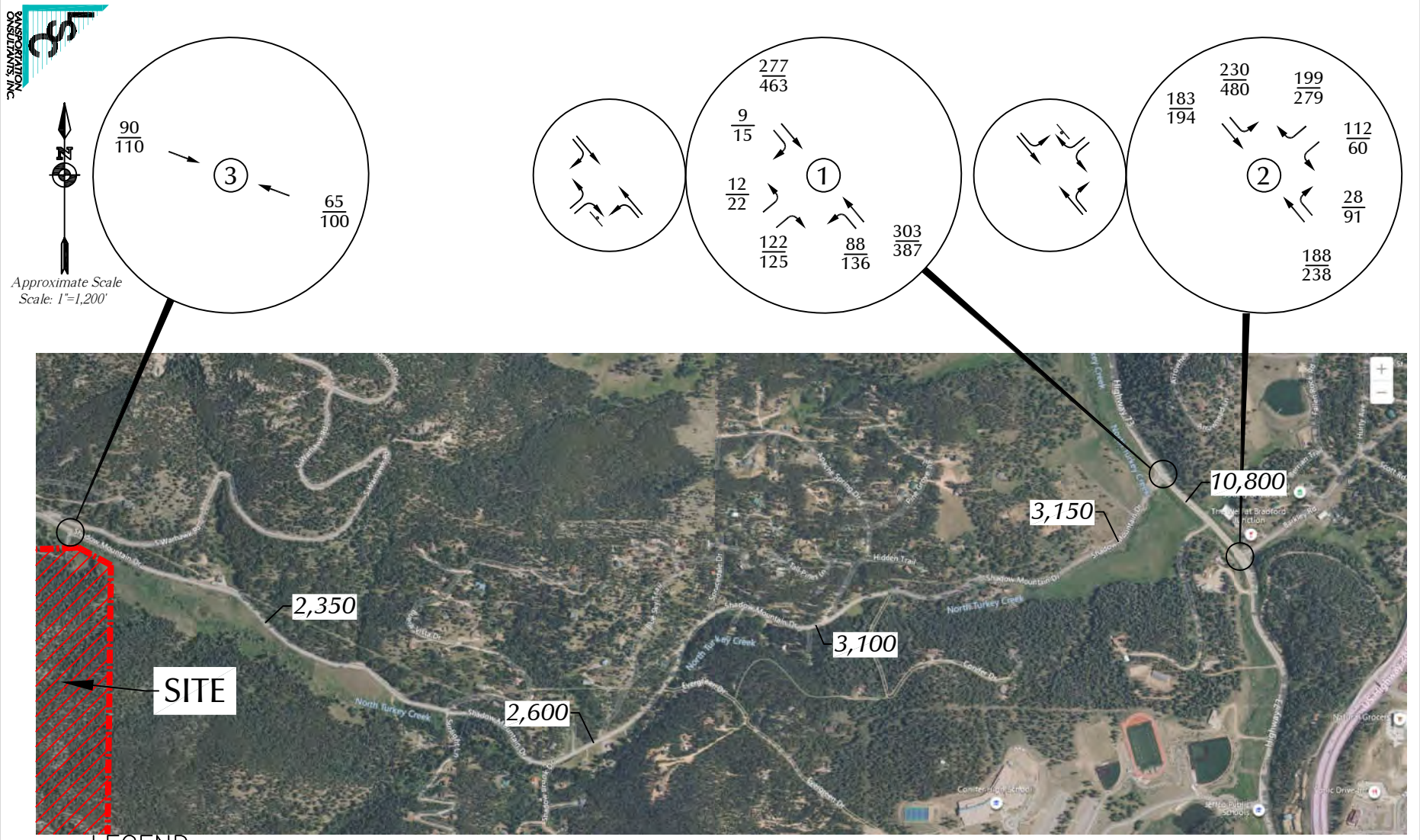
Note: Assumes annual growth rate of one half percent on Shadow Mountain Drive and one percent on Highway 73 and Barkley Road to maintain a conservative analysis because DRCOG model predicts little or no growth on Shadow Mountain Drive.

DRCOG = Denver Regional Council of Governments

Figure 4a

Year 2025 Weekday Background Traffic

Shadow Mountain Bike Park (LSC #220850)



LEGEND:

⊦ = Stop Sign

$\frac{26}{35}$ = $\frac{\text{Saturday Morning Peak Hour Traffic (9:00am–10:00am)}}{\text{Saturday Midday Peak Hour Traffic (12:00pm–1:00pm)}}$

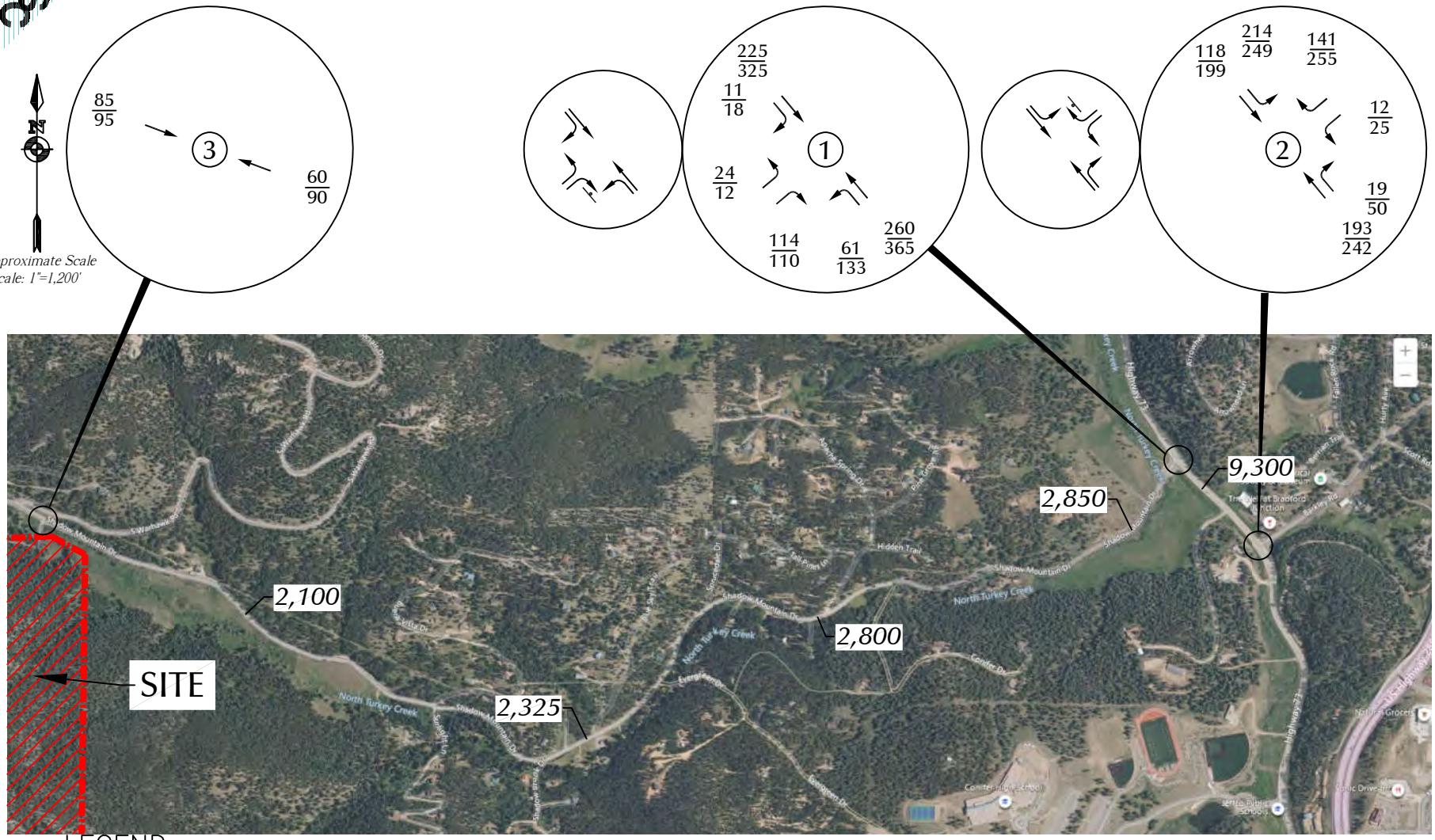
Note: Assumes annual growth rate of one half percent on Shadow Mountain Drive and one percent on Highway 73 and Barkley Road to maintain a conservative analysis because DRCOG model predicts little or no growth on Shadow Mountain Drive.

DRCOG = Denver Regional Council of Governments

Figure 4b

Year 2025 Saturday Background Traffic

Shadow Mountain Bike Park (LSC #220850)



LEGEND:

⊦ = Stop Sign

$\frac{26}{35}$ = $\frac{\text{Saturday Morning Peak Hour Traffic (9:00am–10:00am)}}{\text{Saturday Midday Peak Hour Traffic (12:00pm–1:00pm)}}$

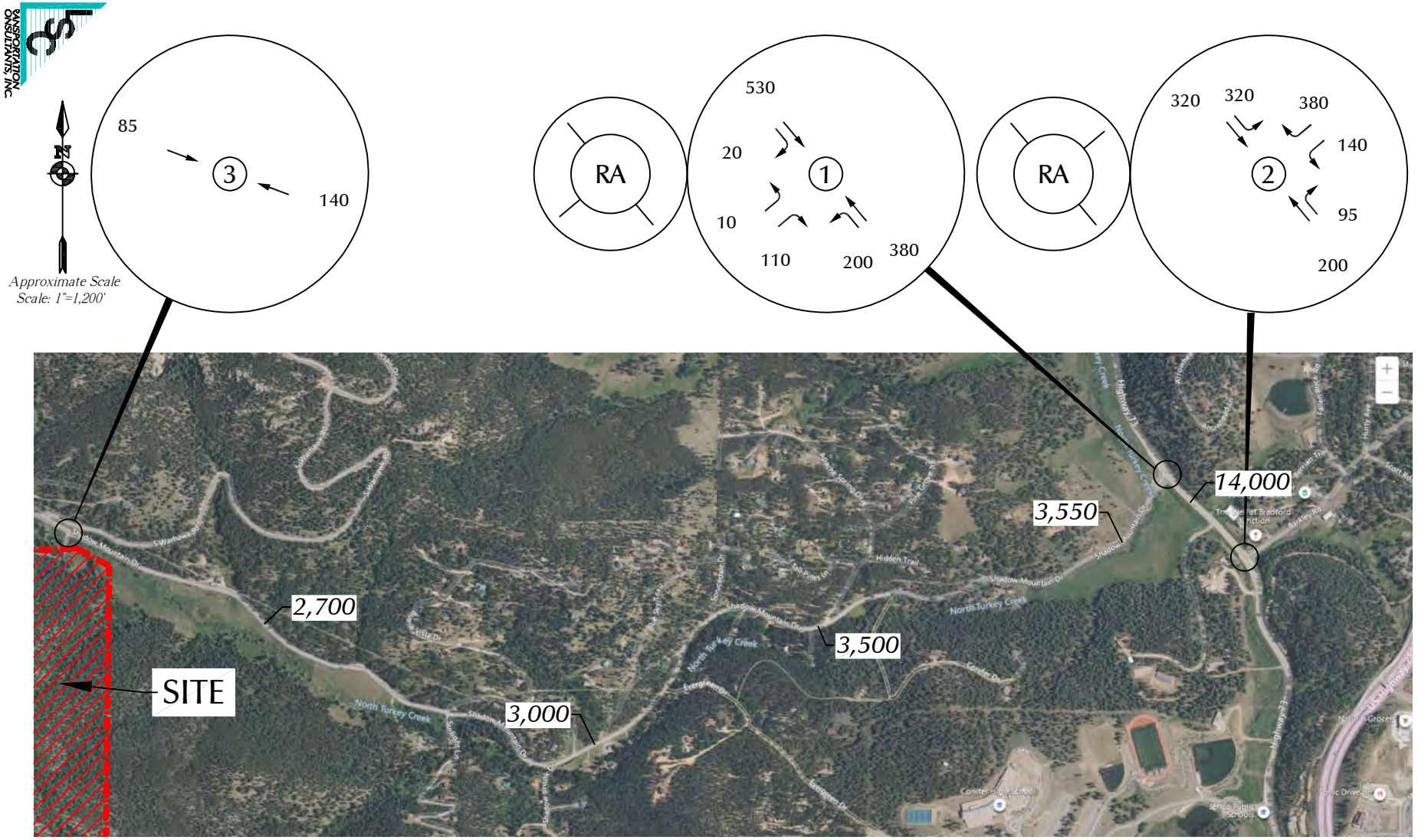
Note: Assumes annual growth rate of one half percent on Shadow Mountain Drive and one percent on Highway 73 and Barkley Road to maintain a conservative analysis because DRCOG model predicts little or no growth on Shadow Mountain Drive. Daily volumes based on ratio of Saturday peak hour trips to Saturday daily trips.

DRCOG = Denver Regional Council of Governments

Figure 4c

Year 2025 Sunday Background Traffic

Shadow Mountain Bike Park (LSC #220850)



LEGEND:

= Stop Sign

30 = Weekday Afternoon Peak Hour Traffic (4:45–5:45pm)

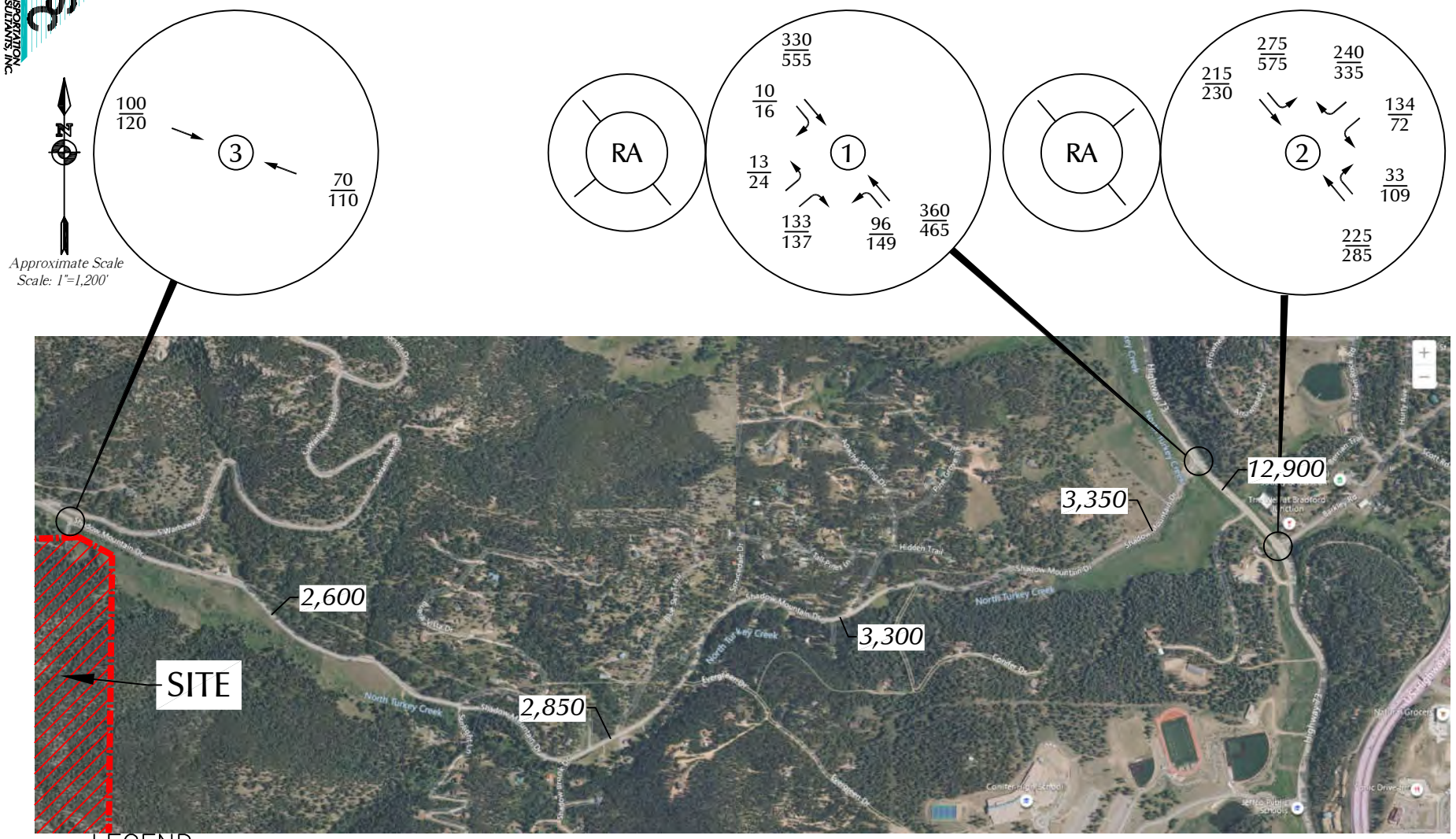
Notes:

1. Assumes annual growth rate of one half percent on Shadow Mountain Drive and one percent on Highway 73 and Barkley Road.
2. Assumes roundabout control at Intersection #1 and #2 per feedback from Jefferson County.

Figure 5a

Year 2043 Weekday Background Traffic

Shadow Mountain Bike Park (LSC #220850)



LEGEND:

= Stop Sign

$\frac{26}{35}$ = Saturday Morning Peak Hour Traffic (9:00am–10:00am) / Saturday Midday Peak Hour Traffic (12:00pm–1:00pm)

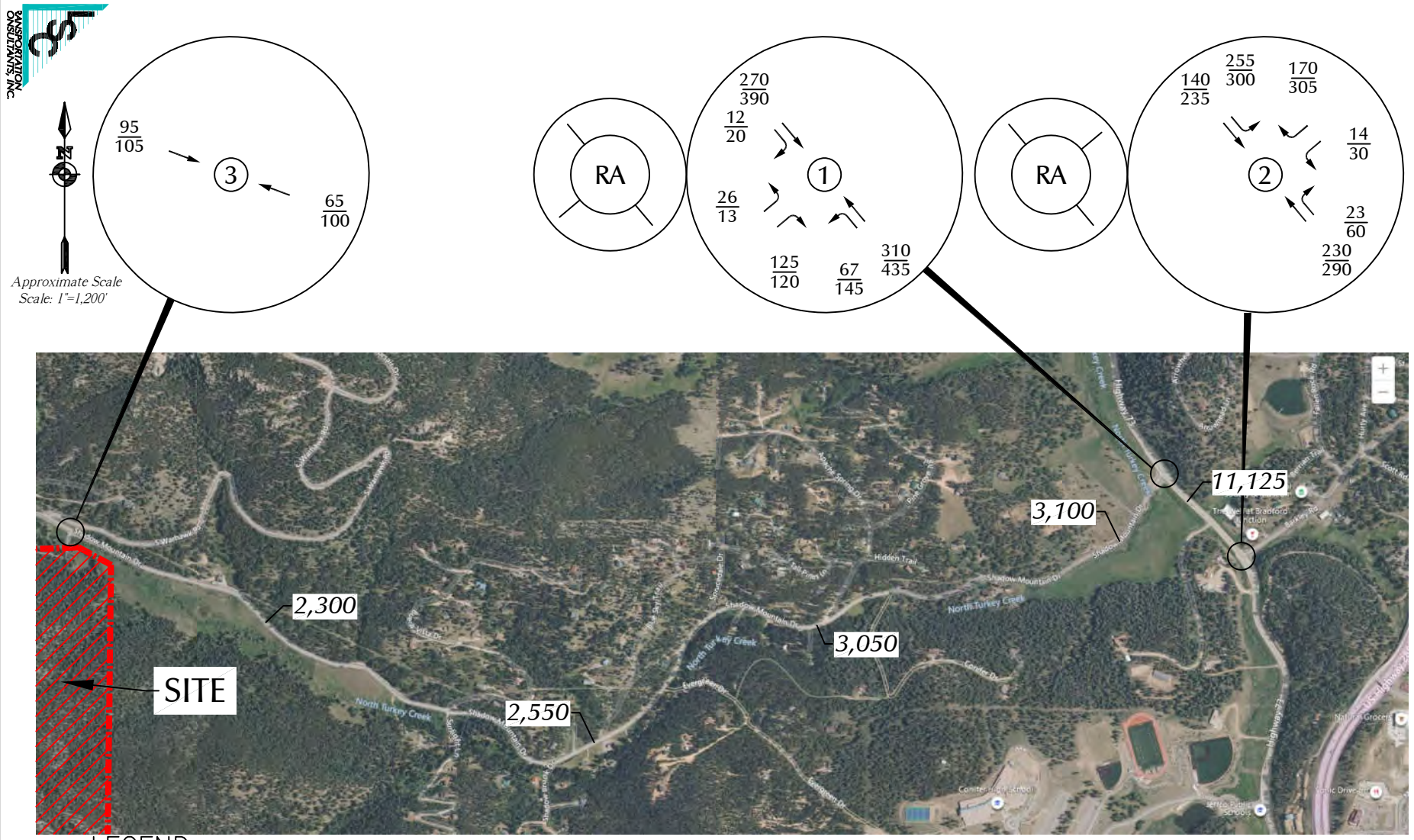
Notes:

1. Assumes annual growth rate of one half percent on Shadow Mountain Drive and one percent on Highway 73 and Barkley Road.
2. Assumes roundabout control at Intersection #1 and #2 per feedback from Jefferson County.

Figure 5b

Year 2043
Saturday Background Traffic

Shadow Mountain Bike Park (LSC #220850)



LEGEND:

= Stop Sign

$\frac{26}{35}$ = $\frac{\text{Sunday Morning Peak Hour Traffic (9:00am–10:00am)}}{\text{Sunday Midday Peak Hour Traffic (12:30pm–1:30pm)}}$

Notes:

1. Assumes annual growth rate of one half percent on Shadow Mountain Drive and one percent on Highway 73 and Barkley Road.
2. Assumes roundabout control at Intersection #1 and #2 per feedback from Jefferson County.

Figure 5c

Year 2043 Sunday Background Traffic

Shadow Mountain Bike Park (LSC #220850)

Approximate Scale
Scale: 1"=3,000'

LEGEND:

65% = Percent Directional Distribution

Figure 6

Directional Distribution of Site-Generated Traffic

Shadow Mountain Bike Park (LSC #220850)

LEGEND:

$\frac{26}{35}$ = $\frac{\text{Weekday Morning Peak Hour Traffic}}{\text{Weekday Afternoon Peak Hour Traffic}}$

Figure 7a

Assignment of Weekday Site-Generated Traffic

Shadow Mountain Bike Park (LSC #220850)

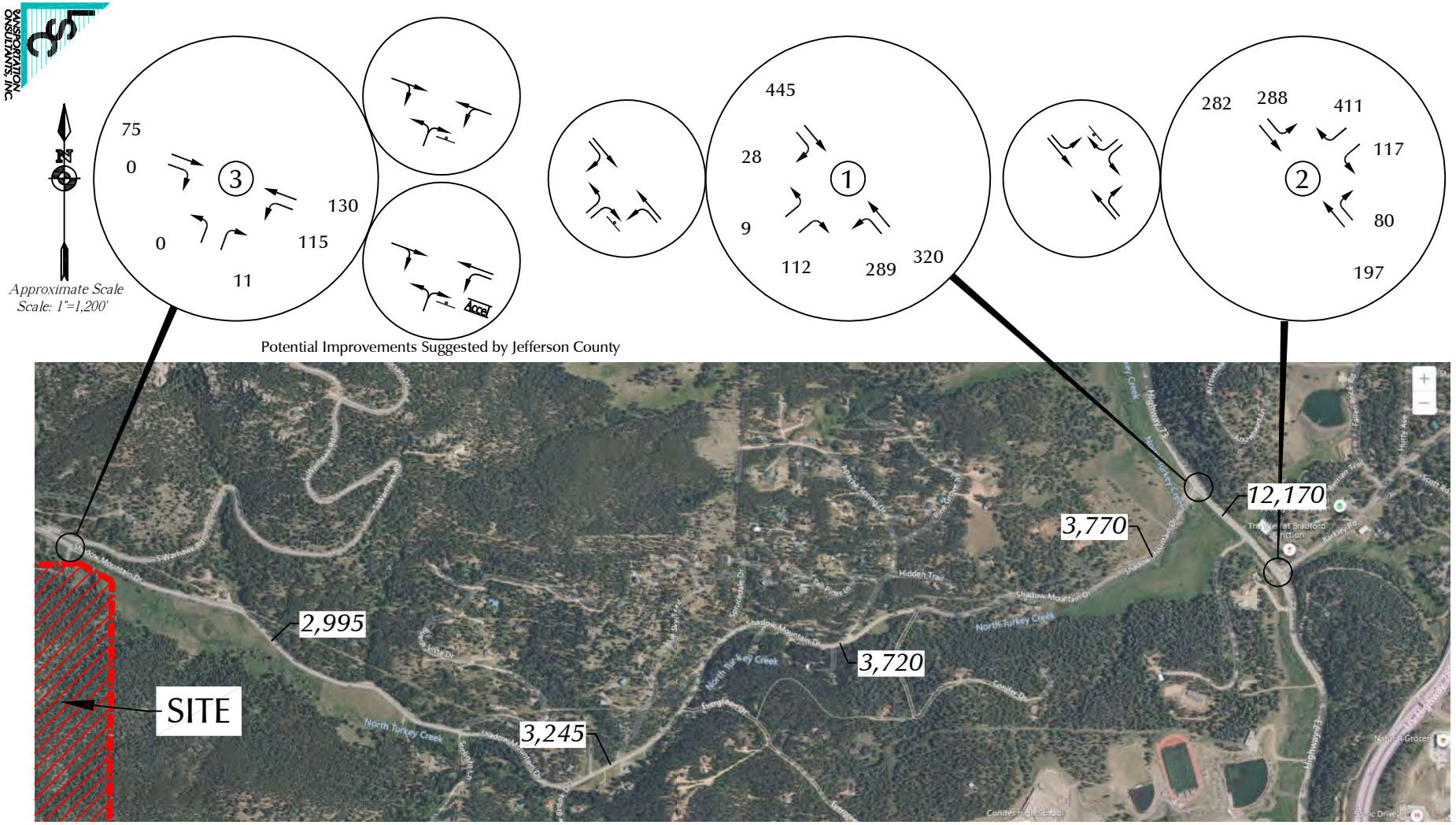
LEGEND:

$\frac{26}{35}$ = $\frac{\text{Weekend Morning Peak Hour Traffic}}{\text{Weekend Afternoon Peak Hour Traffic}}$

Figure 7b

Assignment of Weekend Site-Generated Traffic

Shadow Mountain Bike Park (LSC #220850)



LEGEND:

| = Stop Sign

30 = Weekday Afternoon Peak Hour Traffic (4:45–5:45pm)

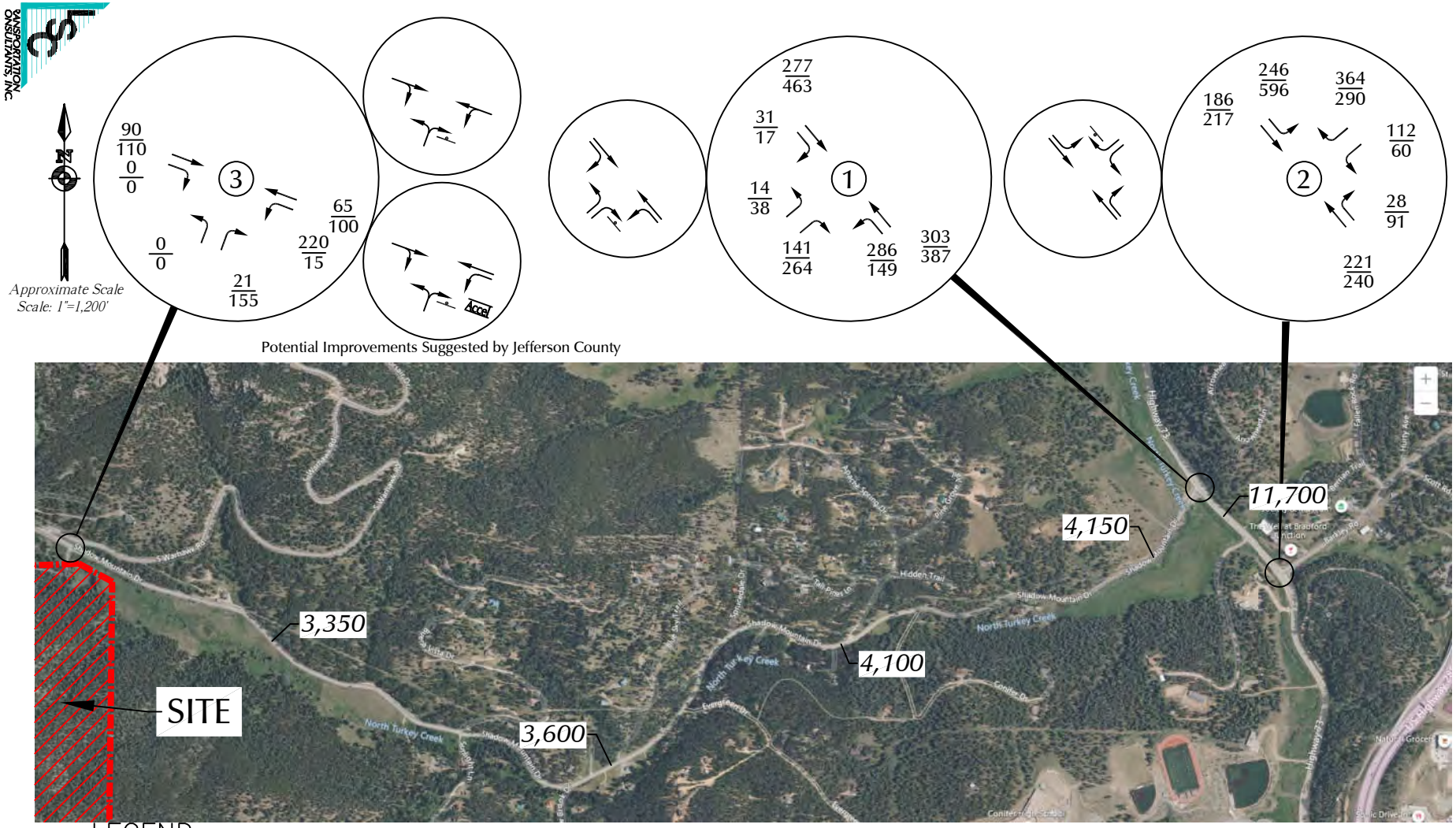
Notes:

1. These volumes are the sum of the volumes in Figures 4a and 7a.
2. The potential site access improvements suggested by Jefferson County are a left-turn lane for ingress and a right-turn acceleration lane for egress. The acceleration lane is not expected to provide much benefit but a left-turn lane for ingress could be beneficial if there are no existing constraints preventing it such as right-of-way or wetland limitations. An appropriate length for a left-turn lane would be 275 feet plus a 160-foot transition taper and 45:1 redirect taper.

Figure 8a

Year 2025 Weekday Total Traffic

Shadow Mountain Bike Park (LSC #220850)



LEGEND:

= Stop Sign

$\frac{26}{35}$ = $\frac{\text{Saturday Morning Peak Hour Traffic (9:00am–10:00am)}}{\text{Saturday Midday Peak Hour Traffic (12:00pm–1:00pm)}}$

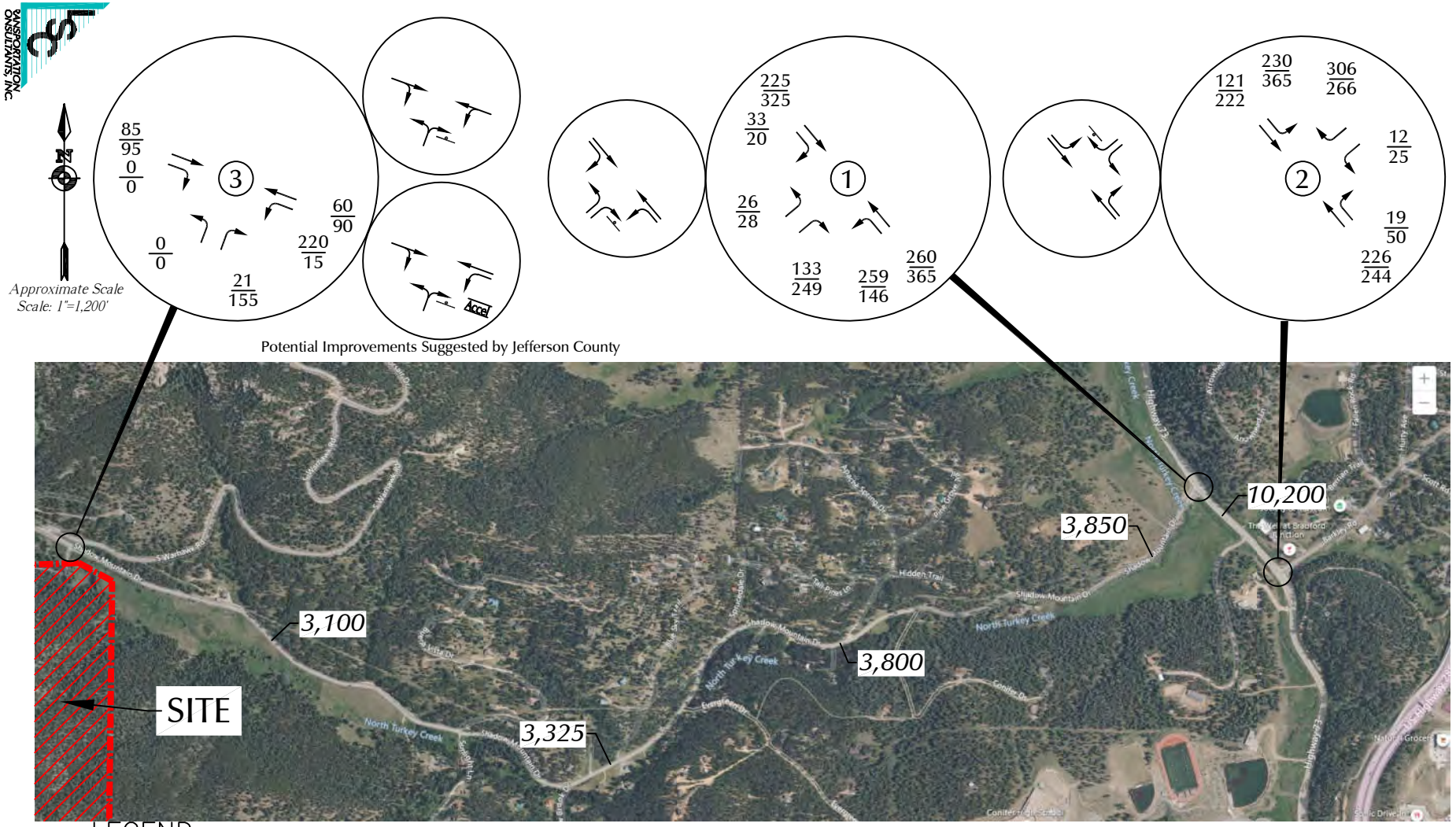
Notes:

1. These volumes are the sum of the volumes in Figures 4b and 7b.
2. The potential site access improvements suggested by Jefferson County are a left-turn lane for ingress and a right-turn acceleration lane for egress. The acceleration lane is not expected to provide much benefit but a left-turn lane for ingress could be beneficial if there are no existing constraints preventing it such as right-of-way or wetland limitations. An appropriate length for a left-turn lane would be 275 feet plus a 160-foot transition taper and 45:1 redirect taper.

Figure 8b

Year 2025 Saturday Total Traffic

Shadow Mountain Bike Park (LSC #220850)



LEGEND:

⊦ = Stop Sign

$\frac{26}{35}$ = $\frac{\text{Sunday Morning Peak Hour Traffic (9:00am–10:00am)}}{\text{Sunday Midday Peak Hour Traffic (12:30pm–1:30pm)}}$

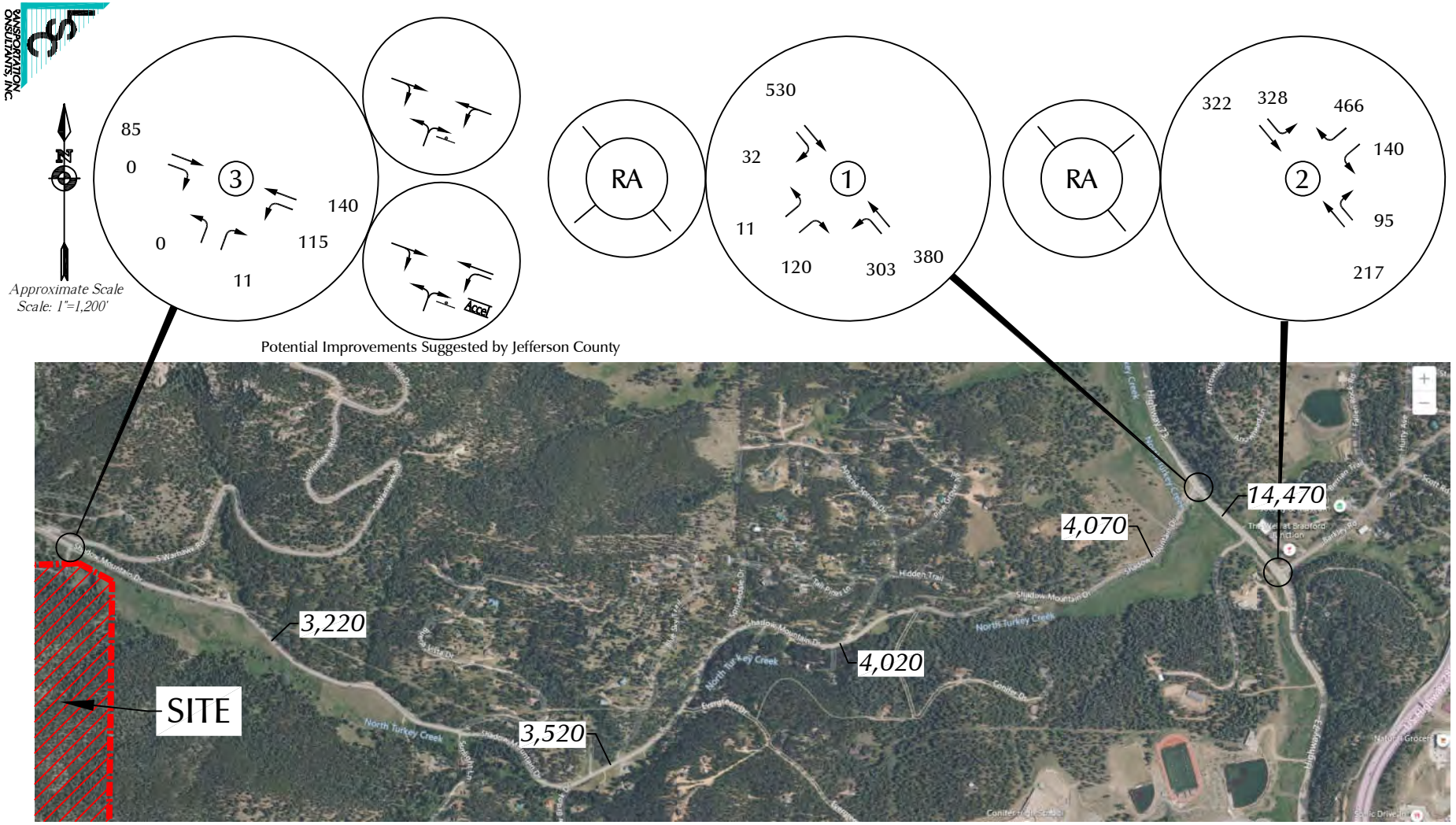
Notes:

1. These volumes are the sum of the volumes in Figures 4c and 7b.
2. The potential site access improvements suggested by Jefferson County are a left-turn lane for ingress and a right-turn acceleration lane for egress. The acceleration lane is not expected to provide much benefit but a left-turn lane for ingress could be beneficial if there are no existing constraints preventing it such as right-of-way or wetland limitations. An appropriate length for a left-turn lane would be 275 feet plus a 160-foot transition taper and 45:1 redirect taper.

Figure 8c

Year 2025 Sunday Total Traffic

Shadow Mountain Bike Park (LSC #220850)



LEGEND:

| | = Stop Sign

30 = Weekday Afternoon Peak Hour Traffic (4:45–5:45pm)

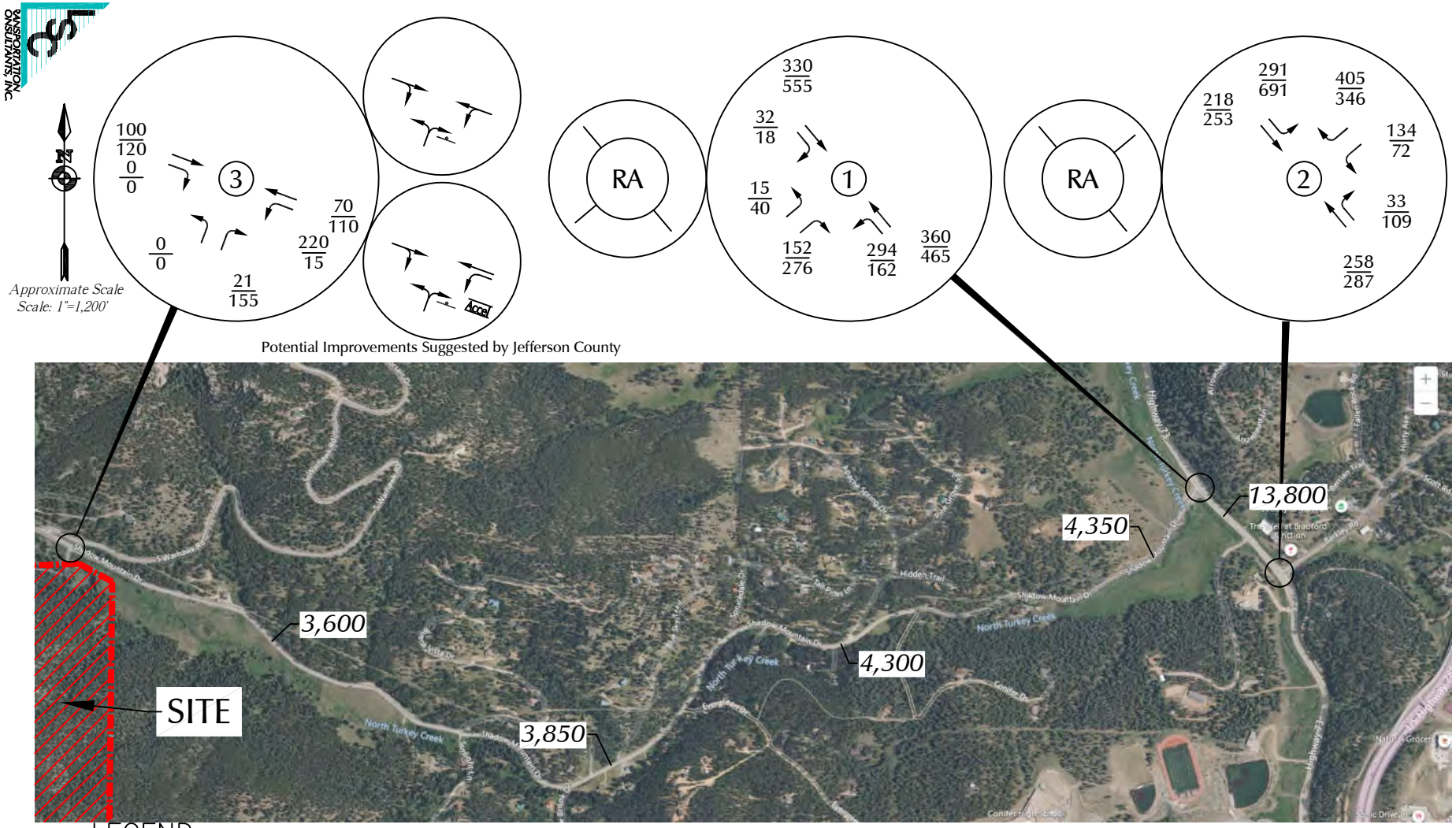
Notes:

1. These volumes are the sum of the volumes in Figures 5a and 7a.
2. The potential site access improvements suggested by Jefferson County are a left-turn lane for ingress and a right-turn acceleration lane for egress. The acceleration lane is not expected to provide much benefit but a left-turn lane for ingress could be beneficial if there are no existing constraints preventing it such as right-of-way or wetland limitations. An appropriate length for a left-turn lane would be 275 feet plus a 160-foot transition taper and 45:1 redirect taper.

Figure 9a

Year 2043 Weekday Total Traffic

Shadow Mountain Bike Park (LSC #220850)



LEGEND:

⊦ = Stop Sign

$\frac{26}{35}$ = $\frac{\text{Saturday Morning Peak Hour Traffic (9:00am–10:00am)}}{\text{Saturday Midday Peak Hour Traffic (12:00pm–1:00pm)}}$

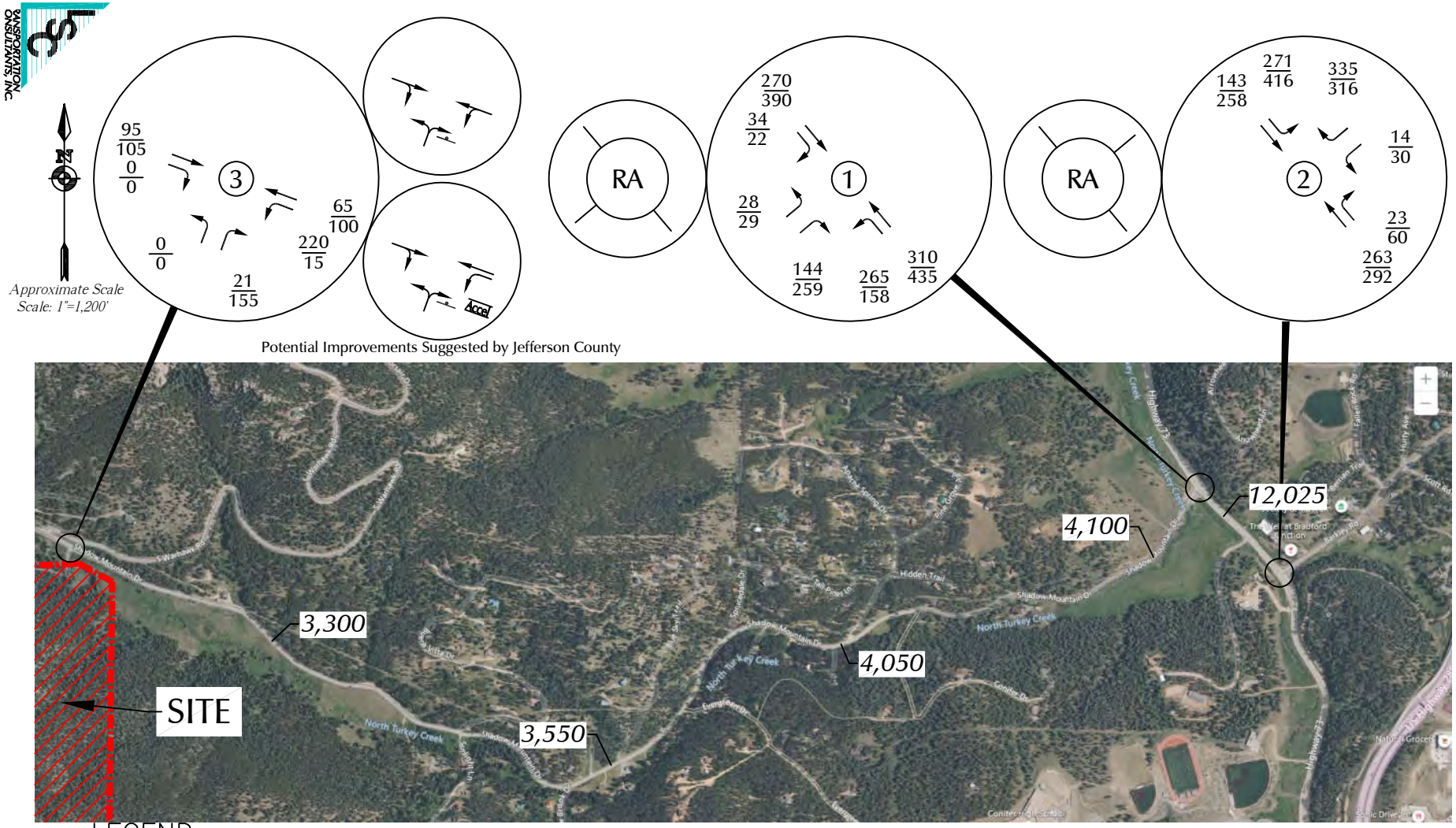
Notes:

1. These volumes are the sum of the volumes in Figures 5b and 7b.
2. The potential site access improvements suggested by Jefferson County are a left-turn lane for ingress and a right-turn acceleration lane for egress. The acceleration lane is not expected to provide much benefit but a left-turn lane for ingress could be beneficial if there are no existing constraints preventing it such as right-of-way or wetland limitations. An appropriate length for a left-turn lane would be 275 feet plus a 160-foot transition taper and 45:1 redirect taper.

Figure 9b

Year 2043 Saturday Total Traffic

Shadow Mountain Bike Park (LSC #220850)



LEGEND:

= Stop Sign

$\frac{26}{35}$ = $\frac{\text{Sunday Morning Peak Hour Traffic (9:00am–10:00am)}}{\text{Sunday Midday Peak Hour Traffic (12:30pm–1:30pm)}}$

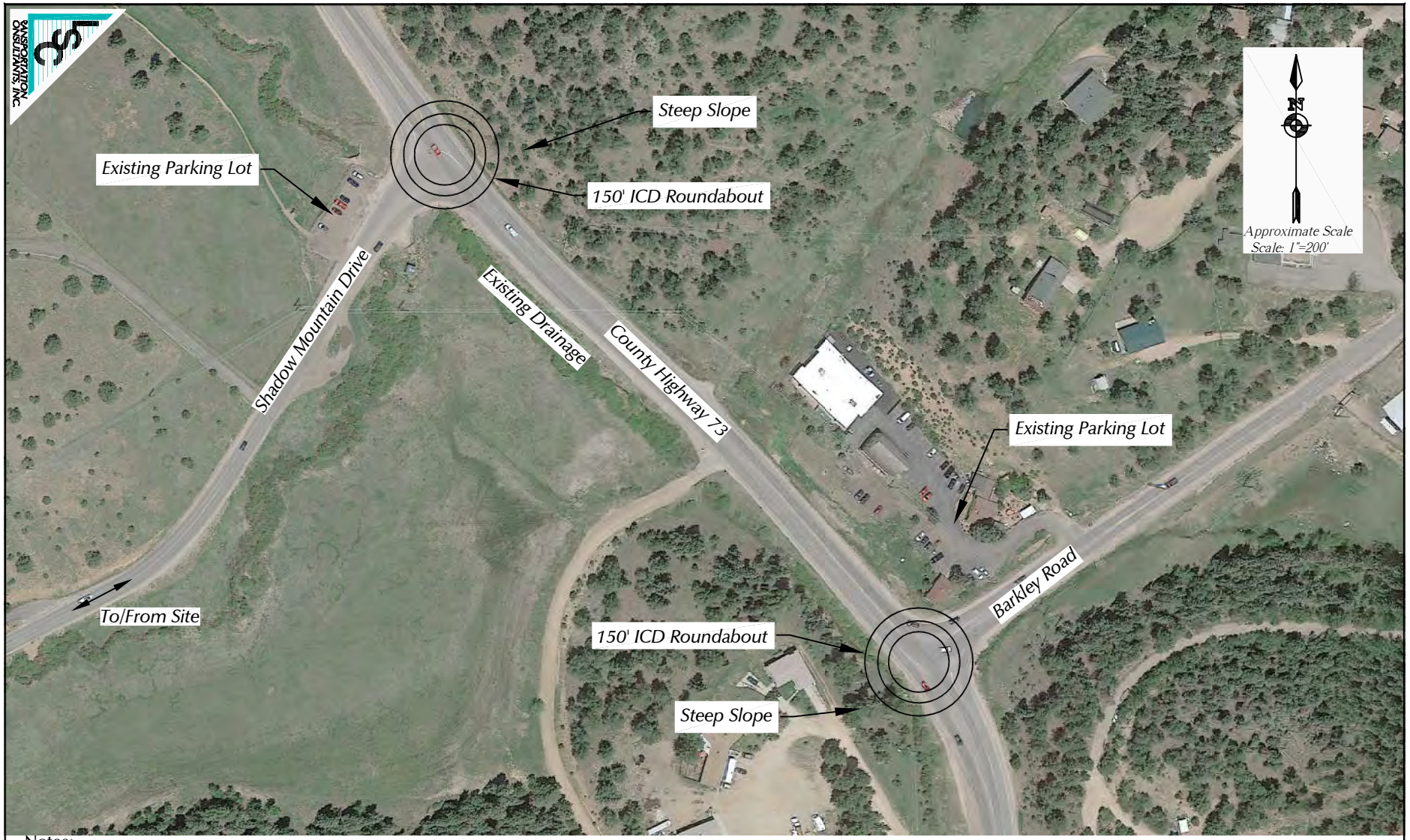
Notes:

1. These volumes are the sum of the volumes in Figures 5c and 7b.
2. The potential site access improvements suggested by Jefferson County are a left-turn lane for ingress and a right-turn acceleration lane for egress. The acceleration lane is not expected to provide much benefit but a left-turn lane for ingress could be beneficial if there are no existing constraints preventing it such as right-of-way or wetland limitations. An appropriate length for a left-turn lane would be 275 feet plus a 160-foot transition taper and 45:1 redirect taper.

Figure 9c

Year 2043 Sunday Total Traffic

Shadow Mountain Bike Park (LSC #220850)



Notes:

1. The recommended mitigation over time is to construct a single lane roundabout at both locations consistent with feedback from Jefferson County.
2. Some of the potential design constraints are labeled above.
3. The site-generated trips are expected to comprise about 15 percent of Saturday peak hour trips by 2043 at CR73/Shadow Mountain Drive. This percentage will be much lower on weekdays and in the off-season.
4. The site-generated trips are expected to comprise about 12 percent of Saturday peak hour trips by 2043 at CR 73/Barkley Road. This percentage will be much lower on weekdays and in the off-season.

Figure 10

Potential Improvements Along CH 73 Based on County Feedback

Shadow Mountain Bike Park (LSC #220850)

COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: HWY 73
E/W STREET: BARKLEY RD
CITY: CONIFER
COUNTY: JEFFERSON

File Name : HWY73BARK
Site Code : 00000025
Start Date : 8/24/2022
Page No : 1

Groups Printed- VEHICLES

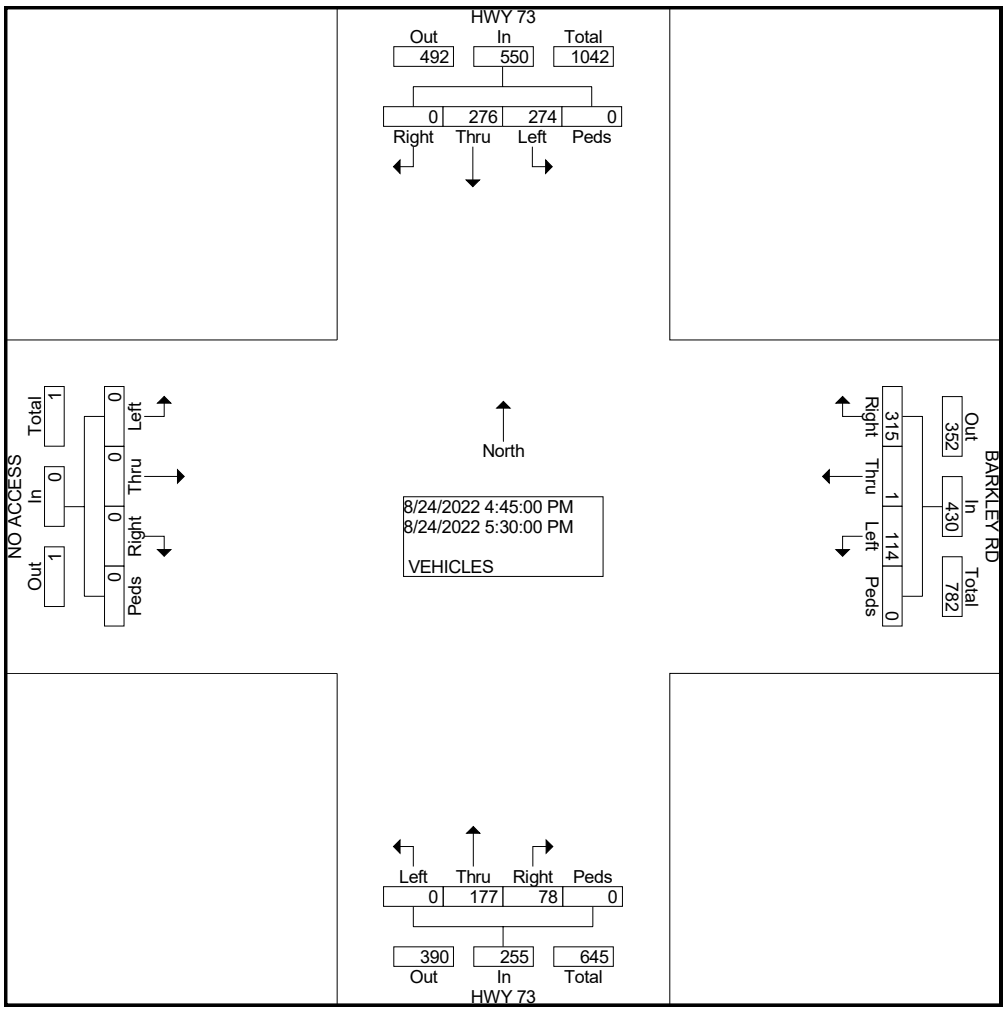
	HWY 73 Southbound				BARKLEY RD Westbound				HWY 73 Northbound				NO ACCESS Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
04:00 PM	66	69	0	0	8	0	59	0	0	51	9	0	0	0	0	0	262
04:15 PM	67	56	0	0	7	0	65	0	0	51	15	1	0	0	0	0	262
04:30 PM	65	50	0	0	12	0	66	0	0	50	22	0	0	0	0	0	265
04:45 PM	66	65	0	0	25	0	96	0	0	31	19	0	0	0	0	0	302
Total	264	240	0	0	52	0	286	0	0	183	65	1	0	0	0	0	1091
05:00 PM	66	76	0	0	32	1	84	0	0	43	16	0	0	0	0	0	318
05:15 PM	63	74	0	0	36	0	70	0	0	44	20	0	0	0	0	0	307
05:30 PM	79	61	0	0	21	0	65	0	0	59	23	0	0	0	0	0	308
05:45 PM	68	60	0	0	12	0	82	0	0	47	22	0	0	0	0	0	291
Total	276	271	0	0	101	1	301	0	0	193	81	0	0	0	0	0	1224
Grand Total	540	511	0	0	153	1	587	0	0	376	146	1	0	0	0	0	2315
Apprch %	51.4	48.6	0.0	0.0	20.6	0.1	79.2	0.0	0.0	71.9	27.9	0.2	0.0	0.0	0.0	0.0	
Total %	23.3	22.1	0.0	0.0	6.6	0.0	25.4	0.0	0.0	16.2	6.3	0.0	0.0	0.0	0.0	0.0	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: HWY 73
E/W STREET: BARKLEY RD
CITY: CONIFER
COUNTY: JEFFERSON

File Name : HWY73BARK
Site Code : 00000025
Start Date : 8/24/2022
Page No : 2

	HWY 73 Southbound					BARKLEY RD Westbound					HWY 73 Northbound					NO ACCESS Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:45 PM																				
Volume	274	276	0	0	550	114	1	315	0	430	0	177	78	0	255	0	0	0	0	0	1235
Percent	49.8	50.2	0.0	0.0		26.5	0.2	73.3	0.0		0.0	69.4	30.6	0.0		0.0	0.0	0.0	0.0		
05:00 Volume	66	76	0	0	142	32	1	84	0	117	0	43	16	0	59	0	0	0	0	0	318
Peak Factor																					0.971
High Int.	05:00 PM					04:45 PM					05:30 PM					3:45:00 PM					
Volume	66	76	0	0	142	25	0	96	0	121	0	59	23	0	82						
Peak Factor					0.968					0.888					0.777						



COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: SHADOW MTN DR
E/W STREET: HWY 73
CITY: CONIFER
COUNTY: JEFFERSON

File Name : SHAD73PM2
Site Code : 00000020
Start Date : 8/24/2022
Page No : 1

Groups Printed- VEHICLES

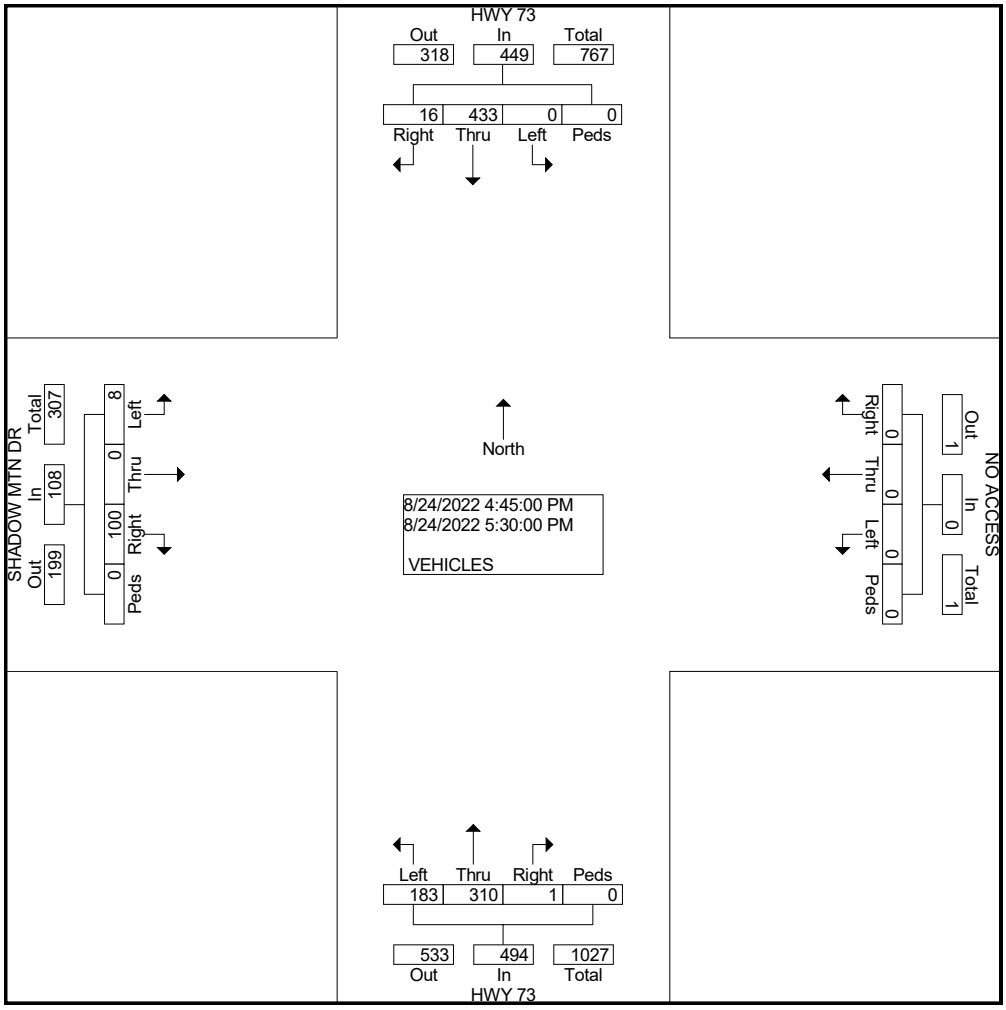
	HWY 73 Southbound				NO ACCESS Westbound				HWY 73 Northbound				SHADOW MTN DR Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
04:00 PM	0	101	4	0	0	0	0	0	30	85	0	0	7	0	20	0	247
04:15 PM	0	98	6	0	0	0	0	0	44	77	0	1	4	0	27	0	257
04:30 PM	0	95	6	0	0	0	0	0	40	82	0	0	7	0	19	0	249
04:45 PM	0	101	6	0	0	0	0	0	56	73	0	0	6	0	25	0	267
Total	0	395	22	0	0	0	0	0	170	317	0	1	24	0	91	0	1020
05:00 PM	0	121	4	0	0	0	0	0	32	89	1	0	1	0	23	0	271
05:15 PM	0	104	5	0	0	0	0	0	45	68	0	0	1	0	30	0	253
05:30 PM	0	107	1	0	0	0	0	0	50	80	0	0	0	0	22	0	260
05:45 PM	0	101	7	0	0	0	0	0	43	91	0	0	1	0	24	0	267
Total	0	433	17	0	0	0	0	0	170	328	1	0	3	0	99	0	1051
Grand Total	0	828	39	0	0	0	0	0	340	645	1	1	27	0	190	0	2071
Apprch %	0.0	95.5	4.5	0.0	0.0	0.0	0.0	0.0	34.4	65.3	0.1	0.1	12.4	0.0	87.6	0.0	
Total %	0.0	40.0	1.9	0.0	0.0	0.0	0.0	0.0	16.4	31.1	0.0	0.0	1.3	0.0	9.2	0.0	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: SHADOW MTN DR
E/W STREET: HWY 73
CITY: CONIFER
COUNTY: JEFFERSON

File Name : SHAD73PM2
Site Code : 00000020
Start Date : 8/24/2022

	HWY 73 Southbound					NO ACCESS Westbound					HWY 73 Northbound					SHADOW MTN DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:45 PM																				
Volume	0	433	16	0	449	0	0	0	0	0	183	310	1	0	494	8	0	100	0	108	1051
Percent	0.0	96.4	3.6	0.0		0.0	0.0	0.0	0.0		37.0	62.8	0.2	0.0		7.4	0.0	92.6	0.0		
05:00 Volume	0	121	4	0	125	0	0	0	0	0	32	89	1	0	122	1	0	23	0	24	271
Peak Factor																					0.970
High Int.	05:00 PM					3:45:00 PM					05:30 PM					04:45 PM					
Volume	0	121	4	0	125	0	0	0	0	0	50	80	0	0	130	6	0	25	0	31	
Peak Factor					0.898										0.950					0.871	



COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: HWY 73
E/W STREET: BARKLEY RD
CITY: CONIFER
COUNTY: JEFFERSON

File Name : HWY73BARK0827
Site Code : 00000013
Start Date : 8/27/2022
Page No : 1

Groups Printed- VEHICLES

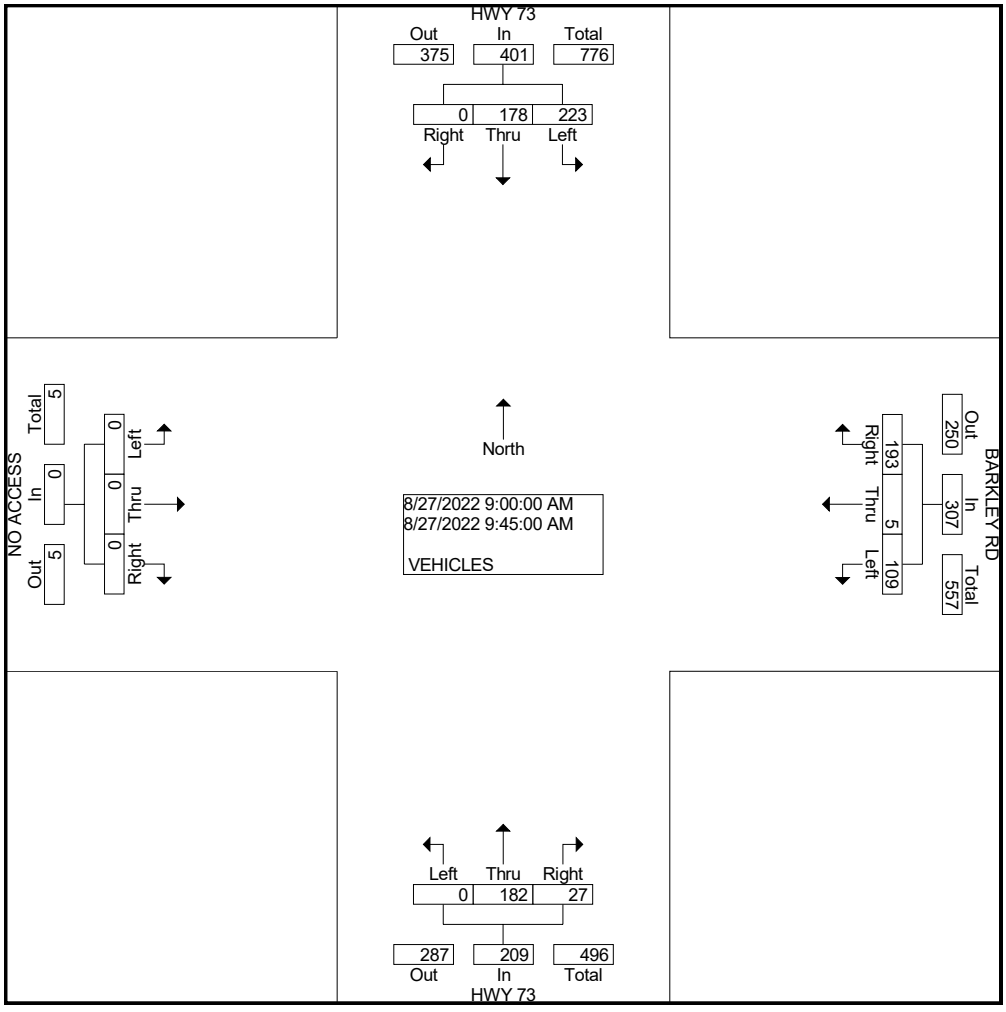
	HWY 73 Southbound			BARKLEY RD Westbound			HWY 73 Northbound			NO ACCESS Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
08:00 AM	41	22	0	5	0	28	0	24	2	0	0	0	122
08:15 AM	40	26	0	5	0	30	0	37	3	0	0	0	141
08:30 AM	30	36	0	19	1	42	0	30	9	0	0	0	167
08:45 AM	63	35	0	14	1	36	0	39	16	0	0	0	204
Total	174	119	0	43	2	136	0	130	30	0	0	0	634
09:00 AM	44	25	0	8	0	34	0	31	7	0	0	0	149
09:15 AM	62	41	0	31	0	55	0	45	4	0	0	0	238
09:30 AM	55	48	0	24	1	53	0	54	10	0	0	0	245
09:45 AM	62	64	0	46	4	51	0	52	6	0	0	0	285
Total	223	178	0	109	5	193	0	182	27	0	0	0	917
12:00 PM	67	44	0	21	0	58	0	63	17	0	0	0	270
12:15 PM	71	44	0	15	0	75	0	54	7	0	0	0	266
12:30 PM	241	52	0	5	0	56	0	48	25	0	0	0	427
12:45 PM	88	48	0	17	0	82	0	66	39	0	0	0	340
Total	467	188	0	58	0	271	0	231	88	0	0	0	1303
01:00 PM	70	60	0	18	1	59	0	43	18	0	0	0	269
01:15 PM	63	60	0	4	0	70	0	51	10	0	0	0	258
01:30 PM	75	43	0	7	0	73	0	52	12	0	0	0	262
01:45 PM	74	52	0	17	0	165	0	49	10	0	0	0	367
Total	282	215	0	46	1	367	0	195	50	0	0	0	1156
Grand Total	1146	700	0	256	8	967	0	738	195	0	0	0	4010
Apprch %	62.1	37.9	0.0	20.8	0.6	78.6	0.0	79.1	20.9	0.0	0.0	0.0	
Total %	28.6	17.5	0.0	6.4	0.2	24.1	0.0	18.4	4.9	0.0	0.0	0.0	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: HWY 73
E/W STREET: BARKLEY RD
CITY: CONIFER
COUNTY: JEFFERSON

File Name : HWY73BARK0827
Site Code : 00000013
Start Date : 8/27/2022
Page No : 2

	HWY 73 Southbound				BARKLEY RD Westbound				HWY 73 Northbound				NO ACCESS Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 08:00 AM to 09:45 AM - Peak 1 of 1																	
Intersection 09:00 AM																	
Volume	223	178	0	401	109	5	193	307	0	182	27	209	0	0	0	0	917
Percent	55.6	44.4	0.0		35.5	1.6	62.9		0.0	87.1	12.9		0.0	0.0	0.0		
09:45 Volume	62	64	0	126	46	4	51	101	0	52	6	58	0	0	0	0	285
Peak Factor																	0.804
High Int.	09:45 AM				09:45 AM				09:30 AM				7:45:00 AM				
Volume	62	64	0	126	46	4	51	101	0	54	10	64					
Peak Factor				0.796				0.760				0.816					

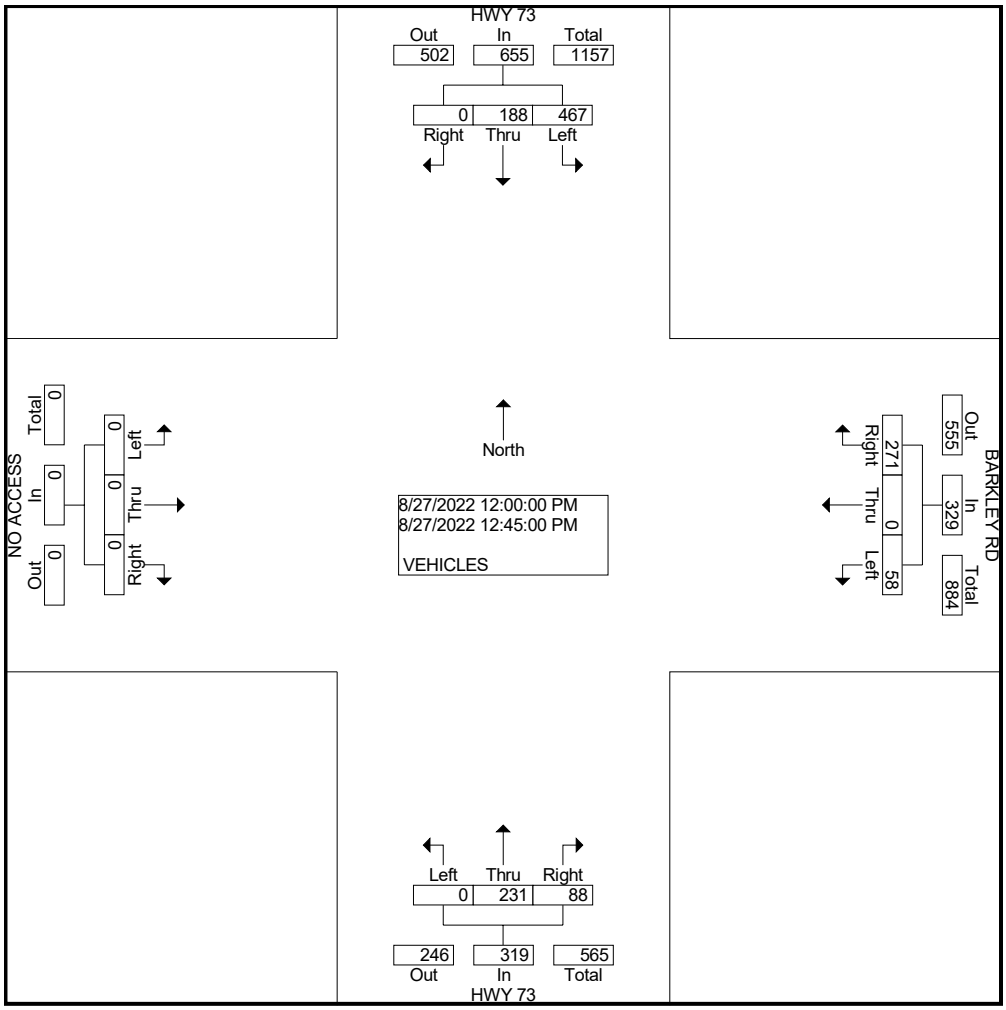


COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: HWY 73
E/W STREET: BARKLEY RD
CITY: CONIFER
COUNTY: JEFFERSON

File Name : HWY73BARK0827
Site Code : 00000013
Start Date : 8/27/2022
Page No : 3

	HWY 73 Southbound				BARKLEY RD Westbound				HWY 73 Northbound				NO ACCESS Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 12:00 PM to 01:45 PM - Peak 1 of 1																	
Intersection 12:00 PM																	
Volume	467	188	0	655	58	0	271	329	0	231	88	319	0	0	0	0	1303
Percent	71.3	28.7	0.0		17.6	0.0	82.4		0.0	72.4	27.6		0.0	0.0	0.0		
12:30 Volume	241	52	0	293	5	0	56	61	0	48	25	73	0	0	0	0	427
Peak Factor																	0.763
High Int.	12:30 PM				12:45 PM				12:45 PM								
Volume	241	52	0	293	17	0	82	99	0	66	39	105					
Peak Factor				0.559				0.831				0.760					



COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: HWY 73
E/W STREET: BARKLEY RD
CITY: CONIFER
COUNTY: JEFFERSON

File Name : HWY73BARK0828
Site Code : 00000013
Start Date : 8/28/2022
Page No : 1

Groups Printed- VEHICLES

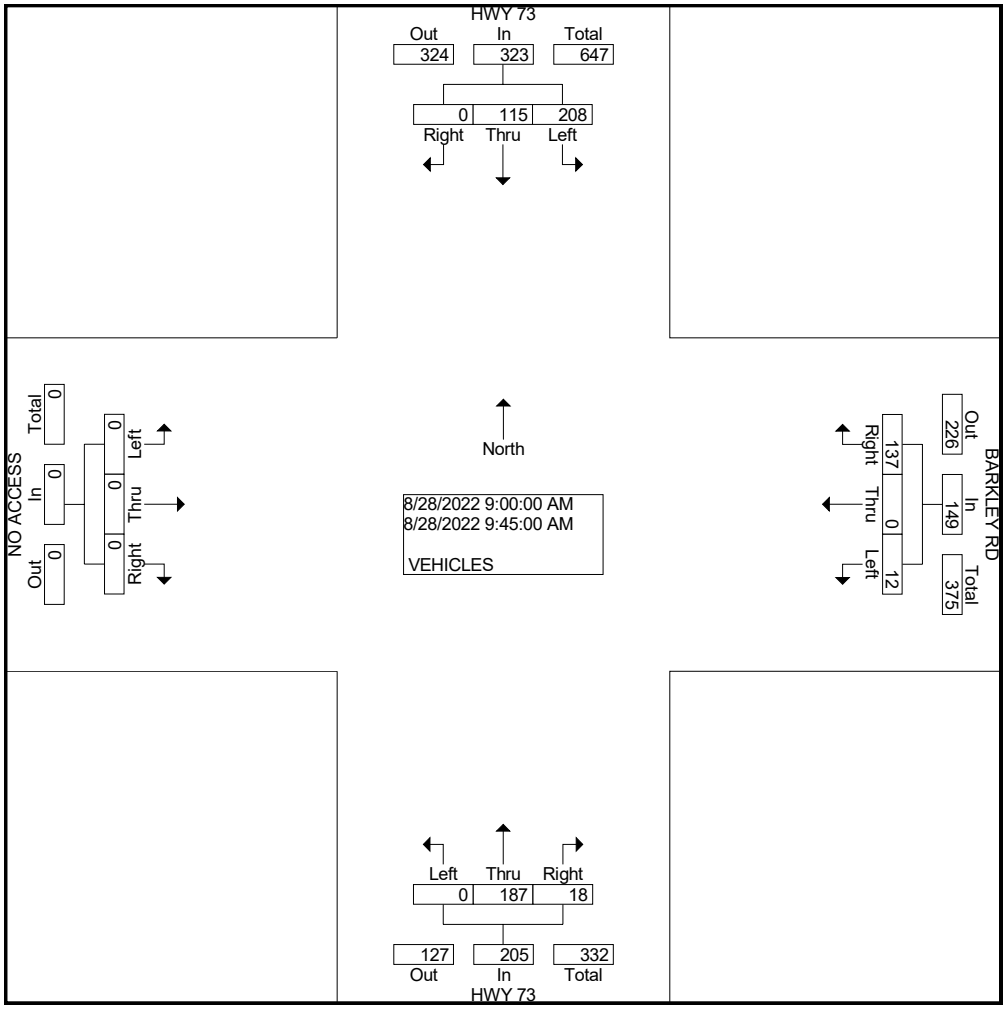
	HWY 73 Southbound			BARKLEY RD Westbound			HWY 73 Northbound			NO ACCESS Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
08:00 AM	37	18	0	0	0	25	0	19	4	0	0	0	103
08:15 AM	31	14	0	3	0	22	0	23	1	0	0	0	94
08:30 AM	31	25	0	1	0	29	0	26	6	0	0	0	118
08:45 AM	38	34	0	0	0	26	0	35	12	0	0	0	145
Total	137	91	0	4	0	102	0	103	23	0	0	0	460
09:00 AM	33	27	0	1	0	28	0	27	4	0	0	0	120
09:15 AM	74	23	0	1	0	36	0	36	4	0	0	0	174
09:30 AM	47	27	0	4	0	29	0	61	6	0	0	0	174
09:45 AM	54	38	0	6	0	44	0	63	4	0	0	0	209
Total	208	115	0	12	0	137	0	187	18	0	0	0	677
12:00 PM	52	59	0	12	0	62	0	48	10	0	0	0	243
12:15 PM	63	58	0	6	0	38	0	58	10	0	0	0	233
12:30 PM	53	51	0	7	0	59	0	57	10	0	0	0	237
12:45 PM	54	43	0	8	0	76	0	57	16	0	0	0	254
Total	222	211	0	33	0	235	0	220	46	0	0	0	967
01:00 PM	79	46	0	5	0	60	0	65	6	0	0	0	261
01:15 PM	56	53	0	4	1	53	0	56	17	0	0	0	240
01:30 PM	45	45	0	5	1	57	0	51	10	0	0	0	214
01:45 PM	52	41	0	0	0	52	0	45	12	0	0	0	202
Total	232	185	0	14	2	222	0	217	45	0	0	0	917
Grand Total	799	602	0	63	2	696	0	727	132	0	0	0	3021
Apprch %	57.0	43.0	0.0	8.3	0.3	91.5	0.0	84.6	15.4	0.0	0.0	0.0	
Total %	26.4	19.9	0.0	2.1	0.1	23.0	0.0	24.1	4.4	0.0	0.0	0.0	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: HWY 73
E/W STREET: BARKLEY RD
CITY: CONIFER
COUNTY: JEFFERSON

File Name : HWY73BARK0828
Site Code : 00000013
Start Date : 8/28/2022
Page No : 2

	HWY 73 Southbound				BARKLEY RD Westbound				HWY 73 Northbound				NO ACCESS Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 08:00 AM to 09:45 AM - Peak 1 of 1																	
Intersection 09:00 AM																	
Volume	208	115	0	323	12	0	137	149	0	187	18	205	0	0	0	0	677
Percent	64.4	35.6	0.0		8.1	0.0	91.9		0.0	91.2	8.8		0.0	0.0	0.0		
09:45 Volume	54	38	0	92	6	0	44	50	0	63	4	67	0	0	0	0	209
Peak Factor																	0.810
High Int.	09:15 AM				09:45 AM				09:30 AM				7:45:00 AM				
Volume	74	23	0	97	6	0	44	50	0	61	6	67					
Peak Factor				0.832				0.745				0.765					

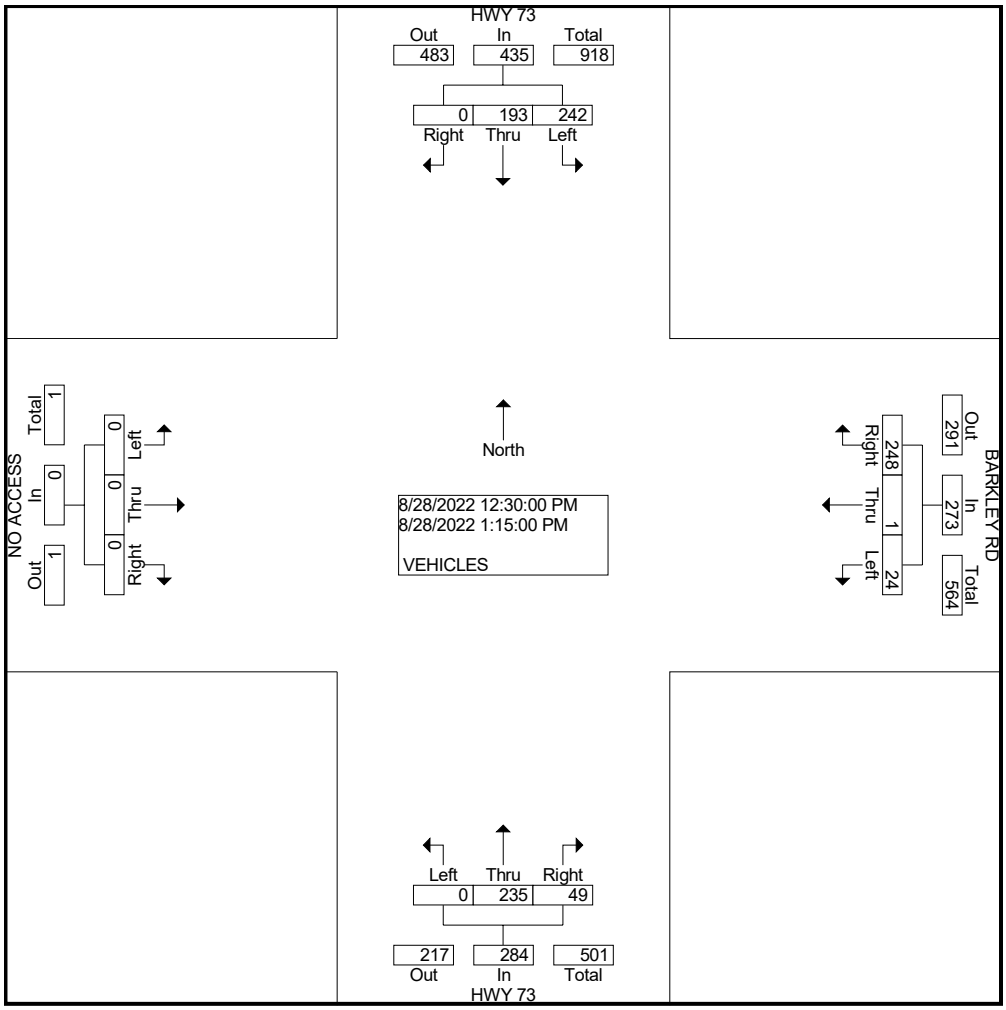


COUNTER MEASURES INC.
1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: HWY 73
E/W STREET: BARKLEY RD
CITY: CONIFER
COUNTY: JEFFERSON

File Name : HWY73BARK0828
Site Code : 00000013
Start Date : 8/28/2022
Page No : 3

	HWY 73 Southbound				BARKLEY RD Westbound				HWY 73 Northbound				NO ACCESS Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 12:00 PM to 01:45 PM - Peak 1 of 1																	
Intersection 12:30 PM																	
Volume	242	193	0	435	24	1	248	273	0	235	49	284	0	0	0	0	992
Percent	55.6	44.4	0.0		8.8	0.4	90.8		0.0	82.7	17.3		0.0	0.0	0.0		
01:00 Volume	79	46	0	125	5	0	60	65	0	65	6	71	0	0	0	0	261
Peak Factor																	0.950
High Int.	01:00 PM				12:45 PM				12:45 PM								
Volume	79	46	0	125	8	0	76	84	0	57	16	73					
Peak Factor				0.870				0.813				0.973					



COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: HWY 73
E/W STREET: SHADOW MOUNTAIN DR
CITY: CONIFER
COUNTY: JEFFERSON

File Name : HWY73SHADOW 0827
Site Code : 00000011
Start Date : 8/27/2022
Page No : 1

Groups Printed- VEHICLES

	HWY 73 Southbound			NO ACCESS Westbound			HWY 73 Northbound			SHADOW MTN DR Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
08:00 AM	0	37	1	0	0	0	10	40	0	6	0	20	114
08:15 AM	0	44	1	0	0	0	16	55	0	3	0	22	141
08:30 AM	0	43	2	0	0	0	16	60	0	6	0	32	159
08:45 AM	0	68	2	0	0	0	21	50	0	6	0	22	169
Total	0	192	6	0	0	0	63	205	0	21	0	96	583
09:00 AM	0	39	1	0	1	0	14	47	0	1	0	29	132
09:15 AM	0	71	4	0	0	0	23	81	0	5	0	30	214
09:30 AM	0	75	2	0	0	0	24	94	0	1	0	29	225
09:45 AM	0	84	2	0	0	0	26	72	0	5	0	32	221
Total	0	269	9	0	1	0	87	294	0	12	0	120	792
12:00 PM	0	78	3	0	0	0	30	89	0	6	0	29	235
12:15 PM	0	72	3	0	0	0	38	89	0	2	0	29	233
12:30 PM	0	218	3	0	0	0	31	83	0	6	0	24	365
12:45 PM	0	81	6	0	0	0	35	115	0	8	0	41	286
Total	0	449	15	0	0	0	134	376	0	22	0	123	1119
01:00 PM	0	99	4	0	0	0	33	71	0	5	0	34	246
01:15 PM	0	82	5	0	0	0	38	94	0	6	0	30	255
01:30 PM	0	89	7	0	0	0	30	88	0	4	0	32	250
01:45 PM	0	95	2	0	0	0	32	176	0	4	0	25	334
Total	0	365	18	0	0	0	133	429	0	19	0	121	1085
Grand Total	0	1275	48	0	1	0	417	1304	0	74	0	460	3579
Apprch %	0.0	96.4	3.6	0.0	100.0	0.0	24.2	75.8	0.0	13.9	0.0	86.1	
Total %	0.0	35.6	1.3	0.0	0.0	0.0	11.7	36.4	0.0	2.1	0.0	12.9	

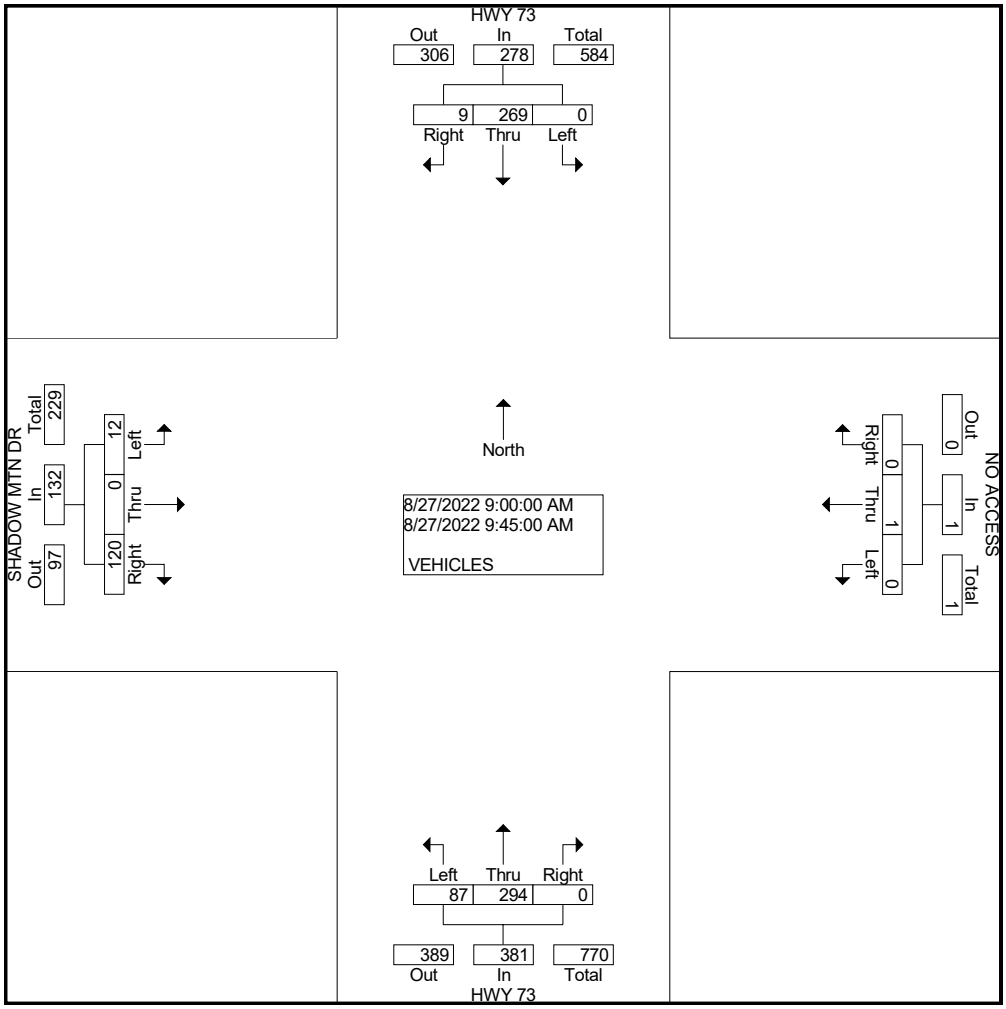
COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: HWY 73
E/W STREET: SHADOW MOUNTAIN DR
CITY: CONIFER
COUNTY: JEFFERSON

File Name : HWY73SHADOW 0827
Site Code : 00000011
Start Date : 8/27/2022
Page No : 2

	HWY 73 Southbound				NO ACCESS Westbound				HWY 73 Northbound				SHADOW MTN DR Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 09:00 AM to 09:45 AM - Peak 1 of 1																	
Intersection 09:00 AM																	
Volume	0	269	9	278	0	1	0	1	87	294	0	381	12	0	120	132	792
Percent	0.0	96.8	3.2		0.0	100.0	0.0		22.8	77.2	0.0		9.1	0.0	90.9		
09:30 Volume	0	75	2	77	0	0	0	0	24	94	0	118	1	0	29	30	225
Peak Factor																	0.880
High Int.	09:45 AM				09:00 AM				09:30 AM				09:45 AM				
Volume	0	84	2	86	0	1	0	1	24	94	0	118	5	0	32	37	
Peak Factor				0.808				0.250				0.807				0.892	



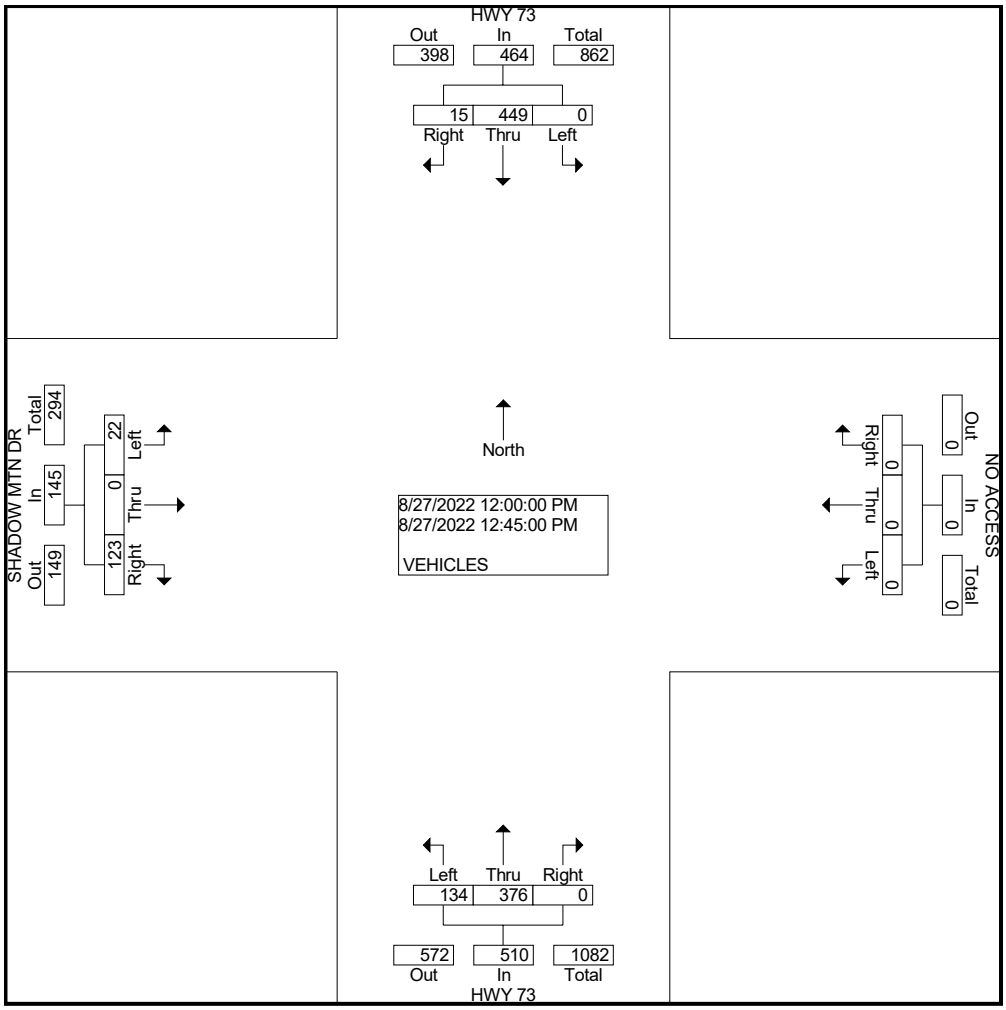
COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: HWY 73
E/W STREET: SHADOW MOUNTAIN DR
CITY: CONIFER
COUNTY: JEFFERSON

File Name : HWY73SHADOW 0827
Site Code : 00000011
Start Date : 8/27/2022
Page No : 3

	HWY 73 Southbound				NO ACCESS Westbound				HWY 73 Northbound				SHADOW MTN DR Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 12:00 PM to 12:45 PM - Peak 1 of 1																	
Intersection 12:00 PM																	
Volume	0	449	15	464	0	0	0	0	134	376	0	510	22	0	123	145	1119
Percent	0.0	96.8	3.2		0.0	0.0	0.0		26.3	73.7	0.0		15.2	0.0	84.8		
12:30 Volume	0	218	3	221	0	0	0	0	31	83	0	114	6	0	24	30	365
Peak Factor																	0.766
High Int. 12:30 PM									12:45 PM				12:45 PM				
Volume	0	218	3	221	0	0	0	0	35	115	0	150	8	0	41	49	
Peak Factor				0.525								0.850				0.740	



COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: HWY 73
E/W STREET: SHADOW MOUNTAIN DR
CITY: CONIFER
COUNTY: JEFFERSON

File Name : HWY73SHADOW0828
Site Code : 00000112
Start Date : 8/28/2022
Page No : 1

Groups Printed- VEHICLES

	HWY 73 Southbound			NO ACCESS Westbound			HWY 73 Northbound			SHADOW MTN DR Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
08:00 AM	0	34	0	0	0	0	10	33	0	1	0	16	94
08:15 AM	0	32	2	0	0	0	11	34	0	1	0	16	96
08:30 AM	0	44	2	0	0	0	10	44	0	1	0	15	116
08:45 AM	0	56	2	0	0	0	11	52	0	2	0	17	140
Total	0	166	6	0	0	0	42	163	0	5	0	64	446
09:00 AM	0	41	5	0	0	0	9	41	0	2	0	19	117
09:15 AM	0	68	2	0	0	0	23	53	0	5	0	28	179
09:30 AM	0	48	0	0	0	0	13	78	0	7	0	35	181
09:45 AM	0	61	4	0	0	0	15	81	0	10	0	30	201
Total	0	218	11	0	0	0	60	253	0	24	0	112	678
12:00 PM	0	83	3	0	0	0	18	88	0	2	0	23	217
12:15 PM	0	92	3	0	0	0	32	69	0	3	0	23	222
12:30 PM	0	71	1	0	1	0	32	85	0	1	0	27	218
12:45 PM	0	81	7	0	0	0	33	97	0	1	0	24	243
Total	0	327	14	0	1	0	115	339	0	7	0	97	900
01:00 PM	0	87	6	0	0	0	39	84	0	4	0	32	252
01:15 PM	0	76	4	0	0	0	27	88	0	6	0	25	226
01:30 PM	0	71	4	0	0	0	32	77	0	4	0	17	205
01:45 PM	0	74	6	0	0	0	26	72	0	5	0	21	204
Total	0	308	20	0	0	0	124	321	0	19	0	95	887
Grand Total	0	1019	51	0	1	0	341	1076	0	55	0	368	2911
Apprch %	0.0	95.2	4.8	0.0	100.0	0.0	24.1	75.9	0.0	13.0	0.0	87.0	
Total %	0.0	35.0	1.8	0.0	0.0	0.0	11.7	37.0	0.0	1.9	0.0	12.6	

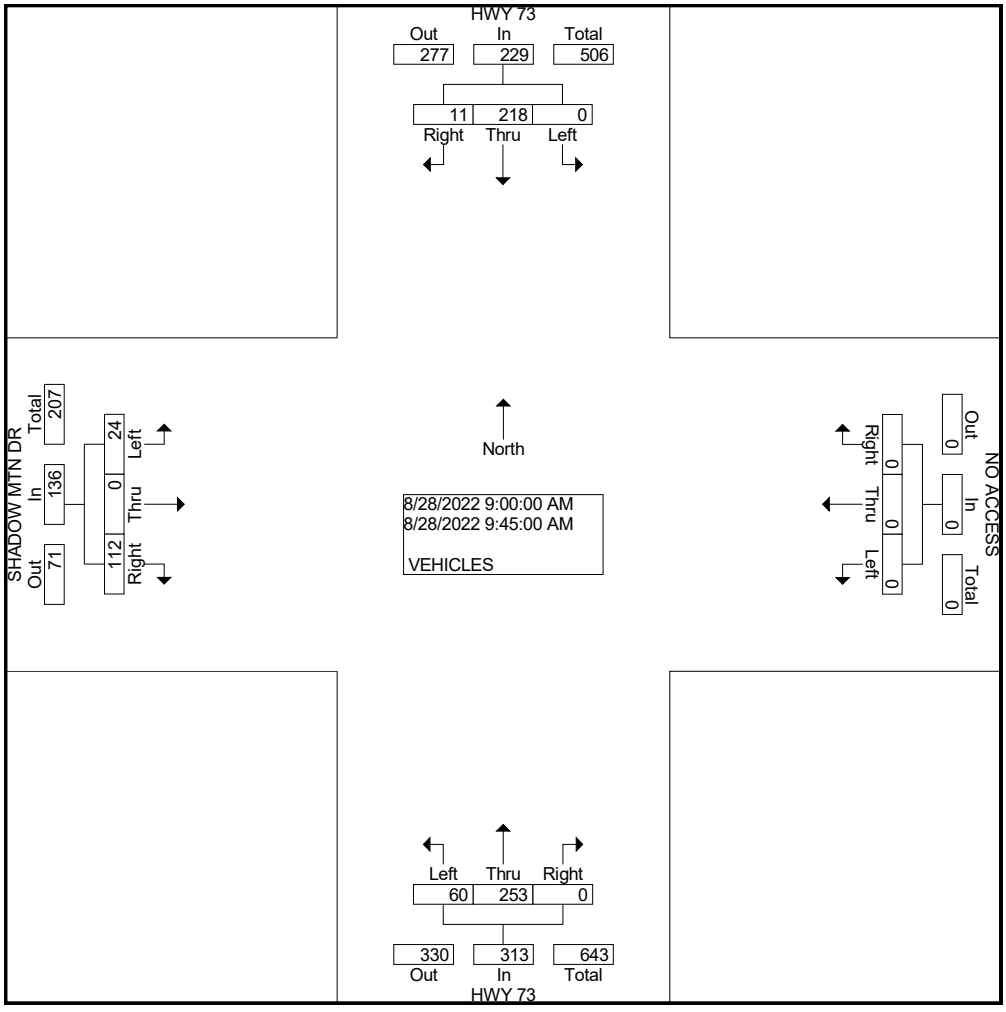
COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: HWY 73
E/W STREET: SHADOW MOUNTAIN DR
CITY: CONIFER
COUNTY: JEFFERSON

File Name : HWY73SHADOW0828
Site Code : 00000112
Start Date : 8/28/2022

	HWY 73 Southbound				NO ACCESS Westbound				HWY 73 Northbound				SHADOW MTN DR Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 09:00 AM to 09:45 AM - Peak 1 of 1																	
Intersection 09:00 AM																	
Volume	0	218	11	229	0	0	0	0	60	253	0	313	24	0	112	136	678
Percent	0.0	95.2	4.8		0.0	0.0	0.0		19.2	80.8	0.0		17.6	0.0	82.4		
09:45 Volume	0	61	4	65	0	0	0	0	15	81	0	96	10	0	30	40	201
Peak Factor																	0.843
High Int.	09:15 AM								09:45 AM				09:30 AM				
Volume	0	68	2	70	0	0	0	0	15	81	0	96	7	0	35	42	
Peak Factor				0.818								0.815				0.810	



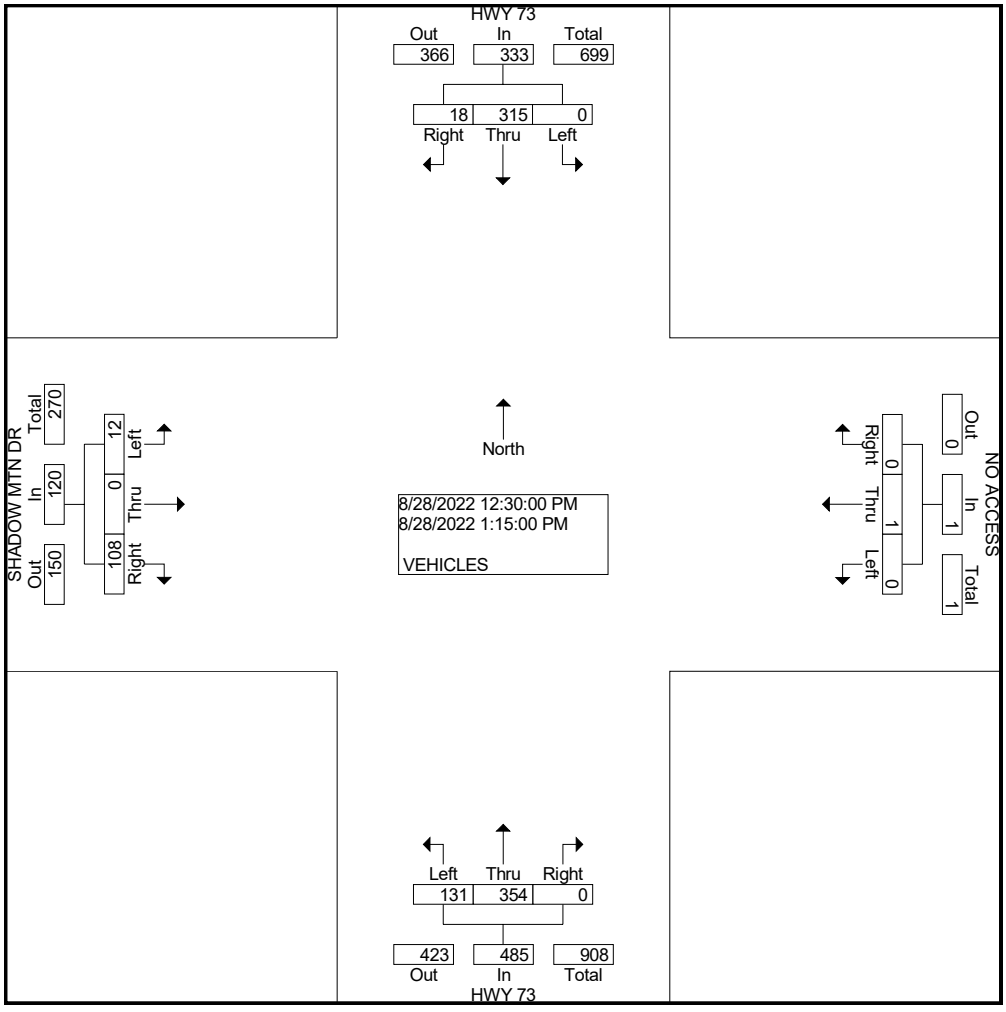
COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: HWY 73
E/W STREET: SHADOW MOUNTAIN DR
CITY: CONIFER
COUNTY: JEFFERSON

File Name : HWY73SHADOW0828
Site Code : 00000112
Start Date : 8/28/2022
Page No : 3

	HWY 73 Southbound				NO ACCESS Westbound				HWY 73 Northbound				SHADOW MTN DR Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 12:30 PM to 01:15 PM - Peak 1 of 1																	
Intersection 12:30 PM																	
Volume	0	315	18	333	0	1	0	1	131	354	0	485	12	0	108	120	939
Percent	0.0	94.6	5.4		0.0	100.0	0.0		27.0	73.0	0.0		10.0	0.0	90.0		
01:00 Volume	0	87	6	93	0	0	0	0	39	84	0	123	4	0	32	36	252
Peak Factor																	0.932
High Int.	01:00 PM				12:30 PM				12:45 PM				01:00 PM				
Volume	0	87	6	93	0	1	0	1	33	97	0	130	4	0	32	36	
Peak Factor				0.895				0.250				0.933				0.833	



COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: HWY 73 N-O BARKLEY RD
City: CONIFER
County: JEFFERSON
Direction: NORTH/SOUTH

Site Code: 222208
Station ID: 222208

Start Time	22-Aug-22 Mon	NORTH	SOUTH							Total
12:00 AM		*	*							*
01:00		*	*							*
02:00		*	*							*
03:00		*	*							*
04:00		*	*							*
05:00		*	*							*
06:00		*	*							*
07:00		*	*							*
08:00		*	*							*
09:00		*	*							*
10:00		*	*							*
11:00		*	*							*
12:00 PM		*	*							*
01:00		*	*							*
02:00		488	370							858
03:00		**545**	345							**890**
04:00		501	381							882
05:00		454	**429**							883
06:00		260	378							638
07:00		159	190							349
08:00		127	135							262
09:00		43	78							121
10:00		29	30							59
11:00		10	21							31
Total		2616	2357							4973
Percent		52.6%	47.4%							
AM Peak	-	-	-	-	-	-	-	-	-	-
Vol.	-	-	-	-	-	-	-	-	-	-
PM Peak	-	15:00	17:00	-	-	-	-	-	-	15:00
Vol.	-	545	429	-	-	-	-	-	-	890

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: HWY 73 N-O BARKLEY RD
City: CONIFER
County: JEFFERSON
Direction: NORTH/SOUTH

Site Code: 222208
Station ID: 222208

Start Time	23-Aug-22 Tue	NORTH	SOUTH							Total
12:00 AM		10	10							20
01:00		6	6							12
02:00		6	1							7
03:00		5	5							10
04:00		40	12							52
05:00		88	42							130
06:00		237	118							355
07:00		**552**	**389**							**941**
08:00		391	371							762
09:00		375	304							679
10:00		390	273							663
11:00		445	312							757
12:00 PM		441	278							719
01:00		503	244							747
02:00		547	298							845
03:00		**599**	356							955
04:00		581	359							940
05:00		549	**424**							**973**
06:00		365	335							700
07:00		244	239							483
08:00		148	206							354
09:00		73	97							170
10:00		15	51							66
11:00		16	36							52
Total		6626	4766							11392
Percent		58.2%	41.8%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	552	389	-	-	-	-	-	-	941
PM Peak	-	15:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	599	424	-	-	-	-	-	-	973

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: HWY 73 N-O BARKLEY RD
City: CONIFER
County: JEFFERSON
Direction: NORTH/SOUTH

Site Code: 222208
Station ID: 222208

Start Time	24-Aug-22 Wed	NORTH	SOUTH							Total
12:00 AM		9	12							21
01:00		5	6							11
02:00		2	6							8
03:00		6	10							16
04:00		30	15							45
05:00		94	43							137
06:00		227	139							366
07:00		**489**	356							845
08:00		453	**398**							**851**
09:00		407	317							724
10:00		400	224							624
11:00		461	275							736
12:00 PM		440	332							772
01:00		395	311							706
02:00		442	420							862
03:00		**557**	399							956
04:00		555	412							967
05:00		556	**451**							**1007**
06:00		314	341							655
07:00		176	271							447
08:00		147	175							322
09:00		87	101							188
10:00		28	49							77
11:00		15	20							35
Total		6295	5083							11378
Percent		55.3%	44.7%							
AM Peak	-	07:00	08:00	-	-	-	-	-	-	08:00
Vol.	-	489	398	-	-	-	-	-	-	851
PM Peak	-	15:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	557	451	-	-	-	-	-	-	1007

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: HWY 73 N-O BARKLEY RD
City: CONIFER
County: JEFFERSON
Direction: NORTH/SOUTH

Site Code: 222208
Station ID: 222208

Start Time	25-Aug-22 Thu	NORTH	SOUTH							Total
12:00 AM		8	11							19
01:00		5	6							11
02:00		8	6							14
03:00		12	4							16
04:00		24	19							43
05:00		93	42							135
06:00		233	127							360
07:00		**561**	**375**							**936**
08:00		387	370							757
09:00		445	341							786
10:00		393	261							654
11:00		420	328							748
12:00 PM		452	367							819
01:00		397	338							735
02:00		429	425							854
03:00		**532**	446							**978**
04:00		421	431							852
05:00		449	**475**							924
06:00		278	300							578
07:00		186	223							409
08:00		126	144							270
09:00		68	94							162
10:00		36	46							82
11:00		18	46							64
Total		5981	5225							11206
Percent		53.4%	46.6%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	561	375	-	-	-	-	-	-	936
PM Peak	-	15:00	17:00	-	-	-	-	-	-	15:00
Vol.	-	532	475	-	-	-	-	-	-	978

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: HWY 73 N-O BARKLEY RD
City: CONIFER
County: JEFFERSON
Direction: NORTH/SOUTH

Site Code: 222208
Station ID: 222208

Start Time	26-Aug-22 Fri	NORTH	SOUTH							Total
12:00 AM		5	21							26
01:00		7	2							9
02:00		7	11							18
03:00		7	6							13
04:00		35	15							50
05:00		87	37							124
06:00		214	126							340
07:00		**495**	333							**828**
08:00		398	323							721
09:00		378	**395**							773
10:00		437	326							763
11:00		484	338							822
12:00 PM		**539**	304							843
01:00		456	365							821
02:00		521	432							953
03:00		510	**505**							**1015**
04:00		457	389							846
05:00		438	407							845
06:00		287	310							597
07:00		205	242							447
08:00		114	153							267
09:00		78	110							188
10:00		47	54							101
11:00		28	31							59
Total		6234	5235							11469
Percent		54.4%	45.6%							
AM Peak	-	07:00	09:00	-	-	-	-	-	-	07:00
Vol.	-	495	395	-	-	-	-	-	-	828
PM Peak	-	12:00	15:00	-	-	-	-	-	-	15:00
Vol.	-	539	505	-	-	-	-	-	-	1015

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: HWY 73 N-O BARKLEY RD
City: CONIFER
County: JEFFERSON
Direction: NORTH/SOUTH

Site Code: 222208
Station ID: 222208

Start Time	27-Aug-22 Sat	NORTH	SOUTH							Total
12:00 AM		11	27							38
01:00		12	6							18
02:00		12	8							20
03:00		13	2							15
04:00		14	11							25
05:00		44	33							77
06:00		89	57							146
07:00		232	141							373
08:00		294	256							550
09:00		417	359							776
10:00		493	351							844
11:00		**522**	**378**							**900**
12:00 PM		503	457							960
01:00		**545**	**458**							**1003**
02:00		483	412							895
03:00		475	330							805
04:00		411	358							769
05:00		336	316							652
06:00		269	256							525
07:00		186	207							393
08:00		133	150							283
09:00		76	101							177
10:00		46	76							122
11:00		43	48							91
Total		5659	4798							10457
Percent		54.1%	45.9%							
AM Peak	-	11:00	11:00	-	-	-	-	-	-	11:00
Vol.	-	522	378	-	-	-	-	-	-	900
PM Peak	-	13:00	13:00	-	-	-	-	-	-	13:00
Vol.	-	545	458	-	-	-	-	-	-	1003

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: HWY 73 N-O BARKLEY RD
City: CONIFER
County: JEFFERSON
Direction: NORTH/SOUTH

Site Code: 222208
Station ID: 222208

Start Time	28-Aug-22 Sun	NORTH	SOUTH							Total
12:00 AM		22	30							52
01:00		18	4							22
02:00		11	5							16
03:00		7	3							10
04:00		10	13							23
05:00		27	16							43
06:00		62	40							102
07:00		139	113							252
08:00		238	199							437
09:00		335	312							647
10:00		418	346							764
11:00		**481**	**360**							**841**
12:00 PM		**469**	395							**864**
01:00		437	**424**							861
02:00		41	39							80
03:00		*	*							*
04:00		*	*							*
05:00		*	*							*
06:00		*	*							*
07:00		*	*							*
08:00		*	*							*
09:00		*	*							*
10:00		*	*							*
11:00		*	*							*
Total		2715	2299							5014
Percent		54.1%	45.9%							
AM Peak	-	11:00	11:00	-	-	-	-	-	-	11:00
Vol.	-	481	360	-	-	-	-	-	-	841
PM Peak	-	12:00	13:00	-	-	-	-	-	-	12:00
Vol.	-	469	424	-	-	-	-	-	-	864
Grand Total		36126	29763							65889
Percent		54.8%	45.2%							
ADT		ADT 9,827		AADT 9,827						

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location:SHADOW MTN DR E-O S. WARHAWK RD 1
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 22220
Station ID: 22220

Start Time	22-Aug-22 Mon	EAST	WEST							Total
12:00 AM		*	*							*
01:00		*	*							*
02:00		*	*							*
03:00		*	*							*
04:00		*	*							*
05:00		*	*							*
06:00		*	*							*
07:00		*	*							*
08:00		*	*							*
09:00		*	*							*
10:00		*	*							*
11:00		*	*							*
12:00 PM		61	76							137
01:00		82	78							160
02:00		61	73							134
03:00		**92**	110							**202**
04:00		85	108							193
05:00		62	**125**							187
06:00		48	116							164
07:00		18	60							78
08:00		11	51							62
09:00		6	30							36
10:00		4	11							15
11:00		2	17							19
Total		532	855							1387
Percent		38.4%	61.6%							
AM Peak	-	-	-	-	-	-	-	-	-	-
Vol.	-	-	-	-	-	-	-	-	-	-
PM Peak	-	15:00	17:00	-	-	-	-	-	-	15:00
Vol.	-	92	125	-	-	-	-	-	-	202

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location:SHADOW MTN DR E-O S. WARHAWK RD 1
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 22220
Station ID: 22220

Start Time	23-Aug-22 Tue	EAST	WEST							Total
12:00 AM		1	3							4
01:00		2	0							2
02:00		1	1							2
03:00		3	0							3
04:00		22	0							22
05:00		38	0							38
06:00		100	8							108
07:00		**150**	53							**203**
08:00		123	49							172
09:00		65	63							128
10:00		82	64							146
11:00		77	**73**							150
12:00 PM		84	79							163
01:00		70	72							142
02:00		79	86							165
03:00		**97**	104							201
04:00		78	113							191
05:00		82	**132**							**214**
06:00		43	110							153
07:00		25	69							94
08:00		20	54							74
09:00		4	30							34
10:00		2	23							25
11:00		4	15							19
Total		1252	1201							2453
Percent		51.0%	49.0%							
AM Peak	-	07:00	11:00	-	-	-	-	-	-	07:00
Vol.	-	150	73	-	-	-	-	-	-	203
PM Peak	-	15:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	97	132	-	-	-	-	-	-	214

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location:SHADOW MTN DR E-O S. WARHAWK RD 1
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 22220
Station ID: 22220

Start Time	24-Aug-22 Wed	EAST	WEST							Total
12:00 AM		1	8							9
01:00		2	1							3
02:00		0	2							2
03:00		3	1							4
04:00		21	1							22
05:00		38	2							40
06:00		79	15							94
07:00		**151**	55							**206**
08:00		133	59							192
09:00		80	**67**							147
10:00		77	43							120
11:00		92	65							157
12:00 PM		80	76							156
01:00		78	82							160
02:00		82	83							165
03:00		**117**	118							**235**
04:00		99	**124**							223
05:00		74	112							186
06:00		45	123							168
07:00		24	86							110
08:00		12	54							66
09:00		4	27							31
10:00		3	19							22
11:00		1	6							7
Total		1296	1229							2525
Percent		51.3%	48.7%							
AM Peak	-	07:00	09:00	-	-	-	-	-	-	07:00
Vol.	-	151	67	-	-	-	-	-	-	206
PM Peak	-	15:00	16:00	-	-	-	-	-	-	15:00
Vol.	-	117	124	-	-	-	-	-	-	235

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location:SHADOW MTN DR E-O S. WARHAWK RD 1
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 22220
Station ID: 22220

Start Time	25-Aug-22 Thu	EAST	WEST							Total
12:00 AM		1	8							9
01:00		0	4							4
02:00		1	1							2
03:00		1	0							1
04:00		16	1							17
05:00		38	1							39
06:00		88	8							96
07:00		**149**	47							196
08:00		141	66							**207**
09:00		97	62							159
10:00		82	54							136
11:00		67	**76**							143
12:00 PM		71	86							157
01:00		84	72							156
02:00		89	62							151
03:00		74	108							182
04:00		**90**	114							**204**
05:00		57	**136**							193
06:00		38	88							126
07:00		17	64							81
08:00		12	53							65
09:00		8	33							41
10:00		4	18							22
11:00		1	15							16
Total		1226	1177							2403
Percent		51.0%	49.0%							
AM Peak	-	07:00	11:00	-	-	-	-	-	-	08:00
Vol.	-	149	76	-	-	-	-	-	-	207
PM Peak	-	16:00	17:00	-	-	-	-	-	-	16:00
Vol.	-	90	136	-	-	-	-	-	-	204

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location:SHADOW MTN DR E-O S. WARHAWK RD 1
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 22220
Station ID: 22220

Start Time	26-Aug-22 Fri	EAST	WEST							Total
12:00 AM		0	7							7
01:00		2	2							4
02:00		2	1							3
03:00		1	2							3
04:00		19	0							19
05:00		35	1							36
06:00		68	9							77
07:00		**130**	45							**175**
08:00		114	42							156
09:00		89	61							150
10:00		90	**69**							159
11:00		88	69							157
12:00 PM		86	89							175
01:00		74	64							138
02:00		68	72							140
03:00		76	95							171
04:00		**89**	111							**200**
05:00		80	**116**							196
06:00		54	92							146
07:00		32	76							108
08:00		14	46							60
09:00		8	32							40
10:00		10	20							30
11:00		2	12							14
Total		1231	1133							2364
Percent		52.1%	47.9%							
AM Peak	-	07:00	10:00	-	-	-	-	-	-	07:00
Vol.	-	130	69	-	-	-	-	-	-	175
PM Peak	-	16:00	17:00	-	-	-	-	-	-	16:00
Vol.	-	89	116	-	-	-	-	-	-	200

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location:SHADOW MTN DR E-O S. WARHAWK RD 1
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 22220
Station ID: 22220

Start Time	27-Aug-22 Sat	EAST	WEST							Total
12:00 AM		3	10							13
01:00		0	5							5
02:00		4	3							7
03:00		4	0							4
04:00		10	0							10
05:00		9	1							10
06:00		37	9							46
07:00		70	19							89
08:00		88	48							136
09:00		89	62							151
10:00		**119**	**84**							**203**
11:00		105	80							185
12:00 PM		**104**	99							203
01:00		100	**105**							**205**
02:00		80	104							184
03:00		92	104							196
04:00		76	77							153
05:00		73	68							141
06:00		51	66							117
07:00		53	54							107
08:00		27	43							70
09:00		10	29							39
10:00		9	18							27
11:00		3	20							23
Total		1216	1108							2324
Percent		52.3%	47.7%							
AM Peak	-	10:00	10:00	-	-	-	-	-	-	10:00
Vol.	-	119	84	-	-	-	-	-	-	203
PM Peak	-	12:00	13:00	-	-	-	-	-	-	13:00
Vol.	-	104	105	-	-	-	-	-	-	205

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location:SHADOW MTN DR E-O S. WARHAWK RD 1
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 22220
Station ID: 22220

Start Time	28-Aug-22 Sun	EAST	WEST							Total
12:00 AM		1	10							11
01:00		3	4							7
02:00		0	1							1
03:00		1	1							2
04:00		5	2							7
05:00		11	1							12
06:00		17	6							23
07:00		46	17							63
08:00		57	34							91
09:00		**107**	49							156
10:00		84	72							156
11:00		96	**88**							**184**
12:00 PM		**100**	76							176
01:00		91	**101**							**192**
02:00		52	41							93
03:00		*	*							*
04:00		*	*							*
05:00		*	*							*
06:00		*	*							*
07:00		*	*							*
08:00		*	*							*
09:00		*	*							*
10:00		*	*							*
11:00		*	*							*
Total		671	503							1174
Percent		57.2%	42.8%							
AM Peak	-	09:00	11:00	-	-	-	-	-	-	11:00
Vol.	-	107	88	-	-	-	-	-	-	184
PM Peak	-	12:00	13:00	-	-	-	-	-	-	13:00
Vol.	-	100	101	-	-	-	-	-	-	192
Grand Total		7424	7206							14630
Percent		50.7%	49.3%							
ADT		ADT 2,137		AADT 2,137						

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR E-O SHADOW BROOK DR
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222214
Station ID: 222214

Start Time	22-Aug-22 Mon	EAST	WEST							Total
12:00 AM		*	*							*
01:00		*	*							*
02:00		*	*							*
03:00		*	*							*
04:00		*	*							*
05:00		*	*							*
06:00		*	*							*
07:00		*	*							*
08:00		*	*							*
09:00		*	*							*
10:00		*	*							*
11:00		*	*							*
12:00 PM		*	*							*
01:00		92	93							185
02:00		74	77							151
03:00		**105**	120							**225**
04:00		91	113							204
05:00		82	122							204
06:00		57	**129**							186
07:00		22	71							93
08:00		18	51							69
09:00		18	25							43
10:00		5	11							16
11:00		2	16							18
Total		566	828							1394
Percent		40.6%	59.4%							
AM Peak	-	-	-	-	-	-	-	-	-	-
Vol.	-	-	-	-	-	-	-	-	-	-
PM Peak	-	15:00	18:00	-	-	-	-	-	-	15:00
Vol.	-	105	129	-	-	-	-	-	-	225

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR E-O SHADOW BROOK DR
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222214
Station ID: 222214

Start Time	23-Aug-22 Tue	EAST	WEST							Total
12:00 AM		1	3							4
01:00		2	0							2
02:00		1	1							2
03:00		2	0							2
04:00		22	0							22
05:00		42	0							42
06:00		106	10							116
07:00		**164**	53							**217**
08:00		140	53							193
09:00		72	65							137
10:00		90	68							158
11:00		90	**73**							163
12:00 PM		87	86							173
01:00		76	78							154
02:00		82	88							170
03:00		**111**	118							229
04:00		95	120							215
05:00		94	**143**							**237**
06:00		43	120							163
07:00		35	74							109
08:00		20	66							86
09:00		6	38							44
10:00		3	19							22
11:00		4	14							18
Total		1388	1290							2678
Percent		51.8%	48.2%							
AM Peak	-	07:00	11:00	-	-	-	-	-	-	07:00
Vol.	-	164	73	-	-	-	-	-	-	217
PM Peak	-	15:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	111	143	-	-	-	-	-	-	237

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR E-O SHADOW BROOK DR
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222214
Station ID: 222214

Start Time	24-Aug-22 Wed	EAST	WEST							Total
12:00 AM		8	3							11
01:00		2	1							3
02:00		0	2							2
03:00		3	1							4
04:00		18	0							18
05:00		45	2							47
06:00		85	17							102
07:00		**158**	55							**213**
08:00		148	65							213
09:00		82	68							150
10:00		86	48							134
11:00		93	**77**							170
12:00 PM		87	83							170
01:00		84	93							177
02:00		87	101							188
03:00		**121**	129							**250**
04:00		90	**154**							244
05:00		85	123							208
06:00		60	124							184
07:00		25	100							125
08:00		19	49							68
09:00		7	33							40
10:00		4	20							24
11:00		1	6							7
Total		1398	1354							2752
Percent		50.8%	49.2%							
AM Peak	-	07:00	11:00	-	-	-	-	-	-	07:00
Vol.	-	158	77	-	-	-	-	-	-	213
PM Peak	-	15:00	16:00	-	-	-	-	-	-	15:00
Vol.	-	121	154	-	-	-	-	-	-	250

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR E-O SHADOW BROOK DR
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222214
Station ID: 222214

Start Time	25-Aug-22 Thu	EAST	WEST							Total
12:00 AM		3	8							11
01:00		0	4							4
02:00		1	1							2
03:00		2	1							3
04:00		16	0							16
05:00		39	2							41
06:00		88	12							100
07:00		161	54							215
08:00		**162**	68							**230**
09:00		103	71							174
10:00		85	57							142
11:00		74	**83**							157
12:00 PM		83	89							172
01:00		88	81							169
02:00		**95**	75							170
03:00		89	125							214
04:00		90	131							**221**
05:00		60	**150**							210
06:00		49	97							146
07:00		23	71							94
08:00		19	57							76
09:00		9	35							44
10:00		8	16							24
11:00		16	3							19
Total		1363	1291							2654
Percent		51.4%	48.6%							
AM Peak	-	08:00	11:00	-	-	-	-	-	-	08:00
Vol.	-	162	83	-	-	-	-	-	-	230
PM Peak	-	14:00	17:00	-	-	-	-	-	-	16:00
Vol.	-	95	150	-	-	-	-	-	-	221

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR E-O SHADOW BROOK DR
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222214
Station ID: 222214

Start Time	26-Aug-22 Fri	EAST	WEST							Total
12:00 AM		0	7							7
01:00		2	2							4
02:00		2	2							4
03:00		1	2							3
04:00		19	0							19
05:00		39	1							40
06:00		72	9							81
07:00		**138**	47							**185**
08:00		135	48							183
09:00		100	66							166
10:00		106	76							182
11:00		87	**82**							169
12:00 PM		**91**	96							187
01:00		85	74							159
02:00		78	82							160
03:00		90	109							199
04:00		90	128							**218**
05:00		76	**141**							217
06:00		53	101							154
07:00		45	82							127
08:00		14	46							60
09:00		9	39							48
10:00		17	19							36
11:00		4	15							19
Total		1353	1274							2627
Percent		51.5%	48.5%							
AM Peak	-	07:00	11:00	-	-	-	-	-	-	07:00
Vol.	-	138	82	-	-	-	-	-	-	185
PM Peak	-	12:00	17:00	-	-	-	-	-	-	16:00
Vol.	-	91	141	-	-	-	-	-	-	218

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR E-O SHADOW BROOK DR
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222214
Station ID: 222214

Start Time	27-Aug-22 Sat	EAST	WEST							Total
12:00 AM		2	10							12
01:00		9	0							9
02:00		8	0							8
03:00		4	0							4
04:00		10	0							10
05:00		10	1							11
06:00		39	9							48
07:00		71	21							92
08:00		92	54							146
09:00		101	65							166
10:00		**132**	90							**222**
11:00		111	**93**							204
12:00 PM		**103**	120							223
01:00		99	**127**							**226**
02:00		86	116							202
03:00		95	117							212
04:00		81	91							172
05:00		80	77							157
06:00		57	81							138
07:00		50	58							108
08:00		27	50							77
09:00		7	37							44
10:00		10	22							32
11:00		13	13							26
Total		1297	1252							2549
Percent		50.9%	49.1%							
AM Peak	-	10:00	11:00	-	-	-	-	-	-	10:00
Vol.	-	132	93	-	-	-	-	-	-	222
PM Peak	-	12:00	13:00	-	-	-	-	-	-	13:00
Vol.	-	103	127	-	-	-	-	-	-	226

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR E-O SHADOW BROOK DR
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222214
Station ID: 222214

Start Time	28-Aug-22 Sun	EAST	WEST							Total
12:00 AM		2	9							11
01:00		3	4							7
02:00		1	2							3
03:00		1	1							2
04:00		3	3							6
05:00		15	1							16
06:00		20	5							25
07:00		46	17							63
08:00		61	39							100
09:00		**113**	56							169
10:00		100	80							180
11:00		109	**89**							**198**
12:00 PM		**92**	104							196
01:00		88	**114**							**202**
02:00		38	37							75
03:00		*	*							*
04:00		*	*							*
05:00		*	*							*
06:00		*	*							*
07:00		*	*							*
08:00		*	*							*
09:00		*	*							*
10:00		*	*							*
11:00		*	*							*
Total		692	561							1253
Percent		55.2%	44.8%							
AM Peak	-	09:00	11:00	-	-	-	-	-	-	11:00
Vol.	-	113	89	-	-	-	-	-	-	198
PM Peak	-	12:00	13:00	-	-	-	-	-	-	13:00
Vol.	-	92	114	-	-	-	-	-	-	202
Grand Total		8057	7850							15907
Percent		50.7%	49.3%							
ADT		ADT 2,351		AADT 2,351						

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR W-O CONIFER DR
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222218
Station ID: 222218

Start Time	22-Aug-22 Mon	EAST	WEST							Total
12:00 AM		*	*							*
01:00		*	*							*
02:00		*	*							*
03:00		*	*							*
04:00		*	*							*
05:00		*	*							*
06:00		*	*							*
07:00		*	*							*
08:00		*	*							*
09:00		*	*							*
10:00		*	*							*
11:00		*	*							*
12:00 PM		*	*							*
01:00		84	138							222
02:00		95	100							195
03:00		129	138							**267**
04:00		109	**152**							261
05:00		122	130							252
06:00		**142**	86							228
07:00		78	32							110
08:00		65	18							83
09:00		38	7							45
10:00		13	7							20
11:00		17	2							19
Total		892	810							1702
Percent		52.4%	47.6%							
AM Peak	-	-	-	-	-	-	-	-	-	-
Vol.	-	-	-	-	-	-	-	-	-	-
PM Peak	-	18:00	16:00	-	-	-	-	-	-	15:00
Vol.	-	142	152	-	-	-	-	-	-	267

Location: SHADOW MTN DR W-O CONIFER DR
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Site Code: 222218
Station ID: 222218

Start Time	23-Aug-22 Tue	EAST	WEST							Total
12:00 AM		4	2							6
01:00		0	4							4
02:00		1	1							2
03:00		0	4							4
04:00		1	23							24
05:00		1	51							52
06:00		14	120							134
07:00		58	**189**							**247**
08:00		55	167							222
09:00		77	96							173
10:00		74	97							171
11:00		**104**	91							195
12:00 PM		100	103							203
01:00		104	72							176
02:00		117	87							204
03:00		158	104							262
04:00		147	110							257
05:00		**169**	**118**							**287**
06:00		123	92							215
07:00		92	36							128
08:00		81	22							103
09:00		34	17							51
10:00		24	3							27
11:00		18	4							22
Total		1556	1613							3169
Percent		49.1%	50.9%							
AM Peak	-	11:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	104	189	-	-	-	-	-	-	247
PM Peak	-	17:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	169	118	-	-	-	-	-	-	287

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR W-O CONIFER DR
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222218
Station ID: 222218

Start Time	24-Aug-22 Wed	EAST	WEST							Total
12:00 AM		7	5							12
01:00		1	3							4
02:00		2	0							2
03:00		1	4							5
04:00		0	20							20
05:00		3	52							55
06:00		21	99							120
07:00		61	**183**							244
08:00		70	180							**250**
09:00		76	104							180
10:00		57	101							158
11:00		**94**	95							189
12:00 PM		98	92							190
01:00		111	88							199
02:00		125	92							217
03:00		163	**132**							**295**
04:00		**173**	106							279
05:00		146	122							268
06:00		145	79							224
07:00		106	42							148
08:00		64	19							83
09:00		35	8							43
10:00		25	3							28
11:00		7	1							8
Total		1591	1630							3221
Percent		49.4%	50.6%							
AM Peak	-	11:00	07:00	-	-	-	-	-	-	08:00
Vol.	-	94	183	-	-	-	-	-	-	250
PM Peak	-	16:00	15:00	-	-	-	-	-	-	15:00
Vol.	-	173	132	-	-	-	-	-	-	295

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR W-O CONIFER DR
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222218
Station ID: 222218

Start Time	25-Aug-22 Thu	EAST	WEST							Total
12:00 AM		10	1							11
01:00		4	0							4
02:00		1	2							3
03:00		2	4							6
04:00		0	17							17
05:00		3	48							51
06:00		11	98							109
07:00		53	**192**							245
08:00		79	180							**259**
09:00		71	148							219
10:00		66	98							164
11:00		**99**	86							185
12:00 PM		112	91							203
01:00		89	111							200
02:00		86	106							192
03:00		138	**115**							253
04:00		151	103							254
05:00		**168**	90							**258**
06:00		117	56							173
07:00		92	30							122
08:00		73	18							91
09:00		41	13							54
10:00		24	4							28
11:00		19	1							20
Total		1509	1612							3121
Percent		48.3%	51.7%							
AM Peak	-	11:00	07:00	-	-	-	-	-	-	08:00
Vol.	-	99	192	-	-	-	-	-	-	259
PM Peak	-	17:00	15:00	-	-	-	-	-	-	17:00
Vol.	-	168	115	-	-	-	-	-	-	258

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR W-O CONIFER DR
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222218
Station ID: 222218

Start Time	26-Aug-22 Fri	EAST	WEST							Total
12:00 AM		8	0							8
01:00		2	2							4
02:00		3	3							6
03:00		0	4							4
04:00		0	21							21
05:00		2	45							47
06:00		7	84							91
07:00		52	**166**							218
08:00		58	165							223
09:00		85	107							192
10:00		85	144							**229**
11:00		**102**	100							202
12:00 PM		121	99							220
01:00		91	89							180
02:00		94	113							207
03:00		120	**131**							251
04:00		150	99							249
05:00		**161**	97							**258**
06:00		111	62							173
07:00		102	48							150
08:00		54	19							73
09:00		46	10							56
10:00		29	13							42
11:00		17	4							21
Total		1500	1625							3125
Percent		48.0%	52.0%							
AM Peak	-	11:00	07:00	-	-	-	-	-	-	10:00
Vol.	-	102	166	-	-	-	-	-	-	229
PM Peak	-	17:00	15:00	-	-	-	-	-	-	17:00
Vol.	-	161	131	-	-	-	-	-	-	258

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR W-O CONIFER DR
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222218
Station ID: 222218

Start Time	27-Aug-22 Sat	EAST	WEST							Total
12:00 AM		14	2							16
01:00		7	1							8
02:00		3	5							8
03:00		0	5							5
04:00		0	10							10
05:00		2	10							12
06:00		10	40							50
07:00		22	82							104
08:00		58	115							173
09:00		74	132							206
10:00		**111**	**135**							**246**
11:00		111	124							235
12:00 PM		140	**120**							260
01:00		**153**	108							**261**
02:00		144	91							235
03:00		145	94							239
04:00		105	90							195
05:00		80	118							198
06:00		93	80							173
07:00		70	56							126
08:00		63	28							91
09:00		43	10							53
10:00		25	12							37
11:00		12	16							28
Total		1485	1484							2969
Percent		50.0%	50.0%							
AM Peak	-	10:00	10:00	-	-	-	-	-	-	10:00
Vol.	-	111	135	-	-	-	-	-	-	246
PM Peak	-	13:00	12:00	-	-	-	-	-	-	13:00
Vol.	-	153	120	-	-	-	-	-	-	261

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR W-O CONIFER DR
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222218
Station ID: 222218

Start Time	28-Aug-22 Sun	EAST	WEST							Total
12:00 AM		12	3							15
01:00		4	4							8
02:00		2	1							3
03:00		1	2							3
04:00		3	4							7
05:00		2	15							17
06:00		6	21							27
07:00		20	54							74
08:00		39	65							104
09:00		61	**138**							199
10:00		105	109							214
11:00		**118**	117							**235**
12:00 PM		**123**	101							224
01:00		98	**156**							**254**
02:00		68	78							146
03:00		1	0							1
04:00		0	0							0
05:00		*	*							*
06:00		*	*							*
07:00		*	*							*
08:00		*	*							*
09:00		*	*							*
10:00		*	*							*
11:00		*	*							*
Total		663	868							1531
Percent		43.3%	56.7%							
AM Peak	-	11:00	09:00	-	-	-	-	-	-	11:00
Vol.	-	118	138	-	-	-	-	-	-	235
PM Peak	-	12:00	13:00	-	-	-	-	-	-	13:00
Vol.	-	123	156	-	-	-	-	-	-	254
Grand Total		9196	9642							18838
Percent		48.8%	51.2%							
ADT		ADT 2,776		AADT 2,776						

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR W-O HWY 73
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222207
Station ID: 222207

Start Time	22-Aug-22 Mon	EAST	WEST							Total
12:00 AM		*	*							*
01:00		*	*							*
02:00		*	*							*
03:00		*	*							*
04:00		*	*							*
05:00		*	*							*
06:00		*	*							*
07:00		*	*							*
08:00		*	*							*
09:00		*	*							*
10:00		*	*							*
11:00		*	*							*
12:00 PM		*	*							*
01:00		99	102							201
02:00		90	99							189
03:00		**110**	155							**265**
04:00		100	145							245
05:00		79	**162**							241
06:00		60	156							216
07:00		29	84							113
08:00		18	61							79
09:00		7	38							45
10:00		7	14							21
11:00		2	16							18
Total		601	1032							1633
Percent		36.8%	63.2%							
AM Peak	-	-	-	-	-	-	-	-	-	-
Vol.	-	-	-	-	-	-	-	-	-	-
PM Peak	-	15:00	17:00	-	-	-	-	-	-	15:00
Vol.	-	110	162	-	-	-	-	-	-	265

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR W-O HWY 73
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222207
Station ID: 222207

Start Time	23-Aug-22 Tue	EAST	WEST							Total
12:00 AM		2	4							6
01:00		4	0							4
02:00		1	1							2
03:00		4	0							4
04:00		23	1							24
05:00		51	1							52
06:00		122	16							138
07:00		**185**	66							**251**
08:00		169	63							232
09:00		84	78							162
10:00		93	82							175
11:00		102	**92**							194
12:00 PM		158	**60**							218
01:00		184	0							184
02:00		207	0							207
03:00		270	0							270
04:00		266	0							266
05:00		**290**	0							**290**
06:00		217	0							217
07:00		125	0							125
08:00		105	0							105
09:00		52	0							52
10:00		27	0							27
11:00		21	0							21
Total		2762	464							3226
Percent		85.6%	14.4%							
AM Peak	-	07:00	11:00	-	-	-	-	-	-	07:00
Vol.	-	185	92	-	-	-	-	-	-	251
PM Peak	-	17:00	12:00	-	-	-	-	-	-	17:00
Vol.	-	290	60	-	-	-	-	-	-	290

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR W-O HWY 73
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222207
Station ID: 222207

Start Time	24-Aug-22 Wed	EAST	WEST							Total
12:00 AM		12	0							12
01:00		4	0							4
02:00		3	0							3
03:00		5	0							5
04:00		20	0							20
05:00		55	0							55
06:00		121	0							121
07:00		253	0							253
08:00		**260**	0							**260**
09:00		180	0							180
10:00		157	0							157
11:00		196	0							196
12:00 PM		**191**	0							191
01:00		144	69							213
02:00		105	119							224
03:00		134	162							296
04:00		119	**178**							**297**
05:00		96	170							266
06:00		64	171							235
07:00		33	106							139
08:00		17	64							81
09:00		8	33							41
10:00		3	25							28
11:00		1	7							8
Total		2181	1104							3285
Percent		66.4%	33.6%							
AM Peak	-	08:00	-	-	-	-	-	-	-	08:00
Vol.	-	260	-	-	-	-	-	-	-	260
PM Peak	-	12:00	16:00	-	-	-	-	-	-	16:00
Vol.	-	191	178	-	-	-	-	-	-	297

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR W-O HWY 73
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222207
Station ID: 222207

Start Time	25-Aug-22 Thu	EAST	WEST							Total
12:00 AM		1	11							12
01:00		0	3							3
02:00		2	1							3
03:00		4	2							6
04:00		17	0							17
05:00		48	3							51
06:00		100	11							111
07:00		**180**	67							247
08:00		180	85							**265**
09:00		124	80							204
10:00		98	65							163
11:00		95	**98**							193
12:00 PM		94	115							209
01:00		96	96							192
02:00		108	94							202
03:00		**113**	144							257
04:00		103	158							**261**
05:00		80	**180**							260
06:00		60	122							182
07:00		30	95							125
08:00		16	76							92
09:00		12	41							53
10:00		4	24							28
11:00		1	20							21
Total		1566	1591							3157
Percent		49.6%	50.4%							
AM Peak	-	07:00	11:00	-	-	-	-	-	-	08:00
Vol.	-	180	98	-	-	-	-	-	-	265
PM Peak	-	15:00	17:00	-	-	-	-	-	-	16:00
Vol.	-	113	180	-	-	-	-	-	-	261

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR W-O HWY 73
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222207
Station ID: 222207

Start Time	26-Aug-22 Fri	EAST	WEST							Total
12:00 AM		0	7							7
01:00		2	3							5
02:00		3	2							5
03:00		2	2							4
04:00		22	0							22
05:00		45	3							48
06:00		87	7							94
07:00		166	59							225
08:00		**168**	63							**231**
09:00		102	84							186
10:00		130	88							218
11:00		107	**104**							211
12:00 PM		102	123							225
01:00		92	95							187
02:00		101	109							210
03:00		**118**	122							240
04:00		96	**167**							**263**
05:00		95	151							246
06:00		63	116							179
07:00		49	108							157
08:00		21	55							76
09:00		10	48							58
10:00		12	28							40
11:00		6	18							24
Total		1599	1562							3161
Percent		50.6%	49.4%							
AM Peak	-	08:00	11:00	-	-	-	-	-	-	08:00
Vol.	-	168	104	-	-	-	-	-	-	231
PM Peak	-	15:00	16:00	-	-	-	-	-	-	16:00
Vol.	-	118	167	-	-	-	-	-	-	263

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR W-O HWY 73
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222207
Station ID: 222207

Start Time	27-Aug-22 Sat	EAST	WEST							Total
12:00 AM		2	15							17
01:00		1	7							8
02:00		5	3							8
03:00		5	0							5
04:00		10	0							10
05:00		10	2							12
06:00		40	11							51
07:00		82	23							105
08:00		116	60							176
09:00		126	81							207
10:00		**151**	**108**							**259**
11:00		135	102							237
12:00 PM		**128**	142							**270**
01:00		115	**146**							261
02:00		99	146							245
03:00		108	141							249
04:00		95	107							202
05:00		95	101							196
06:00		65	93							158
07:00		54	69							123
08:00		28	62							90
09:00		8	44							52
10:00		8	26							34
11:00		7	23							30
Total		1493	1512							3005
Percent		49.7%	50.3%							
AM Peak	-	10:00	10:00	-	-	-	-	-	-	10:00
Vol.	-	151	108	-	-	-	-	-	-	259
PM Peak	-	12:00	13:00	-	-	-	-	-	-	12:00
Vol.	-	128	146	-	-	-	-	-	-	270

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Location: SHADOW MTN DR W-O HWY 73
City: CONIFER
County: JEFFERSON
Direction: EAST/WEST

Site Code: 222207
Station ID: 222207

Start Time	28-Aug-22 Sun	EAST	WEST							Total
12:00 AM		3	13							16
01:00		4	3							7
02:00		1	2							3
03:00		3	1							4
04:00		4	3							7
05:00		15	4							19
06:00		22	7							29
07:00		56	21							77
08:00		67	43							110
09:00		131	61							192
10:00		127	99							226
11:00		**132**	**107**							**239**
12:00 PM		102	126							228
01:00		**105**	**136**							**241**
02:00		26	30							56
03:00		*	*							*
04:00		*	*							*
05:00		*	*							*
06:00		*	*							*
07:00		*	*							*
08:00		*	*							*
09:00		*	*							*
10:00		*	*							*
11:00		*	*							*
Total		798	656							1454
Percent		54.9%	45.1%							
AM Peak	-	11:00	11:00	-	-	-	-	-	-	11:00
Vol.	-	132	107	-	-	-	-	-	-	239
PM Peak	-	13:00	13:00	-	-	-	-	-	-	13:00
Vol.	-	105	136	-	-	-	-	-	-	241
Grand Total		11000	7921							18921
Percent		58.1%	41.9%							
ADT		ADT 2,782		AADT 2,782						

LEVEL OF SERVICE DEFINITIONS

From *Highway Capacity Manual*, Transportation Research Board

UNSIGNALIZED INTERSECTION LEVEL OF SERVICE (LOS)

Applicable to Two-Way Stop Control, All-Way Stop Control, and Roundabouts

LOS	Average Vehicle Control Delay	Operational Characteristics
A	<10 seconds	Normally, vehicles on the stop-controlled approach only have to wait up to 10 seconds before being able to clear the intersection. Left-turning vehicles on the uncontrolled street do not have to wait to make their turn.
B	10 to 15 seconds	Vehicles on the stop-controlled approach will experience delays before being able to clear the intersection. The delay could be up to 15 seconds. Left-turning vehicles on the uncontrolled street may have to wait to make their turn.
C	15 to 25 seconds	Vehicles on the stop-controlled approach can expect delays in the range of 15 to 25 seconds before clearing the intersection. Motorists may begin to take chances due to the long delays, thereby posing a safety risk to through traffic. Left-turning vehicles on the uncontrolled street will now be required to wait to make their turn causing a queue to be created in the turn lane.
D	25 to 35 seconds	This is the point at which a traffic signal may be warranted for this intersection. The delays for the stop-controlled intersection are not considered to be excessive. The length of the queue may begin to block other public and private access points.
E	35 to 50 seconds	The delays for all critical traffic movements are considered to be unacceptable. The length of the queues for the stop-controlled approaches as well as the left-turn movements are extremely long. There is a high probability that this intersection will meet traffic signal warrants. The ability to install a traffic signal is affected by the location of other existing traffic signals. Consideration may be given to restricting the accesses by eliminating the left-turn movements from and to the stop-controlled approach.
F	>50 seconds	The delay for the critical traffic movements are probably in excess of 100 seconds. The length of the queues are extremely long. Motorists are selecting alternative routes due to the long delays. The only remedy for these long delays is installing a traffic signal or restricting the accesses. The potential for accidents at this intersection are extremely high due to motorist taking more risky chances. If the median permits, motorists begin making two-stage left-turns.

Intersection	
Int Delay, s/veh	3

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	433	16	183	310	8	100
Future Vol, veh/h	433	16	183	310	8	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	245	485	-	105	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	492	18	208	352	9	114

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	510	0	1260	492
Stage 1	-	-	-	-	492	-
Stage 2	-	-	-	-	768	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1055	-	188	577
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	458	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1055	-	151	577
Mov Cap-2 Maneuver	-	-	-	-	151	-
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	368	-

Approach	SE	NW	NE
HCM Control Delay, s	0	3.4	14.1
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	151	577	1055	-	-	-
HCM Lane V/C Ratio	0.06	0.197	0.197	-	-	-
HCM Control Delay (s)	30.4	12.8	9.2	-	-	-
HCM Lane LOS	D	B	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0.7	0.7	-	-	-

Intersection	
Int Delay, s/veh	12

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	274	276	177	78	114	315
Future Vol, veh/h	274	276	177	78	114	315
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	325	-	-	270	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	311	314	201	89	130	358

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	290	0	-	0	1137	201
Stage 1	-	-	-	-	201	-
Stage 2	-	-	-	-	936	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1272	-	-	-	223	840
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	382	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1272	-	-	-	169	840
Mov Cap-2 Maneuver	-	-	-	-	169	-
Stage 1	-	-	-	-	630	-
Stage 2	-	-	-	-	382	-

Approach	SE	NW	SW
HCM Control Delay, s	4.4	0	28.8
HCM LOS			D

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1272	-	169	840
HCM Lane V/C Ratio	-	-	0.245	-	0.767	0.426
HCM Control Delay (s)	-	-	8.7	-	74.3	12.4
HCM Lane LOS	-	-	A	-	F	B
HCM 95th %tile Q(veh)	-	-	1	-	4.9	2.2

Intersection	
Int Delay, s/veh	2.9

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	269	9	87	294	12	120
Future Vol, veh/h	269	9	87	294	12	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	245	485	-	105	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	306	10	99	334	14	136

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	316	0	838	306
Stage 1	-	-	-	-	306	-
Stage 2	-	-	-	-	532	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1244	-	336	734
Stage 1	-	-	-	-	747	-
Stage 2	-	-	-	-	589	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1244	-	309	734
Mov Cap-2 Maneuver	-	-	-	-	309	-
Stage 1	-	-	-	-	747	-
Stage 2	-	-	-	-	542	-

Approach	SE	NW	NE
HCM Control Delay, s	0	1.9	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	309	734	1244	-	-	-
HCM Lane V/C Ratio	0.044	0.186	0.079	-	-	-
HCM Control Delay (s)	17.2	11	8.1	-	-	-
HCM Lane LOS	C	B	A	-	-	-
HCM 95th %tile Q(veh)	0.1	0.7	0.3	-	-	-

Intersection	
Int Delay, s/veh	8.4

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	223	178	182	27	109	193
Future Vol, veh/h	223	178	182	27	109	193
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	325	-	-	270	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	253	202	207	31	124	219

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	238	0	-	0	915	207
Stage 1	-	-	-	-	207	-
Stage 2	-	-	-	-	708	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1329	-	-	-	303	833
Stage 1	-	-	-	-	828	-
Stage 2	-	-	-	-	488	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1329	-	-	-	245	833
Mov Cap-2 Maneuver	-	-	-	-	245	-
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	488	-

Approach	SE	NW	SW
HCM Control Delay, s	4.6	0	19.2
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1329	-	245	833
HCM Lane V/C Ratio	-	-	0.191	-	0.506	0.263
HCM Control Delay (s)	-	-	8.3	-	33.8	10.9
HCM Lane LOS	-	-	A	-	D	B
HCM 95th %tile Q(veh)	-	-	0.7	-	2.6	1.1

Intersection	
Int Delay, s/veh	3.2

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	449	15	134	376	22	123
Future Vol, veh/h	449	15	134	376	22	123
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	245	485	-	105	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	510	17	152	427	25	140

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	527	0	1241	510
Stage 1	-	-	-	-	510	-
Stage 2	-	-	-	-	731	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1040	-	193	563
Stage 1	-	-	-	-	603	-
Stage 2	-	-	-	-	476	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1040	-	165	563
Mov Cap-2 Maneuver	-	-	-	-	165	-
Stage 1	-	-	-	-	603	-
Stage 2	-	-	-	-	407	-

Approach	SE	NW	NE
HCM Control Delay, s	0	2.4	16.1
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	165	563	1040	-	-	-
HCM Lane V/C Ratio	0.152	0.248	0.146	-	-	-
HCM Control Delay (s)	30.7	13.5	9.1	-	-	-
HCM Lane LOS	D	B	A	-	-	-
HCM 95th %tile Q(veh)	0.5	1	0.5	-	-	-

Intersection	
Int Delay, s/veh	14.7

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	467	188	231	88	58	271
Future Vol, veh/h	467	188	231	88	58	271
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	325	-	-	270	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	531	214	263	100	66	308

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	363	0	-	0	1539	263
Stage 1	-	-	-	-	263	-
Stage 2	-	-	-	-	1276	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1196	-	-	-	127	776
Stage 1	-	-	-	-	781	-
Stage 2	-	-	-	-	262	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1196	-	-	-	71	776
Mov Cap-2 Maneuver	-	-	-	-	71	-
Stage 1	-	-	-	-	434	-
Stage 2	-	-	-	-	262	-

Approach	SE	NW	SW
HCM Control Delay, s	7.4	0	43.3
HCM LOS			E

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1196	-	71	776
HCM Lane V/C Ratio	-	-	0.444	-	0.928	0.397
HCM Control Delay (s)	-	-	10.4	-	186	12.7
HCM Lane LOS	-	-	B	-	F	B
HCM 95th %tile Q(veh)	-	-	2.3	-	4.7	1.9

Intersection	
Int Delay, s/veh	2.9

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	218	11	60	253	24	112
Future Vol, veh/h	218	11	60	253	24	112
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	245	485	-	105	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	248	13	68	288	27	127

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	261	0	672	248
Stage 1	-	-	-	-	248	-
Stage 2	-	-	-	-	424	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1303	-	421	791
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	660	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1303	-	399	791
Mov Cap-2 Maneuver	-	-	-	-	399	-
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	626	-

Approach	SE	NW	NE
HCM Control Delay, s	0	1.5	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	399	791	1303	-	-	-
HCM Lane V/C Ratio	0.068	0.161	0.052	-	-	-
HCM Control Delay (s)	14.7	10.4	7.9	-	-	-
HCM Lane LOS	B	B	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0.6	0.2	-	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	208	115	187	18	12	137
Future Vol, veh/h	208	115	187	18	12	137
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	325	-	-	270	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	236	131	213	20	14	156

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	233	0	-	0	816	213
Stage 1	-	-	-	-	213	-
Stage 2	-	-	-	-	603	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1335	-	-	-	347	827
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	546	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1335	-	-	-	286	827
Mov Cap-2 Maneuver	-	-	-	-	286	-
Stage 1	-	-	-	-	677	-
Stage 2	-	-	-	-	546	-

Approach	SE	NW	SW
HCM Control Delay, s	5.3	0	11
HCM LOS			B

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1335	-	286	827
HCM Lane V/C Ratio	-	-	0.177	-	0.048	0.188
HCM Control Delay (s)	-	-	8.3	-	18.2	10.4
HCM Lane LOS	-	-	A	-	C	B
HCM 95th %tile Q(veh)	-	-	0.6	-	0.1	0.7

Intersection	
Int Delay, s/veh	2.8

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	315	18	131	354	12	108
Future Vol, veh/h	315	18	131	354	12	108
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	245	485	-	105	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	358	20	149	402	14	123

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	378	0	1058	358
Stage 1	-	-	-	-	358	-
Stage 2	-	-	-	-	700	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1180	-	249	686
Stage 1	-	-	-	-	707	-
Stage 2	-	-	-	-	493	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1180	-	218	686
Mov Cap-2 Maneuver	-	-	-	-	218	-
Stage 1	-	-	-	-	707	-
Stage 2	-	-	-	-	431	-

Approach	SE	NW	NE
HCM Control Delay, s	0	2.3	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	218	686	1180	-	-	-
HCM Lane V/C Ratio	0.063	0.179	0.126	-	-	-
HCM Control Delay (s)	22.6	11.4	8.5	-	-	-
HCM Lane LOS	C	B	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0.6	0.4	-	-	-

Intersection	
Int Delay, s/veh	5.9

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	242	193	235	49	24	248
Future Vol, veh/h	242	193	235	49	24	248
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	325	-	-	270	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	275	219	267	56	27	282

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	323	0	-	0	1036	267
Stage 1	-	-	-	-	267	-
Stage 2	-	-	-	-	769	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1237	-	-	-	256	772
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	457	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1237	-	-	-	199	772
Mov Cap-2 Maneuver	-	-	-	-	199	-
Stage 1	-	-	-	-	605	-
Stage 2	-	-	-	-	457	-

Approach	SE	NW	SW
HCM Control Delay, s	4.9	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1237	-	199	772
HCM Lane V/C Ratio	-	-	0.222	-	0.137	0.365
HCM Control Delay (s)	-	-	8.7	-	25.9	12.3
HCM Lane LOS	-	-	A	-	D	B
HCM 95th %tile Q(veh)	-	-	0.9	-	0.5	1.7

Intersection	
Int Delay, s/veh	3.1

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	445	16	186	320	8	102
Future Vol, veh/h	445	16	186	320	8	102
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	245	485	-	105	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	506	18	211	364	9	116

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	524	0	1292	506
Stage 1	-	-	-	-	506	-
Stage 2	-	-	-	-	786	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1043	-	180	566
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	449	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1043	-	144	566
Mov Cap-2 Maneuver	-	-	-	-	144	-
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	358	-

Approach	SE	NW	NE
HCM Control Delay, s	0	3.4	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	144	566	1043	-	-	-
HCM Lane V/C Ratio	0.063	0.205	0.203	-	-	-
HCM Control Delay (s)	31.7	13	9.3	-	-	-
HCM Lane LOS	D	B	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0.8	0.8	-	-	-

Intersection	
Int Delay, s/veh	13.2

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	280	280	180	80	117	325
Future Vol, veh/h	280	280	180	80	117	325
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	325	-	-	270	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	318	318	205	91	133	369

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	296	0	-	0	1159	205
Stage 1	-	-	-	-	205	-
Stage 2	-	-	-	-	954	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1265	-	-	-	216	836
Stage 1	-	-	-	-	829	-
Stage 2	-	-	-	-	374	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1265	-	-	-	162	836
Mov Cap-2 Maneuver	-	-	-	-	162	-
Stage 1	-	-	-	-	621	-
Stage 2	-	-	-	-	374	-

Approach	SE	NW	SW
HCM Control Delay, s	4.4	0	32.1
HCM LOS			D

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1265	-	162	836
HCM Lane V/C Ratio	-	-	0.252	-	0.821	0.442
HCM Control Delay (s)	-	-	8.8	-	86.1	12.7
HCM Lane LOS	-	-	A	-	F	B
HCM 95th %tile Q(veh)	-	-	1	-	5.5	2.3

Intersection	
Int Delay, s/veh	2.8

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	277	9	88	303	12	122
Future Vol, veh/h	277	9	88	303	12	122
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	245	485	-	105	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	315	10	100	344	14	139

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	325	0	859	315
Stage 1	-	-	-	-	315	-
Stage 2	-	-	-	-	544	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1235	-	327	725
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	582	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1235	-	301	725
Mov Cap-2 Maneuver	-	-	-	-	301	-
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	535	-

Approach	SE	NW	NE
HCM Control Delay, s	0	1.8	11.7
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	301	725	1235	-	-	-
HCM Lane V/C Ratio	0.045	0.191	0.081	-	-	-
HCM Control Delay (s)	17.5	11.1	8.2	-	-	-
HCM Lane LOS	C	B	A	-	-	-
HCM 95th %tile Q(veh)	0.1	0.7	0.3	-	-	-

Intersection	
Int Delay, s/veh	8.9

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	230	183	188	28	112	199
Future Vol, veh/h	230	183	188	28	112	199
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	325	-	-	270	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	261	208	214	32	127	226

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	246	0	-	0	944	214
Stage 1	-	-	-	-	214	-
Stage 2	-	-	-	-	730	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1320	-	-	-	291	826
Stage 1	-	-	-	-	822	-
Stage 2	-	-	-	-	477	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1320	-	-	-	233	826
Mov Cap-2 Maneuver	-	-	-	-	233	-
Stage 1	-	-	-	-	659	-
Stage 2	-	-	-	-	477	-

Approach	SE	NW	SW
HCM Control Delay, s	4.7	0	20.6
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1320	-	233	826
HCM Lane V/C Ratio	-	-	0.198	-	0.546	0.274
HCM Control Delay (s)	-	-	8.4	-	37.6	11
HCM Lane LOS	-	-	A	-	E	B
HCM 95th %tile Q(veh)	-	-	0.7	-	3	1.1

Intersection	
Int Delay, s/veh	3.2

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	463	15	136	387	22	125
Future Vol, veh/h	463	15	136	387	22	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	245	485	-	105	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	526	17	155	440	25	142

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	543	0	1276	526
Stage 1	-	-	-	-	526	-
Stage 2	-	-	-	-	750	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1026	-	184	552
Stage 1	-	-	-	-	593	-
Stage 2	-	-	-	-	467	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1026	-	156	552
Mov Cap-2 Maneuver	-	-	-	-	156	-
Stage 1	-	-	-	-	593	-
Stage 2	-	-	-	-	396	-

Approach	SE	NW	NE
HCM Control Delay, s	0	2.4	16.6
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	156	552	1026	-	-	-
HCM Lane V/C Ratio	0.16	0.257	0.151	-	-	-
HCM Control Delay (s)	32.4	13.8	9.1	-	-	-
HCM Lane LOS	D	B	A	-	-	-
HCM 95th %tile Q(veh)	0.6	1	0.5	-	-	-

Intersection	
Int Delay, s/veh	16.9

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	480	194	238	91	60	279
Future Vol, veh/h	480	194	238	91	60	279
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	325	-	-	270	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	545	220	270	103	68	317

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	373	0	-	0	1580	270
Stage 1	-	-	-	-	270	-
Stage 2	-	-	-	-	1310	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1185	-	-	-	120	769
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	252	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1185	-	-	-	~ 65	769
Mov Cap-2 Maneuver	-	-	-	-	~ 65	-
Stage 1	-	-	-	-	419	-
Stage 2	-	-	-	-	252	-

Approach	SE	NW	SW
HCM Control Delay, s	7.6	0	51.9
HCM LOS			F

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1185	-	65	769
HCM Lane V/C Ratio	-	-	0.46	-	1.049	0.412
HCM Control Delay (s)	-	-	10.6	-	233.5	12.9
HCM Lane LOS	-	-	B	-	F	B
HCM 95th %tile Q(veh)	-	-	2.5	-	5.3	2

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

Intersection	
Int Delay, s/veh	2.9

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	225	11	61	260	24	114
Future Vol, veh/h	225	11	61	260	24	114
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	245	485	-	105	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	256	13	69	295	27	130

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	269	0	689	256
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	433	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1295	-	412	783
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	654	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1295	-	390	783
Mov Cap-2 Maneuver	-	-	-	-	390	-
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	619	-

Approach	SE	NW	NE
HCM Control Delay, s	0	1.5	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	390	783	1295	-	-	-
HCM Lane V/C Ratio	0.07	0.165	0.054	-	-	-
HCM Control Delay (s)	14.9	10.5	7.9	-	-	-
HCM Lane LOS	B	B	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0.6	0.2	-	-	-

Intersection	
Int Delay, s/veh	5

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	214	118	193	19	12	141
Future Vol, veh/h	214	118	193	19	12	141
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	325	-	-	270	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	243	134	219	22	14	160

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	241	0	-	0	839	219
Stage 1	-	-	-	-	219	-
Stage 2	-	-	-	-	620	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1326	-	-	-	336	821
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	536	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1326	-	-	-	275	821
Mov Cap-2 Maneuver	-	-	-	-	275	-
Stage 1	-	-	-	-	667	-
Stage 2	-	-	-	-	536	-

Approach	SE	NW	SW
HCM Control Delay, s	5.4	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1326	-	275	821
HCM Lane V/C Ratio	-	-	0.183	-	0.05	0.195
HCM Control Delay (s)	-	-	8.3	-	18.8	10.4
HCM Lane LOS	-	-	A	-	C	B
HCM 95th %tile Q(veh)	-	-	0.7	-	0.2	0.7

Intersection	
Int Delay, s/veh	2.8

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	325	18	133	365	12	110
Future Vol, veh/h	325	18	133	365	12	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	245	485	-	105	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	369	20	151	415	14	125

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	389	0	1086	369
Stage 1	-	-	-	-	369	-
Stage 2	-	-	-	-	717	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1170	-	239	677
Stage 1	-	-	-	-	699	-
Stage 2	-	-	-	-	484	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1170	-	208	677
Mov Cap-2 Maneuver	-	-	-	-	208	-
Stage 1	-	-	-	-	699	-
Stage 2	-	-	-	-	422	-

Approach	SE	NW	NE
HCM Control Delay, s	0	2.3	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	208	677	1170	-	-	-
HCM Lane V/C Ratio	0.066	0.185	0.129	-	-	-
HCM Control Delay (s)	23.5	11.5	8.5	-	-	-
HCM Lane LOS	C	B	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0.7	0.4	-	-	-

Intersection	
Int Delay, s/veh	6

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	249	199	242	50	25	255
Future Vol, veh/h	249	199	242	50	25	255
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	325	-	-	270	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	283	226	275	57	28	290

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	332	0	-	0	1067	275
Stage 1	-	-	-	-	275	-
Stage 2	-	-	-	-	792	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1227	-	-	-	246	764
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	446	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1227	-	-	-	189	764
Mov Cap-2 Maneuver	-	-	-	-	189	-
Stage 1	-	-	-	-	593	-
Stage 2	-	-	-	-	446	-

Approach	SE	NW	SW
HCM Control Delay, s	4.9	0	13.9
HCM LOS			B

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1227	-	189	764
HCM Lane V/C Ratio	-	-	0.231	-	0.15	0.379
HCM Control Delay (s)	-	-	8.8	-	27.4	12.6
HCM Lane LOS	-	-	A	-	D	B
HCM 95th %tile Q(veh)	-	-	0.9	-	0.5	1.8

Intersection	
Int Delay, s/veh	4

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	445	28	289	320	9	112
Future Vol, veh/h	445	28	289	320	9	112
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	245	485	-	105	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	506	32	328	364	10	127

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	538	0	1526	506
Stage 1	-	-	-	-	506	-
Stage 2	-	-	-	-	1020	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1030	-	130	566
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	348	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1030	-	89	566
Mov Cap-2 Maneuver	-	-	-	-	89	-
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	237	-

Approach	SE	NW	NE
HCM Control Delay, s	0	4.8	16
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	89	566	1030	-	-	-
HCM Lane V/C Ratio	0.115	0.225	0.319	-	-	-
HCM Control Delay (s)	50.6	13.2	10.1	-	-	-
HCM Lane LOS	F	B	B	-	-	-
HCM 95th %tile Q(veh)	0.4	0.9	1.4	-	-	-

Intersection	
Int Delay, s/veh	15.2

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	288	282	197	80	117	411
Future Vol, veh/h	288	282	197	80	117	411
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	325	-	-	270	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	327	320	224	91	133	467

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	315	0	-	0	1198	224
Stage 1	-	-	-	-	224	-
Stage 2	-	-	-	-	974	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1245	-	-	-	205	815
Stage 1	-	-	-	-	813	-
Stage 2	-	-	-	-	366	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1245	-	-	-	151	815
Mov Cap-2 Maneuver	-	-	-	-	151	-
Stage 1	-	-	-	-	599	-
Stage 2	-	-	-	-	366	-

Approach	SE	NW	SW
HCM Control Delay, s	4.5	0	34.6
HCM LOS			D

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1245	-	151	815
HCM Lane V/C Ratio	-	-	0.263	-	0.88	0.573
HCM Control Delay (s)	-	-	8.9	-	102.8	15.2
HCM Lane LOS	-	-	A	-	F	C
HCM 95th %tile Q(veh)	-	-	1.1	-	6	3.7

Intersection	
Int Delay, s/veh	3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	75	0	115	130	0	11
Future Vol, veh/h	75	0	115	130	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	85	0	131	148	0	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	85	0	495	85
Stage 1	-	-	-	-	85	-
Stage 2	-	-	-	-	410	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1512	-	534	974
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	670	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1512	-	484	974
Mov Cap-2 Maneuver	-	-	-	-	484	-
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	607	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.6	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	974	-	-	1512	-
HCM Lane V/C Ratio	0.013	-	-	0.086	-
HCM Control Delay (s)	8.7	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0.3	-

Intersection	
Int Delay, s/veh	4.5

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	277	31	286	303	14	141
Future Vol, veh/h	277	31	286	303	14	141
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	245	485	-	105	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	315	35	325	344	16	160

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	350	0	1309	315
Stage 1	-	-	-	-	315	-
Stage 2	-	-	-	-	994	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1209	-	176	725
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	358	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1209	-	129	725
Mov Cap-2 Maneuver	-	-	-	-	129	-
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	262	-

Approach	SE	NW	NE
HCM Control Delay, s	0	4.4	13.7
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	129	725	1209	-	-	-
HCM Lane V/C Ratio	0.123	0.221	0.269	-	-	-
HCM Control Delay (s)	36.8	11.4	9.1	-	-	-
HCM Lane LOS	E	B	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0.8	1.1	-	-	-

Intersection	
Int Delay, s/veh	11

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	246	186	221	28	112	364
Future Vol, veh/h	246	186	221	28	112	364
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	325	-	-	270	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	280	211	251	32	127	414

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	283	0	-	0	1022	251
Stage 1	-	-	-	-	251	-
Stage 2	-	-	-	-	771	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1279	-	-	-	261	788
Stage 1	-	-	-	-	791	-
Stage 2	-	-	-	-	456	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1279	-	-	-	204	788
Mov Cap-2 Maneuver	-	-	-	-	204	-
Stage 1	-	-	-	-	618	-
Stage 2	-	-	-	-	456	-

Approach	SE	NW	SW
HCM Control Delay, s	4.9	0	22.4
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1279	-	204	788
HCM Lane V/C Ratio	-	-	0.219	-	0.624	0.525
HCM Control Delay (s)	-	-	8.6	-	48.1	14.5
HCM Lane LOS	-	-	A	-	E	B
HCM 95th %tile Q(veh)	-	-	0.8	-	3.6	3.1

Intersection	
Int Delay, s/veh	4.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	90	0	220	65	0	21
Future Vol, veh/h	90	0	220	65	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	102	0	250	74	0	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	102	0	676	102
Stage 1	-	-	-	-	102	-
Stage 2	-	-	-	-	574	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1490	-	419	953
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	563	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1490	-	346	953
Mov Cap-2 Maneuver	-	-	-	-	346	-
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	464	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.1	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	953	-	-	1490	-
HCM Lane V/C Ratio	0.025	-	-	0.168	-
HCM Control Delay (s)	8.9	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.6	-

Intersection	
Int Delay, s/veh	6

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	463	17	149	387	38	264
Future Vol, veh/h	463	17	149	387	38	264
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	245	485	-	105	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	526	19	169	440	43	300

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	545	0	1304	526
Stage 1	-	-	-	-	526	-
Stage 2	-	-	-	-	778	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1024	-	177	552
Stage 1	-	-	-	-	593	-
Stage 2	-	-	-	-	453	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1024	-	148	552
Mov Cap-2 Maneuver	-	-	-	-	148	-
Stage 1	-	-	-	-	593	-
Stage 2	-	-	-	-	378	-

Approach	SE	NW	NE
HCM Control Delay, s	0	2.6	21.5
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	148	552	1024	-	-	-
HCM Lane V/C Ratio	0.292	0.543	0.165	-	-	-
HCM Control Delay (s)	39	19	9.2	-	-	-
HCM Lane LOS	E	C	A	-	-	-
HCM 95th %tile Q(veh)	1.1	3.2	0.6	-	-	-

Intersection	
Int Delay, s/veh	36.3

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	596	217	240	91	60	290
Future Vol, veh/h	596	217	240	91	60	290
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	325	-	-	270	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	677	247	273	103	68	330

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	376	0	-	0	1874	273
Stage 1	-	-	-	-	273	-
Stage 2	-	-	-	-	1601	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1182	-	-	-	79	766
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	182	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1182	-	-	-	~ 34	766
Mov Cap-2 Maneuver	-	-	-	-	~ 34	-
Stage 1	-	-	-	-	330	-
Stage 2	-	-	-	-	182	-

Approach	SE	NW	SW
HCM Control Delay, s	8.8	0	134.4
HCM LOS			F

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1182	-	34	766
HCM Lane V/C Ratio	-	-	0.573	-	2.005	0.43
HCM Control Delay (s)	-	-	12	-	$ 720.1	13.2
HCM Lane LOS	-	-	B	-	F	B
HCM 95th %tile Q(veh)	-	-	3.8	-	7.6	2.2

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

Intersection	
Int Delay, s/veh	4.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	110	0	15	100	0	155
Future Vol, veh/h	110	0	15	100	0	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	125	0	17	114	0	176

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	125	0	273	125
Stage 1	-	-	-	-	125	-
Stage 2	-	-	-	-	148	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1462	-	716	926
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	880	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1462	-	707	926
Mov Cap-2 Maneuver	-	-	-	-	707	-
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	869	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	926	-	-	1462	-
HCM Lane V/C Ratio	0.19	-	-	0.012	-
HCM Control Delay (s)	9.8	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0	-

Intersection	
Int Delay, s/veh	4.7

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	225	33	259	260	26	133
Future Vol, veh/h	225	33	259	260	26	133
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	245	485	-	105	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	256	38	294	295	30	151

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	294	0	1139	256
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	883	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1268	-	223	783
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	404	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1268	-	171	783
Mov Cap-2 Maneuver	-	-	-	-	171	-
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	310	-

Approach	SE	NW	NE
HCM Control Delay, s	0	4.3	13.9
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	171	783	1268	-	-	-
HCM Lane V/C Ratio	0.173	0.193	0.232	-	-	-
HCM Control Delay (s)	30.4	10.7	8.7	-	-	-
HCM Lane LOS	D	B	A	-	-	-
HCM 95th %tile Q(veh)	0.6	0.7	0.9	-	-	-

Intersection	
Int Delay, s/veh	6.8

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	230	121	226	19	12	306
Future Vol, veh/h	230	121	226	19	12	306
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	325	-	-	270	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	261	138	257	22	14	348

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	279	0	-	0	917	257
Stage 1	-	-	-	-	257	-
Stage 2	-	-	-	-	660	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1284	-	-	-	302	782
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	514	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1284	-	-	-	241	782
Mov Cap-2 Maneuver	-	-	-	-	241	-
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	514	-

Approach	SE	NW	SW
HCM Control Delay, s	5.6	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1284	-	241	782
HCM Lane V/C Ratio	-	-	0.204	-	0.057	0.445
HCM Control Delay (s)	-	-	8.5	-	20.8	13.2
HCM Lane LOS	-	-	A	-	C	B
HCM 95th %tile Q(veh)	-	-	0.8	-	0.2	2.3

Intersection	
Int Delay, s/veh	5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	85	0	220	60	0	21
Future Vol, veh/h	85	0	220	60	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	97	0	250	68	0	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	97	0	665	97
Stage 1	-	-	-	-	97	-
Stage 2	-	-	-	-	568	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1496	-	425	959
Stage 1	-	-	-	-	927	-
Stage 2	-	-	-	-	567	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1496	-	351	959
Mov Cap-2 Maneuver	-	-	-	-	351	-
Stage 1	-	-	-	-	927	-
Stage 2	-	-	-	-	468	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.2	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	959	-	-	1496	-
HCM Lane V/C Ratio	0.025	-	-	0.167	-
HCM Control Delay (s)	8.9	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.6	-

Intersection	
Int Delay, s/veh	4.9

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	325	20	146	365	28	249
Future Vol, veh/h	325	20	146	365	28	249
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	245	485	-	105	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	369	23	166	415	32	283

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	392	0	1116	369
Stage 1	-	-	-	-	369	-
Stage 2	-	-	-	-	747	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1167	-	230	677
Stage 1	-	-	-	-	699	-
Stage 2	-	-	-	-	468	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1167	-	197	677
Mov Cap-2 Maneuver	-	-	-	-	197	-
Stage 1	-	-	-	-	699	-
Stage 2	-	-	-	-	402	-

Approach	SE	NW	NE
HCM Control Delay, s	0	2.5	15.4
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	197	677	1167	-	-	-
HCM Lane V/C Ratio	0.162	0.418	0.142	-	-	-
HCM Control Delay (s)	26.8	14.1	8.6	-	-	-
HCM Lane LOS	D	B	A	-	-	-
HCM 95th %tile Q(veh)	0.6	2.1	0.5	-	-	-

Intersection	
Int Delay, s/veh	6.9

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	365	222	244	50	25	266
Future Vol, veh/h	365	222	244	50	25	266
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	325	-	-	270	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	415	252	277	57	28	302

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	334	0	-	0	1359	277
Stage 1	-	-	-	-	277	-
Stage 2	-	-	-	-	1082	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1225	-	-	-	164	762
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	325	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1225	-	-	-	108	762
Mov Cap-2 Maneuver	-	-	-	-	108	-
Stage 1	-	-	-	-	509	-
Stage 2	-	-	-	-	325	-

Approach	SE	NW	SW
HCM Control Delay, s	5.9	0	16
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1225	-	108	762
HCM Lane V/C Ratio	-	-	0.339	-	0.263	0.397
HCM Control Delay (s)	-	-	9.4	-	49.8	12.8
HCM Lane LOS	-	-	A	-	E	B
HCM 95th %tile Q(veh)	-	-	1.5	-	1	1.9

Intersection	
Int Delay, s/veh	4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	95	0	15	90	0	155
Future Vol, veh/h	95	0	15	90	0	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	108	0	17	102	0	176

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	108	0	244	108
Stage 1	-	-	-	-	108	-
Stage 2	-	-	-	-	136	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1483	-	744	946
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	890	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1483	-	735	946
Mov Cap-2 Maneuver	-	-	-	-	735	-
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	879	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	946	-	-	1483	-
HCM Lane V/C Ratio	0.186	-	-	0.011	-
HCM Control Delay (s)	9.7	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0	-

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Approach	SE	NW	NE
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	625	659	136
Demand Flow Rate, veh/h	637	673	139
Vehicles Circulating, veh/h	232	11	614
Vehicles Exiting, veh/h	452	741	255
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	10.9	7.8	7.1
Approach LOS	B	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	637	673	139
Cap Entry Lane, veh/h	1089	1364	738
Entry HV Adj Factor	0.981	0.980	0.978
Flow Entry, veh/h	625	659	136
Cap Entry, veh/h	1069	1337	722
V/C Ratio	0.585	0.493	0.188
Control Delay, s/veh	10.9	7.8	7.1
LOS	B	A	A
95th %tile Queue, veh	4	3	1

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Approach	SE	NW	SW
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	728	335	591
Demand Flow Rate, veh/h	742	342	603
Vehicles Circulating, veh/h	162	371	232
Vehicles Exiting, veh/h	673	533	481
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	11.6	7.9	10.2
Approach LOS	B	A	B

Lane	Left	Left	Left
Designated Moves	LT	TR	LR
Assumed Moves	LT	TR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	742	342	603
Cap Entry Lane, veh/h	1170	945	1089
Entry HV Adj Factor	0.981	0.981	0.980
Flow Entry, veh/h	728	335	591
Cap Entry, veh/h	1147	927	1067
V/C Ratio	0.634	0.362	0.554
Control Delay, s/veh	11.6	7.9	10.2
LOS	B	A	B
95th %tile Queue, veh	5	2	4

Intersection	
Intersection Delay, s/veh	6.1
Intersection LOS	A

Approach	SE	NW	NE
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	386	518	166
Demand Flow Rate, veh/h	393	528	169
Vehicles Circulating, veh/h	111	15	382
Vehicles Exiting, veh/h	432	536	122
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	6.0	6.4	5.7
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	393	528	169
Cap Entry Lane, veh/h	1232	1359	935
Entry HV Adj Factor	0.981	0.981	0.982
Flow Entry, veh/h	386	518	166
Cap Entry, veh/h	1209	1333	918
V/C Ratio	0.319	0.389	0.181
Control Delay, s/veh	6.0	6.4	5.7
LOS	A	A	A
95th %tile Queue, veh	1	2	1

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Approach	SE	NW	SW
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	556	294	425
Demand Flow Rate, veh/h	567	300	433
Vehicles Circulating, veh/h	155	318	261
Vehicles Exiting, veh/h	539	404	357
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	8.4	6.8	7.9
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LT	TR	LR
Assumed Moves	LT	TR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	567	300	433
Cap Entry Lane, veh/h	1178	998	1057
Entry HV Adj Factor	0.981	0.980	0.982
Flow Entry, veh/h	556	294	425
Cap Entry, veh/h	1155	977	1038
V/C Ratio	0.481	0.301	0.410
Control Delay, s/veh	8.4	6.8	7.9
LOS	A	A	A
95th %tile Queue, veh	3	1	2

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Approach	SE	NW	NE
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	649	697	183
Demand Flow Rate, veh/h	662	711	187
Vehicles Circulating, veh/h	172	28	644
Vehicles Exiting, veh/h	567	803	190
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	10.2	8.4	8.3
Approach LOS	B	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	662	711	187
Cap Entry Lane, veh/h	1158	1341	715
Entry HV Adj Factor	0.981	0.981	0.979
Flow Entry, veh/h	649	697	183
Cap Entry, veh/h	1136	1315	700
V/C Ratio	0.572	0.530	0.261
Control Delay, s/veh	10.2	8.4	8.3
LOS	B	A	A
95th %tile Queue, veh	4	3	1

Intersection	
Intersection Delay, s/veh	13.5
Intersection LOS	B

Approach	SE	NW	SW
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	909	437	455
Demand Flow Rate, veh/h	927	445	464
Vehicles Circulating, veh/h	82	661	324
Vehicles Exiting, veh/h	706	348	782
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	13.9	16.9	9.3
Approach LOS	B	C	A

Lane	Left	Left	Left
Designated Moves	LT	TR	LR
Assumed Moves	LT	TR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	927	445	464
Cap Entry Lane, veh/h	1269	703	992
Entry HV Adj Factor	0.980	0.981	0.981
Flow Entry, veh/h	909	437	455
Cap Entry, veh/h	1244	690	972
V/C Ratio	0.730	0.633	0.468
Control Delay, s/veh	13.9	16.9	9.3
LOS	B	C	A
95th %tile Queue, veh	7	5	3

Intersection	
Intersection Delay, s/veh	5.4
Intersection LOS	A

Approach	SE	NW	NE
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	321	428	172
Demand Flow Rate, veh/h	327	437	176
Vehicles Circulating, veh/h	78	31	313
Vehicles Exiting, veh/h	390	458	92
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	5.2	5.7	5.3
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	327	437	176
Cap Entry Lane, veh/h	1274	1337	1003
Entry HV Adj Factor	0.981	0.979	0.977
Flow Entry, veh/h	321	428	172
Cap Entry, veh/h	1250	1309	980
V/C Ratio	0.257	0.327	0.176
Control Delay, s/veh	5.2	5.7	5.3
LOS	A	A	A
95th %tile Queue, veh	1	1	1

Intersection	
Intersection Delay, s/veh	5.9
Intersection LOS	A

Approach	SE	NW	SW
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	449	287	209
Demand Flow Rate, veh/h	458	293	213
Vehicles Circulating, veh/h	16	296	266
Vehicles Exiting, veh/h	463	178	323
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	5.8	6.5	5.4
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LT	TR	LR
Assumed Moves	LT	TR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	458	293	213
Cap Entry Lane, veh/h	1358	1020	1052
Entry HV Adj Factor	0.980	0.979	0.981
Flow Entry, veh/h	449	287	209
Cap Entry, veh/h	1330	999	1032
V/C Ratio	0.337	0.287	0.202
Control Delay, s/veh	5.8	6.5	5.4
LOS	A	A	A
95th %tile Queue, veh	2	1	1

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Approach	SE	NW	NE
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	466	659	151
Demand Flow Rate, veh/h	475	672	154
Vehicles Circulating, veh/h	168	15	452
Vehicles Exiting, veh/h	519	591	191
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	7.4	7.8	6.0
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	475	672	154
Cap Entry Lane, veh/h	1163	1359	870
Entry HV Adj Factor	0.981	0.981	0.981
Flow Entry, veh/h	466	659	151
Cap Entry, veh/h	1141	1333	853
V/C Ratio	0.409	0.495	0.177
Control Delay, s/veh	7.4	7.8	6.0
LOS	A	A	A
95th %tile Queue, veh	2	3	1

Intersection	
Intersection Delay, s/veh	8.0
Intersection LOS	A

Approach	SE	NW	SW
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	608	398	381
Demand Flow Rate, veh/h	620	406	389
Vehicles Circulating, veh/h	35	348	337
Vehicles Exiting, veh/h	691	307	417
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	7.5	8.6	8.2
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LT	TR	LR
Assumed Moves	LT	TR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	620	406	389
Cap Entry Lane, veh/h	1331	968	979
Entry HV Adj Factor	0.980	0.981	0.979
Flow Entry, veh/h	608	398	381
Cap Entry, veh/h	1305	949	958
V/C Ratio	0.466	0.420	0.398
Control Delay, s/veh	7.5	8.6	8.2
LOS	A	A	A
95th %tile Queue, veh	3	2	2

Intersection	
Intersection Delay, s/veh	11.3
Intersection LOS	B

Approach	SE	NW	NE
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	638	776	148
Demand Flow Rate, veh/h	651	792	151
Vehicles Circulating, veh/h	351	12	614
Vehicles Exiting, veh/h	453	753	388
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	14.7	9.3	7.3
Approach LOS	B	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	651	792	151
Cap Entry Lane, veh/h	965	1363	738
Entry HV Adj Factor	0.980	0.980	0.980
Flow Entry, veh/h	638	776	148
Cap Entry, veh/h	945	1336	723
V/C Ratio	0.675	0.581	0.205
Control Delay, s/veh	14.7	9.3	7.3
LOS	B	A	A
95th %tile Queue, veh	5	4	1

Intersection	
Intersection Delay, s/veh	11.6
Intersection LOS	B

Approach	SE	NW	SW
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	739	355	689
Demand Flow Rate, veh/h	753	362	703
Vehicles Circulating, veh/h	162	380	252
Vehicles Exiting, veh/h	793	535	490
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	11.8	8.3	13.1
Approach LOS	B	A	B

Lane	Left	Left	Left
Designated Moves	LT	TR	LR
Assumed Moves	LT	TR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	753	362	703
Cap Entry Lane, veh/h	1170	937	1067
Entry HV Adj Factor	0.981	0.981	0.980
Flow Entry, veh/h	739	355	689
Cap Entry, veh/h	1147	919	1046
V/C Ratio	0.644	0.387	0.659
Control Delay, s/veh	11.8	8.3	13.1
LOS	B	A	B
95th %tile Queue, veh	5	2	5

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	85	0	115	140	0	11
Future Vol, veh/h	85	0	115	140	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	97	0	131	159	0	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	97	0	518	97
Stage 1	-	-	-	-	97	-
Stage 2	-	-	-	-	421	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1496	-	518	959
Stage 1	-	-	-	-	927	-
Stage 2	-	-	-	-	662	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1496	-	468	959
Mov Cap-2 Maneuver	-	-	-	-	468	-
Stage 1	-	-	-	-	927	-
Stage 2	-	-	-	-	598	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.4	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	959	-	-	1496	-
HCM Lane V/C Ratio	0.013	-	-	0.087	-
HCM Control Delay (s)	8.8	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0.3	-

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Approach	SE	NW	NE
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	411	743	190
Demand Flow Rate, veh/h	419	758	193
Vehicles Circulating, veh/h	341	17	382
Vehicles Exiting, veh/h	434	558	378
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	8.7	8.9	6.0
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	419	758	193
Cap Entry Lane, veh/h	975	1356	935
Entry HV Adj Factor	0.980	0.980	0.984
Flow Entry, veh/h	411	743	190
Cap Entry, veh/h	955	1329	920
V/C Ratio	0.430	0.559	0.207
Control Delay, s/veh	8.7	8.9	6.0
LOS	A	A	A
95th %tile Queue, veh	2	4	1

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Approach	SE	NW	SW
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	579	331	612
Demand Flow Rate, veh/h	591	338	624
Vehicles Circulating, veh/h	155	338	299
Vehicles Exiting, veh/h	768	408	377
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	8.7	7.5	12.2
Approach LOS	A	A	B

Lane	Left	Left	Left
Designated Moves	LT	TR	LR
Assumed Moves	LT	TR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	591	338	624
Cap Entry Lane, veh/h	1178	978	1017
Entry HV Adj Factor	0.980	0.980	0.981
Flow Entry, veh/h	579	331	612
Cap Entry, veh/h	1154	958	998
V/C Ratio	0.502	0.346	0.613
Control Delay, s/veh	8.7	7.5	12.2
LOS	A	A	B
95th %tile Queue, veh	3	2	4

Intersection	
Int Delay, s/veh	4.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	100	0	220	70	0	21
Future Vol, veh/h	100	0	220	70	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	114	0	250	80	0	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	114	0	694	114
Stage 1	-	-	-	-	114	-
Stage 2	-	-	-	-	580	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1475	-	409	939
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	560	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1475	-	337	939
Mov Cap-2 Maneuver	-	-	-	-	337	-
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	461	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	939	-	-	1475	-
HCM Lane V/C Ratio	0.025	-	-	0.169	-
HCM Control Delay (s)	8.9	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.6	-

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Approach	SE	NW	NE
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	651	712	359
Demand Flow Rate, veh/h	664	727	366
Vehicles Circulating, veh/h	188	46	644
Vehicles Exiting, veh/h	585	964	208
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	10.5	8.9	12.9
Approach LOS	B	A	B

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	664	727	366
Cap Entry Lane, veh/h	1139	1317	715
Entry HV Adj Factor	0.981	0.980	0.981
Flow Entry, veh/h	651	712	359
Cap Entry, veh/h	1117	1290	702
V/C Ratio	0.583	0.552	0.512
Control Delay, s/veh	10.5	8.9	12.9
LOS	B	A	B
95th %tile Queue, veh	4	4	3

Intersection	
Intersection Delay, s/veh	20.0
Intersection LOS	C

Approach	SE	NW	SW
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	1073	450	475
Demand Flow Rate, veh/h	1095	459	485
Vehicles Circulating, veh/h	84	801	333
Vehicles Exiting, veh/h	734	378	927
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	22.1	25.8	9.8
Approach LOS	C	D	A

Lane	Left	Left	Left
Designated Moves	LT	TR	LR
Assumed Moves	LT	TR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	1095	459	485
Cap Entry Lane, veh/h	1267	610	983
Entry HV Adj Factor	0.980	0.981	0.979
Flow Entry, veh/h	1073	450	475
Cap Entry, veh/h	1241	598	962
V/C Ratio	0.865	0.753	0.494
Control Delay, s/veh	22.1	25.8	9.8
LOS	C	D	A
95th %tile Queue, veh	12	7	3

Intersection	
Int Delay, s/veh	4.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	120	0	15	110	0	155
Future Vol, veh/h	120	0	15	110	0	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	136	0	17	125	0	176

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	136	0	295	136
Stage 1	-	-	-	-	136	-
Stage 2	-	-	-	-	159	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1448	-	696	913
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	870	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1448	-	687	913
Mov Cap-2 Maneuver	-	-	-	-	687	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	859	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	913	-	-	1448	-
HCM Lane V/C Ratio	0.193	-	-	0.012	-
HCM Control Delay (s)	9.9	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0	-

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Approach	SE	NW	NE
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	346	653	196
Demand Flow Rate, veh/h	353	666	200
Vehicles Circulating, veh/h	307	33	313
Vehicles Exiting, veh/h	392	480	347
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	7.3	8.0	5.6
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	353	666	200
Cap Entry Lane, veh/h	1009	1334	1003
Entry HV Adj Factor	0.980	0.980	0.980
Flow Entry, veh/h	346	653	196
Cap Entry, veh/h	989	1308	983
V/C Ratio	0.350	0.499	0.199
Control Delay, s/veh	7.3	8.0	5.6
LOS	A	A	A
95th %tile Queue, veh	2	3	1

Intersection	
Intersection Delay, s/veh	7.0
Intersection LOS	A

Approach	SE	NW	SW
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	470	325	397
Demand Flow Rate, veh/h	479	332	405
Vehicles Circulating, veh/h	16	314	305
Vehicles Exiting, veh/h	694	181	341
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	5.9	7.1	8.0
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LT	TR	LR
Assumed Moves	LT	TR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	479	332	405
Cap Entry Lane, veh/h	1358	1002	1011
Entry HV Adj Factor	0.981	0.979	0.980
Flow Entry, veh/h	470	325	397
Cap Entry, veh/h	1331	981	991
V/C Ratio	0.353	0.331	0.401
Control Delay, s/veh	5.9	7.1	8.0
LOS	A	A	A
95th %tile Queue, veh	2	1	2

Intersection	
Int Delay, s/veh	4.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	95	0	220	65	0	21
Future Vol, veh/h	95	0	220	65	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	108	0	250	74	0	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	108	0	682	108
Stage 1	-	-	-	-	108	-
Stage 2	-	-	-	-	574	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1483	-	415	946
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	563	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1483	-	342	946
Mov Cap-2 Maneuver	-	-	-	-	342	-
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	464	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.1	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	946	-	-	1483	-
HCM Lane V/C Ratio	0.025	-	-	0.169	-
HCM Control Delay (s)	8.9	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.6	-

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Approach	SE	NW	NE
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	468	674	327
Demand Flow Rate, veh/h	478	688	334
Vehicles Circulating, veh/h	184	34	452
Vehicles Exiting, veh/h	538	752	209
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	7.6	8.2	8.8
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	478	688	334
Cap Entry Lane, veh/h	1144	1333	870
Entry HV Adj Factor	0.979	0.980	0.979
Flow Entry, veh/h	468	674	327
Cap Entry, veh/h	1120	1306	852
V/C Ratio	0.418	0.516	0.384
Control Delay, s/veh	7.6	8.2	8.8
LOS	A	A	A
95th %tile Queue, veh	2	3	2

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Approach	SE	NW	SW
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	766	400	393
Demand Flow Rate, veh/h	781	408	401
Vehicles Circulating, veh/h	35	482	339
Vehicles Exiting, veh/h	705	334	551
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	9.5	10.8	8.4
Approach LOS	A	B	A

Lane	Left	Left	Left
Designated Moves	LT	TR	LR
Assumed Moves	LT	TR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	781	408	401
Cap Entry Lane, veh/h	1331	844	977
Entry HV Adj Factor	0.981	0.981	0.980
Flow Entry, veh/h	766	400	393
Cap Entry, veh/h	1306	828	957
V/C Ratio	0.587	0.483	0.411
Control Delay, s/veh	9.5	10.8	8.4
LOS	A	B	A
95th %tile Queue, veh	4	3	2

Intersection	
Int Delay, s/veh	4.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	105	0	15	100	0	155
Future Vol, veh/h	105	0	15	100	0	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	119	0	17	114	0	176

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	119	0	267	119
Stage 1	-	-	-	-	119	-
Stage 2	-	-	-	-	148	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1469	-	722	933
Stage 1	-	-	-	-	906	-
Stage 2	-	-	-	-	880	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1469	-	713	933
Mov Cap-2 Maneuver	-	-	-	-	713	-
Stage 1	-	-	-	-	906	-
Stage 2	-	-	-	-	869	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	933	-	-	1469	-
HCM Lane V/C Ratio	0.189	-	-	0.012	-
HCM Control Delay (s)	9.8	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0	-

Visual Analysis

of proposed projects at Shadow Mountain Bike Park

December 2023

Prepared for:

Shadow Mountain Bike Park

Prepared by:

SE Group
PO Box 2729
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and

Perkins&Will

Introduction

This visual analysis includes a summary of visual resource management guidelines, a description of the existing visual conditions in the project area, and an analysis of impacts associated with implementation of the proposed project. The analysis also includes mitigation measures designed to minimize or avoid impacts to visual resources.

The proposed project is the development of a lift-served bike park on Shadow Mountain Drive in Conifer, Colorado. The project would require tree clearing and grading to construct a base area that includes parking spaces for up to 300 cars, a guest services facility, and the top and bottom terminals of a chairlift, as well as tree clearing along the lift corridor, bike trails, and service road.

Local Guidelines

Local guidelines for the visual resource include the Conifer/285 Corridor Area Plan and the Jefferson County Zoning Resolution.

Community Plan Compliance

The Jefferson County 2020 Comprehensive Master Plan was originally adopted by the Planning Commission in 2010 and updated in 2020. It includes eight area plans that provide more specific guidance when considering rezoning, special use, or site approval. The Conifer/285 Corridor Area Plan applies to the proposed project area and its direction for the visual resource is provided below.

The perception of open space is enhanced by unrestricted views.

The visual resources of the Conifer/285 Corridor Area are among its most important values. Views of the area's beauty attract people to the community and provide pleasure to its residents. These resources should be protected.

1. *Visually sensitive areas, and landscapes that have special qualities, (e.g. major rock outcrops, mountain meadows, steep slopes, ridgelines and peaks) should be treated as environmentally sensitive areas, and New Development in these areas should only be allowed if visual impacts can be adequately mitigated.*
2. *Visual impacts of New Developments in mountain meadows cannot be adequately mitigated through planting trees.*
3. *If a mountain meadow is discovered on a property, which is not already designated on the Plan Recommendation maps, development should be placed outside of mountain meadows. Buildings may be placed at the edge of meadows within the trees; however, the following items should be taken into consideration for this to occur. Density recommendations should not change.*
    a. *Using the natural topography to minimize the visual impacts of the buildings, as much as practicable.*
    b. *Constructing only open-style fencing in the meadow area.*
    c. *Minimize disturbance in the 'wet' portion of the meadow, if such an area exists.*
4. *In addition, the following should be included in the architectural design.*
    a. *Using colors that help the structures blend into the natural surroundings.*
    b. *Using more than one building material. One of the materials used should be stone, faux stone, cultured stone, or timbers.*

    c. *Minimize the impact of other non-building structures on the meadow, such as driveways, septic systems and detention areas.*
5. *Structures, roads and utilities should be designed so they do not visually dominate the landscape. Techniques that should be considered include:*
    a. *Structures should be below the ridgeline, and natural materials and colors should be used;*
    b. *Roads should be constructed parallel to contours, rather than a bold cut on a hillside; and*
6. *Development within activity centers should be designed to achieve a visually cohesive appearance by using natural materials and colors compatible with the mountain backdrop of the area.*[1]

A-2 Zoning

The proposed project would be located on a parcel zoned as Agricultural-Two, or A-2. There are no specific guidelines for the visual resource, however, there are guidelines for building heights and other parameters. They are the following:[2]

Districts	Building Height	Lot Size (see a & b below)
A-1	35 ft.	5 Acre (217,800 s.f.)
A-2	35 ft.	10 Acre (435,600 s.f.)
A-35	35 ft.	35 Acre (1,524,600 s.f.)

Existing Conditions

The existing parcel is undeveloped. It is characterized by slopes from 5 to 25 percent with some steeper areas of rock outcrops. Vegetation consists of mixed conifer, aspen forest, lodgepole pine, agricultural and rocky meadows, as well and some riparian areas and wetlands.[3] Most of the proposed development would occur in a meadow area that was previously cleared of vegetation for agricultural purposes. The area has not been identified by the Conifer/285 Corridor Area Plan as a mountain meadow.

Three viewpoints were selected for analysis in order to simulate the visual impacts of the proposed project. These include two viewpoints along Shadow Mountain Drive, one looking west across the meadow at the development, and one looking directly at the proposed base area development and lift corridor. The third viewpoint is from South Warhawk Road from which the lift corridor would likely be visible. These viewpoints were selected because the local community was concerned about modifications to the visual resource from these particular areas and because they are the most frequented areas with direct views of the proposed project area. Many other viewpoints along Shadow Mountain Drive and South Warhawk Road were considered, however, visibility of proposed projects from most other viewpoints considered would be minimal to none. Refer to Figure 1 for a map of the viewpoints included in this analysis.

[1] Conifer/285 Corridor Area Plan, updated 2020
[2] Jefferson County Zoning Resolution, 2020 Edition, Section 33
[3] Shadow Mountain Bike Park Vegetation Assessment, prepared for this application.

Shadow Mountain Drive passes through the parcel and is on the northwestern edge of the proposed parcel for development. This is the main viewpoint from which visitors to the area can see the parcel (refer to Figure 2a). Most viewers currently see the parcel along an approximately 0.75-mile stretch of road while driving along Shadow Mountain Drive. When driving the posted speed limit of 30 miles per hour, there is an approximately 90 second window in which the project area is visible. In its existing condition, the only built structures on the parcel are a wooden fence and metal posts close to the road, where a stream crosses.

South Warhawk Road stems from Shadow Mountain Drive and travels uphill, across from the project parcel to the northeast. Most visitors in this area are residents. While driving, there are short windows where the trees break and reveal the higher elevation areas within the parcel (refer to Figure 4a). This window of visibility only lasts a couple seconds at a time. In its existing condition, the only built structures in view are houses on the mountain side and communications infrastructure along the ridgeline.

Additionally, there are some private residences bordering the project area that have direct views of the parcel. Adjacent residences include homes on the other side of Shadow Mountain Drive, as well as homes directly adjacent to the parcel. Most viewers at these locations are likely local residents in their homes or on their property. The duration of their view likely lasts anywhere between a couple seconds and several minutes, depending on what they are doing.

Proposed Conditions

Development of the proposed project would introduce developed bike park infrastructure and trails into an area that currently exists in a near natural state. The project would result in modest additions to a largely undeveloped landscape when viewed from critical viewpoints.

Specifically, the proposed development would introduce a road, chairlift infrastructure, a parking lot, and a lodge that would be visible from critical viewpoints. Wildfire treatments in the forest and trail clearing corridors may also be visible. The chairlift would have a clearing corridor of up to 50 feet (as depicted in Figures 3b, 3c, and 4b), trails would be up to 20 feet in width, and the access road would be approximately 30 feet in width with clearing of 10 feet on either side. Additionally, the Wildfire Hazard Mitigation Plan includes treatment areas that would result in thinning of forest stands, removal of underbrush, some patch cutting, and additional clearing around the base area. These treatments and clearing areas are depicted in the simulations.

As illustrated in the visual simulations (Figures 2-4), the proposed base area and parking facilities would be prominent in the foreground of viewpoints 1 and 2 and the chairlift and lift corridor would be prominent in the middleground of viewpoint 3. The service road, clearing areas around the lift terminals, and select bike trails would have some visual impacts by creating some gaps in the forest stands (see Figures 2b and 3b). However, these impacts would be minor as they would primarily be seen as additional shadows in the forest and would be shielded by existing vegetation from most views in the analysis area.

As illustrated in Figures 2b and 3b, implementation of the proposed project would introduce recreation infrastructure to the largely undeveloped landscape along Shadow Mountain Drive. Visual impacts would be most severe in the foreground, where the proposed parking facility, base area facility, and

chairlift/terminal would be viewed by members of the public driving down the road. Given the topography, vegetation, and winding nature of Shadow Mountain Drive, it is anticipated that the proposed base area would only be visible for approximately 90 seconds over a 0.75-mile segment of the road. Project-specific design criteria and best management practices would be utilized to minimize or avoid visual impacts from this viewpoint.

As illustrated in Figure 4b, implementation of the proposed project would introduce recreation infrastructure to the largely undeveloped landscape viewed from South Warhawk Road. Visual impacts would be evident in the middleground, where the proposed chairlift, top terminal, and lift corridor would be visible for members of the public driving down the road. Given the topography, vegetation, and winding nature of South Warhawk Road, it is anticipated that the proposed chairlift infrastructure would occasionally become visible in short windows where the trees break and reveal the higher elevation areas within the parcel. These views are not anticipated to last more than a couple of seconds, and project-specific design criteria and best management practices would be utilized to minimize or avoid these impacts. While the proposed projects would introduce recreation infrastructure to the mountainside, with adherence to PDC, the proposed projects would remain visually subordinate to the visual strength of the characteristic landscape.

It is likely that the residences in the area would also experience the visual impacts of the proposed project. These are the areas from which the views would last the longest. The two residences closest to the project parcel (one across from the parcel and one bordered by the project parcel along Shadow Mountain Drive) would have the most direct views of the proposed base area development. The character of their viewscapes would change from largely undeveloped to developed.

Mitigation Measures

As demonstrated in Figure 3c, vegetation would be planted and clustered along the edge of the parking lots strategically to screen the base area facility, lift terminal, and bike park activity. While these are not considered mitigation according to the Conifer/285 Corridor Area Plan, they would provide screening of the development for drivers along Shadow Mountain Drive and for the nearby residences.

The planned base area facility would also follow design criteria to mitigate its presence in the viewshed of Shadow Mountain Drive. The building would be nestled into the hillside, minimizing vertically into the majority of the facades. Maximum building height is currently designed at 32’6”, compliant with the A-2 building height limit of 35’. The roof planes would be sloped to match the grade of the hillside and ‘replace’ the hillside that was removed, so one’s eye naturally connects the rooflines into the mountainside. Although an exact material palette has not been selected at this point, the building facades will be comprised of natural materials and tones of grey, brown, and black (see Figures 2b and 3b). Utilizing wood, stone, concrete, and steel allows the building to blend into the shadows and trunk lines of the forest surrounding it.

Viewshed Analysis

The viewshed of the proposed project is displayed in Figure 5. This viewshed was analyzed from the highest point within the parcel, from the proposed top lift terminal. As described in the figure, the viewshed displays a 10km (approximately 6.22 mile) radius, where green indicates areas from which the viewpoint would be visible.

The viewshed from this point is primarily visible north and west of the project area. It is likely that the areas further away would have trouble seeing a lift terminal given the presence of vegetation and the scale of it from a distance. This being said, it is likely that the viewshed areas that would be most highly impacted are those closest to the project area.


Shadow Mountain Dr
S Warhawk Rd
Shadow Mountain Dr
3
2
1
Shadow MOUNTAIN BIKE PARK
VISUAL ANALYSIS
Figure 1: Viewpoint Locations
LEGEND
Viewpoints
Viewing angle
Project Area
Prepared by:
SE GROUP
N
Scale (ft)
0
600

VISUAL ANALYSIS
Figure 2a: Viewpoint 1
Shadow Mountain Drive
Existing Conditions

Shadow MOUNTAIN BIKE PARK

Prepared by:
SE GROUP
and
Perkins&Will

VISUAL ANALYSIS
Figure 2b: Viewpoint 1
Shadow Mountain Drive
Proposed Conditions

Shadow MOUNTAIN BIKE PARK

Prepared by:
SE GROUP
and
Perkins&Will

VISUAL ANALYSIS
Figure 3a: Viewpoint 2
Shadow Mountain Drive
Existing Conditions

Shadow MOUNTAIN BIKE PARK

Prepared by:
SE GROUP
and
Perkins&Will

VISUAL ANALYSIS
Figure 3b: Viewpoint 2
Shadow Mountain Drive
Proposed Conditions

Shadow MOUNTAIN BIKE PARK

Prepared by:
SE GROUP
and
Perkins&Will

VISUAL ANALYSIS
Figure 3c: Viewpoint 2
Shadow Mountain Drive
Proposed Conditions (mitigated)

Shadow MOUNTAIN BIKE PARK

Prepared by:
SE GROUP
and
Perkins&Will

VISUAL ANALYSIS
Figure 4a: Viewpoint 2
South Warhawk Road
Existing Conditions

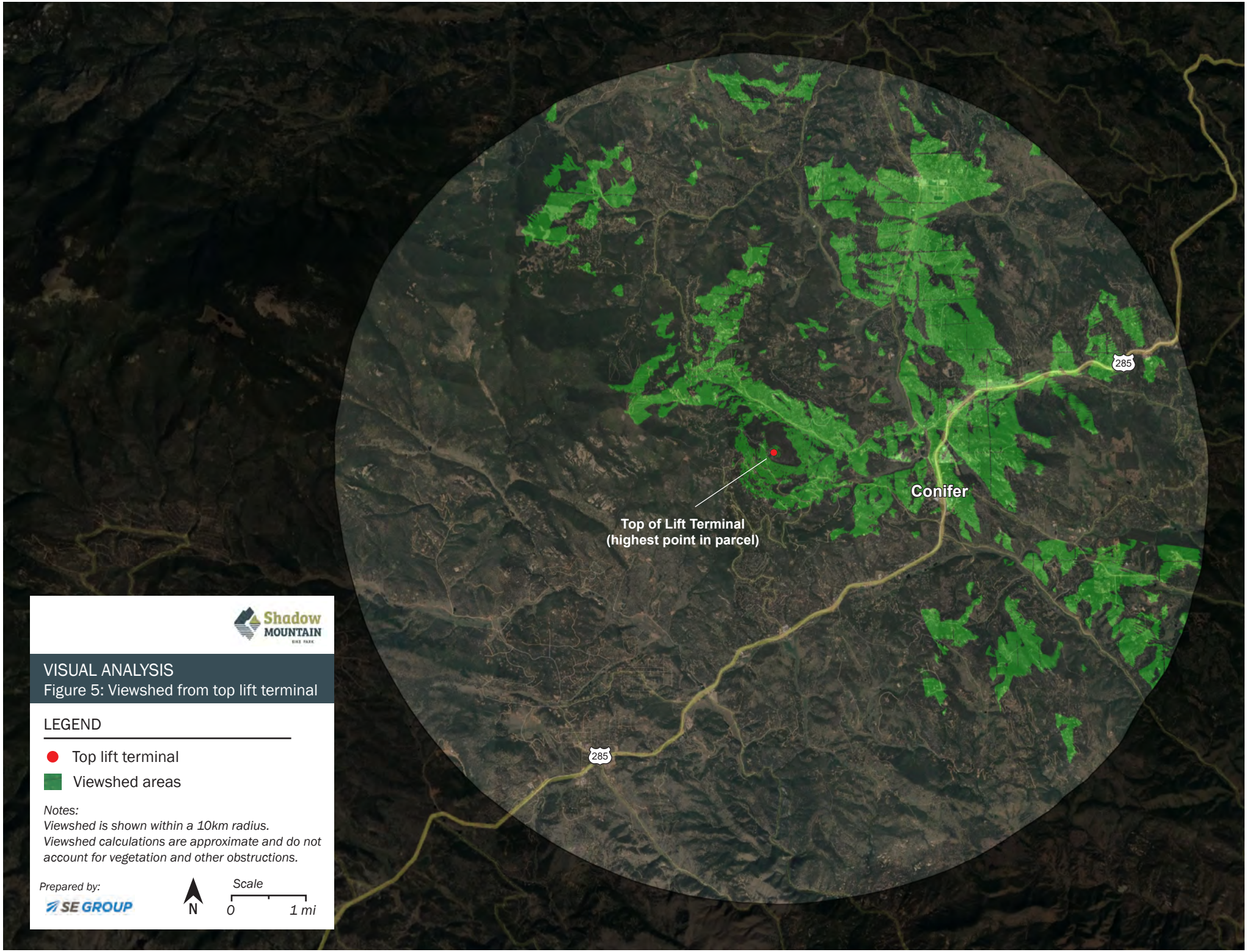
Shadow MOUNTAIN BIKE PARK

Prepared by:
SE GROUP
and
Perkins&Will

VISUAL ANALYSIS
Figure 4b: Viewpoint 2
South Warhawk Road
Proposed Conditions

Shadow MOUNTAIN BIKE PARK

Prepared by:
SE GROUP
and
Perkins&Will



Shadow MOUNTAIN BIKE PARK

VISUAL ANALYSIS

Figure 5: Viewshed from top lift terminal

LEGEND

- Top lift terminal
- Viewshed areas

Notes:
Viewshed is shown within a 10km radius.
Viewshed calculations are approximate and do not account for vegetation and other obstructions.

Prepared by:
SE GROUP

N

Scale
0 1 mi

WILDFIRE MITIGATION MANAGEMENT LEGEND:

- UNIT A - APPROX 7.5 AC MIXED CONIFER & PONDEROSA PINE
- UNIT B - APPROX 10.5 AC MIXED CONIFER & SPRUCE-FIR
- UNIT C - APPROX 14 AC MIXED CONIFER, SPRUCE-FIR, & PONDEROSA PINE
- UNIT D - APPROX 7.5 AC LODGEPOLE PINE, SOME FIR
- UNIT E - APPROX 12 AC MIXED CONIFER W/ ASPEN
- UNIT F - APPROX 5 AC MIXED CONIFER W/ ASPEN
- UNIT G - APPROX 3.5 AC MIXED CONIFER W/ ASPEN
- UNIT H - APPROX 1.25 MI ROAD

VEGETATION TO BE REMOVED MIN 10' EITHER SIDE OF ACCESS ROAD CL. CLEARING MAY EXTEND BEYOND 36' CLEARING CORRIDOR DEPENDING ON FINAL ROAD ALIGNMENT AND DESIGN, TYP

VEGETATION TO BE REMOVED 20' EITHER SIDE OF LIFT CL. SELECTIVE CLEARING TO EXTEND 10' FROM 40' CLEARING CORRIDOR, TYP

DEVELOPMENT OF MAINTENANCE AREA TO REQUIRE CLEARING WITHIN FACILITY FOOTPRINT. FINAL FOOTPRINT CONTINGENT ON FINAL AREA DESIGN.

ADDITIONAL CLEARING MAY BE REQUIRED PENDING CHAIR LIFT ENGINEERING AND CONSTRUCTION. FOR EXAMPLE, ADDITIONAL CLEARING MAY BE NECESSARY TO CONSTRUCT ACCESS ROAD(S) TO TOWER LOCATIONS FOR TOWER EXCAVATION. FINAL CLEARING LIMITS FOR CHAIR LIFT TO BE DETERMINED UPON ENGINEERING OF THE CHAIR LIFT, TYP

DEVELOPMENT OF BASE LODGE AND PARKING FACILITIES TO REQUIRE CLEARING WITHIN FACILITY FOOTPRINT. EXISTING VEGETATION ALONG SHADOW MNT DR FRONTAGE AND WITHIN WETLAND AND RIPARIAN AREAS TO BE PRESERVED AND PROTECTED TO THE GREATEST DEGREE FEASIBLE. PRIORITY ON PRESERVING EXIST HEALTHY ASPENS.

40'
30'
36'
60'

CONIFER

N TURKEY CREEK
SHADOW MOUNTAIN DRIVE
S WARHAWK RD

GENERAL NOTES:

1. WILDFIRE MITIGATION PROVIDED BY THE SHADOW MOUNTAIN BIKE PARK WILDFIRE MITIGATION HAZARD PLAN DATED NOV 2023 PREPARED BY THE EMBER ALLIANCE. MITIGATION PRACTICES TO FOLLOW THE MITIGATION.
2. THE FOLLOWING SHALL BE PRESERVED AND PROTECTED WHERE PRACTICABLE:
   - 2.1. HEALTHY TREES OVER 6" IN CALIPER IN THE PLAINS AND 8" IN THE CALIPER IN THE MOUNTAINS, MEASURED 4.5 FEET ABOVE FINISHED GRADE;
   - 2.2. VEGETATION, NOT INCLUDING TREES, OVER 8 FEET IN HEIGHT;
   - 2.3. MATURE CLUSTERS OR STAND OF HEALTHY TREES OR SHRUBS;
   - 2.4. HEALTHY TREES AND VEGETATION IN RIPARIAN, WETLAND, AND CRITICAL WILDLIFE AREAS.
3. THIS OVERALL PRESERVATION PLAN IS CONCEPTUAL IN NATURE. FINAL LOCATION AND DESIGN OF SITE DESIGN COMPONENTS INCLUDED HEREIN (E.G. TRAILS, CHAIRLIFT, INTERNAL ROADS, BUILDINGS) SHALL BE FINALIZED AT THE SITE DEVELOPMENT PLAN PHASE.

LEGEND:

- EXIST CONTOURS
- PROPERTY LINE
- WETLANDS & STREAMS
- VEGETATION CLEARING AREA

0 200' 400'
GRAPHIC SCALE: 1" = 200ft
CONTOUR INTERVAL: 5'

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SHADOW MOUNTAIN BIKE PARK

CONIFER, COLORADO

Not For Construction

ISSUE
SCHEMATIC DESIGN

RELEASE DATE
December 23

REVISIONS

PROJECT NO.	22089001
MADE BY	OD
REVIEWED BY	AP

OVERALL VEGETATION PRESERVATION PLAN

VEG

Shadow Mountain Bike Park Sensory Impact Assessment - Noise

Final Report

December 8, 2023

Prepared for:
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Limitations and Sign-off

The conclusions in this report Titled Shadow Mountain Bike Park Sensory Impact Assessment – Noise, 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 SE Group (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.

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Abbreviations

dB	Decibel
dBA	Decibel (A-weighted)
GA	Ground absorption
Hz	Hertz
ISO	International Standards Organization
L_{eq}	Equivalent continuous sound level
L_{0}	Sound level exceeded for 0% of the time
L_{10}	Sound level exceeded for 10% of the time
L_{25}	Sound level exceeded for 25% of the time
L_{50}	Sound level exceeded for 50% of the time
L_{90}	Sound level exceeded for 90% of the time
L_{max}	Maximum sound level
L_{min}	Minimum sound level
LDR	Land Development Regulations
SIA	Sensory Impact Assessment
SLM	Sound level meter
SMBP	Shadow Mountain Bike Park

Executive Summary

The SE Group has retained Stantec Consulting Services Inc. (Stantec) to complete a Sensory Impact Assessment (SIA) to evaluate noise impacts generated by the proposed Shadow Mountain Bike Park (SMBP). The proposed location of the SMBP is along Shadow Mountain Drive in Conifer, Jefferson County, Colorado (the Site). The proposed SMBP will consist of a downhill mountain bike park with lift services, 320 parking spaces, a day lodge building, and a maintenance building.

This SIA was completed in accordance with the requirements of the Jefferson County Colorado Land Development Regulation (LDR), amended December 6, 2022, which requires that proposed Developments not create sensory impacts including noise, odor, and visual impacts at nearby sensitive receptors such as parks, schools, or residentials buildings. The scope of this SIA is limited to the evaluation of the impacts of noise resulting from the operation of the proposed SMBP only.

Operational noise from the SMBP was modelled using CADNA/A acoustic modelling software (version 2021 MR2) published by Datakustik GmBH, configured to implement ISO-9613-2 environmental noise propagation algorithms. Operational noise sources from Stantec's database were used for this assessment as final equipment selections and final design of the SMBP have yet to be completed at the time of writing of this report.

Stantec recommends that this study be updated when final design of the SMBP is complete to validate the assumptions of this SIA.

Predicted sound levels indicate that the noise generated by the proposed SMBP at nearby noise sensitive areas and highest impacted/worst case property line locations is below the applicable daytime and nighttime noise limits for nearby residential receptors. The results of this SIA demonstrate that the SMBP is expected to comply with the Jefferson County LDR noise limits.

1 Introduction

The SE Group has retained Stantec Consulting Services Inc. (Stantec) to complete a Sensory Impact Assessment (SIA) to evaluate noise impacts generated by the Shadow Mountain Bike Park (SMBP). The proposed location of the SMBP is along Shadow Mountain Drive in Conifer, Jefferson County, Colorado (The Site). The proposed SMBP will consist of a downhill mountain bike park with lift services, 320 parking spaces, a day lodge building, and a maintenance building.

This SIA was prepared in accordance with Section 26 of the Jefferson County Land Development Regulations (LDR) amended December 6, 2022.

Figure A.1 included in **Appendix A** shows the location of the Site.

2 Noise Terminology

Sound is caused by vibrations that generate waves of minute pressure fluctuations in the surrounding air. Sound levels are measured using a logarithmic decibel (dB) scale. Human hearing varies in sensitivity for different sound frequencies, and the frequency sensitivity changes based on the overall sound level. The ear is most sensitive to sound at frequencies between 800 and 8,000 hertz (Hz) and is least sensitive to sound at frequencies below 400 Hz or above 12,500 Hz. Consequently, several different frequency weighting schemes have been used to approximate the way the human ear responds to various frequencies at different sound levels. The A-weighted decibel, or dBA, scale is the most widely used for regulatory requirements, as it discriminates against low frequency noise similar to the response of the human ear at the low to moderate sound levels typical of environmental sources. Sound levels without a frequency weighting applied, referred to as unweighted or linear, are generally reported as dB or dBZ.

The sound power level (PWL or L_w) of a noise source is the strength or intensity of noise that the source emits regardless of the environment in which it is placed. Sound power is a property of the source, and therefore is independent of distance. The radiating sound power then produces a sound pressure level (SPL or L_p) at a point of which human beings can perceive as audible sound. The sound pressure level is dependent on the acoustical environment (e.g., indoor, outdoor, absorption, reflections) and the distance from the noise source. Unless otherwise stated, sound levels in this report are sound pressure levels.

Numerous metrics and indices have been developed to quantify the temporal characteristics (changes over time) of community noise. The equivalent continuous sound level, L_{eq}, metric is the level of a hypothetical steady sound that would have the same energy as the fluctuating sound level over a defined period of time. The L_{eq} represents the time average of the fluctuating sound pressure level. The maximum and minimum sound levels, or L_{max} and L_{min}, are the loudest and quietest instantaneous sound levels occurring during a period of time. The L_{max} is particularly useful for evaluating loud, impulsive noise events.

Other statistical metrics useful to understanding environmental sound levels include the n-percent exceedance sound percentile levels, or L_n. This report includes the L_{25} metric, or the noise level that is exceeded 25% of the time and the L_0 which is the sound level exceeded 0% of the time. The L_0 can be considered equivalent to the L_{max} or maximum sound level. The L_{10} can be approximated as the sound level between L_{max} and L_{25}.

A change in sound levels of 3 decibels is generally considered to be the threshold of perception, whereas a change of 5 decibels is clearly perceptible, and a change of 10 decibels is perceived as a doubling or halving of loudness.

3 Facility Description

The proposed SMBP will consist of a four-passenger chairlift to transport guests and bikes to the top terminal area for gravity flow and downhill trails. The SMBP will operate during daytime hours, as defined by Section 26 of the Jefferson County LDR, between 7 a.m. to 7 p.m. The chairlift will require one terminal in the base area and the terminal area at the top of Shadow Mountain. Chairlift construction will require a 40-foot-wide corridor to accommodate the associated infrastructure. The corridor will be cleared during the construction phase of the project. The chairlift will require power at the bottom and top terminal areas as well as communication lines along the lift infrastructure.

The SMBP will provide approximately 16 miles of trails with varying levels of difficulty. Trails will be constructed of earth, wood, steel, and other materials. All trails will be setback a minimum of 50 feet from property lines.

Parking for approximately 300 guest vehicles will be provided near the base area using the access road along Shadow Mountain Drive. A day lodge will be constructed in the base area of the SMBP to provide guest services including indoor seating, ticketing, restrooms, changing rooms, bike and equipment rentals, and outdoor guest space and seating. Water will be supplied by a commercial water well and sewage will be handled by an onsite wastewater system.

There will be no permanent kitchen space in the day lodge. To address the food and beverage needs of guests, food truck vendors will be brought on site during operational hours.

A maintenance building will be constructed along the maintenance access road for facility operations. Parking for approximately 20 employees will be provided adjacent to the maintenance building.

4 Noise Sources

Based on the facility description, the primary sources of noise from the SMBP are assumed to be the following:

- Chairlift terminals at the base area and top of Shadow mountain.
- HVAC equipment at the day lodge, maintenance building, and chairlift buildings.
- Vehicle noise from movements in the parking lot.
- Vehicle noise along the maintenance road from the maintenance shop to the mountain top.
- Speakers near the day lodge outside dining area.
- A food truck idling adjacent to the day lodge.

The primary noise sources expected to operate at the proposed SMBP are consistent with the definition of steady state or quasi steady state impulsive sound. Steady state or quasi steady state impulsive sound can generally be defined as a sequence of impulsive sound emitted from the same source having a time interval of less than 0.5 seconds between successive impulsive sounds. Impulsive sound can be generally defined as a single pressure pulse or a single burst of pressure pulses with a time interval of equal or greater than 0.5 seconds. Examples of impulsive sound can include dump truck gate banging or impact pile driver operation.

Other potential sources of noise on site such as human or electric powered mountain bikes travelling along the proposed SMBP trails or noise along the chairlift line are assumed to have an insignificant impact to nearby sensitive noise receptors.

5 Noise Sensitive Areas

Noise sensitive areas (NSAs) were identified around the SMBP based on a review of satellite imagery and zoning. Thirteen NSA locations were selected to evaluate the noise impact from steady state noise SMBP sources at residences. Five (5) additional locations were selected near the property lines of the Site as representative worst-case locations. Property line locations were assessed 25 feet from the property limits of the proposed SMBP consistent with the evaluation requirements of the Jefferson County LDR. A summary of NSAs is provided in **Table 5.1**. A location map of NSAs is included as **Figure A.2** in **Appendix A**. A zoning map for the area surrounding the site is included as **Figure A.3** in **Appendix A.**

Table 5.1: Noise Sensitive Location Summary

Noise Sensitive Area ID	Description and Approximate Street Address[1]	UTM NAD 83 Coordinates		
		Zone	Easting	Northing
NSA01	Residence at 30812 Shadow Mountain Drive	13S	469462	4376303
NSA02	Residence at 10188 Christopher Drive	13S	469795	4375463
NSA03	Residence at 10178 Christopher Drive	13S	469781	4375299
NSA04	Residence at 10218 Christopher Drive	13S	469621	4375781
NSA05	Residence at 29795 Kennedy Gulch Road	13S	470473	4374826
NSA06	Residence at 30241 Shadow Mountain Drive	13S	470491	4376172
NSA07	Residence at 29611 Shadow Mountain Drive	13S	470742	4375981
NSA08	Residence at 29365 Kennedy Gulch Road	13S	471070	4375165
NSA09	Residence at 30772 Shadow Mountain Drive	13S	469711	4376453
NSA10	Residence at 30192 Shadow Mountain Drive	13S	470205	4376076
NSA11	Residence at 29455 Kennedy Gulch Road	13S	470684	4374893
NSA12	Residence at 29405 Kennedy Gulch Road	13S	470988	4374980
NSA13	Residence at 29152 Shadow Mountain Drive	13S	471269	4375568
NSA14	25 ft. from West Property Line	13S	469810	4375391
NSA15	25 ft. from North Property Line	13S	470170	4376056
NSA16	25 ft. from North East Property Line	13S	470456	4376057
NSA17	25 ft. from East Property Line	13S	470525	4375820
NSA18	25 ft. from East Property Line	13S	470523	4375937

1 All residences conservatively assumed to be two-story residences.

6 Assessment Criteria

The December 6, 2022, revision of the Jefferson County, Colorado LDR regulates the development of lands in the County with consideration given to protecting land, environment, and natural resources. Section 26 of the LDR regulates sensory impacts from a Development which can include noise, odor, and visual impacts. This assessment is limited to assessing the noise impact of the proposed SMBP.

The applicable criteria for the project under Section 4, Subsection A is:

> *"Noise generated from the proposed development shall not exceed the dBA levels set forth in Section 25-12-103, C.R.S. or as may be amended from time to time. The dBA levels are depicted in the dBA Table: (reloc. 7-12-05; am. 4-4-06)"*

The table referenced in the LDR is provided as **Table 6.1**.

Table 6.1: Jefferson County LDR Noise Criteria[1]

dBA Table					
Time	**7 a.m. to 7 p.m.**	**7 a.m. to 7 p.m.**	**7 a.m. to 7 p.m.**	**7 p.m. to 7 a.m.**	**7 p.m. to 7 a.m.**
Frequency	**L_{25}**	**L_0**	**Periodic/Impulsive**	**L_0**	**Periodic/Impulsive**
Park/School, Residential	55	65	50	50	45
Commercial	60	70	55	55	50
Light Industrial	70	80	65	65	60
Industrial	80	90	75	75	70

[1] Source Jefferson County Colorado Land Development Regulation December 2022

The area surrounding the proposed SMBP is zoned primarily residential or agricultural with existing residences. Stantec has adopted the steady state (i.e., non-periodic/impulsive) noise limits for residential areas and property line evaluation locations for this assessment. The applicable limits for residential areas are L_{25} of 55 dBA or L_0 of 65 dBA during daytime hours and L_0 of 50 dBA during nighttime hours for steady state noise sources measured 25 ft. from the property limits of the SMBP

The SMBP is not expected to have any significant sources of periodic or impulsive noise and operations will be limited to daytime hours only, with the exception of HVAC units. The L_{10} noise level of a noise source can typically be estimated by adding 3 dBA to the LA_{eq} noise level[1] and, by definition, the L_{25} noise level for a piece of equipment will be lower than the L_{10} noise level. For this study, the L_{25} noise level was conservatively estimated by adding a 3 dBA correction factor to modelled LA_{eq} noise levels. The L_0 noise level, which is higher than both the L_{10} and L_{25}, was conservatively estimated by adding a 6 dBA correction factor to modelled LA_{eq} noise levels. After accounting for these adjustment factors, the applicable LA_{eq} noise limits for this assessment are 59 dBA (65 dBA L_0 - 6 dB) during daytime hours and 44 dBA (50 dBA L_0 – 6 dB) during nighttime hours for residential receptors.

[1] Federal Highway Administration Roadway Construction Noise Model (RCNM) User's Guide. January 2006.

7 Methodology

7.1 Operational Noise Analysis

The proposed SMBP will include several sources of steady state noise as described in **Section 4**. As final equipment selections have not been completed at the time of writing of this report, Stantec has selected representative sound power levels to model the predicted impact of the SMBP.

The representative equipment sound power levels used in the analysis are summarized in **Table 7.1.**

Table 7.1: Equipment Sound Power Levels

Equipment Type	Type	Octave Band Sound Power Level (dB)									Total Sound Power Level (dBA)
		31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz	
Chair Lift Terminal	Leq	73	78	93	90	93	88	96	83	78	98
Vehicle Passby	Lmax	64	59	65	58	55	54	50	45	40	90
HVAC Unit	Leq	85	86	82	78	76	73	69	64	56	78
Truck Idle	Leq	30	94	96	94	88	85	81	78	74	91
Speaker	Leq	86	93	91	86	90	95	91	87	81	98

Table 7.2 summarizes the modelling assumptions used for equipment quantities, operating parameters including speed and operating time, and other modelling parameters.

Table 7.2: Modelling Assumption Summary

Equipment Type	Quantity	Operation Time	Operational Notes
Chair Lift Terminal	2	7 a.m. to 7 p.m.	Operations at the top terminal area and at the base terminal area. Operating continuously during daytime hours only.
Transport Truck	1	7 a.m. to 7 p.m.	One truck per hour along the maintenance road connecting the top terminal to the maintenance building. Speed assumed to be 10 mph and operating during daytime hours only.
HVAC Unit	6	24-hour operation	One HVAC unit at the top terminal chairlift, one at the bottom terminal chairlift, two at the day lodge building, and two at the maintenance building. All operating continuously over a 24-hour period
Truck Idle	1	7 a.m. to 7 p.m.	One food trucks idling along the southwest side of the lodge building operating continuously during daytime hours only.
Speaker	1	7 a.m. to 7 p.m.	One speaker adjacent to the outdoor seating area at the southwest side of the lodge building operating continuously during daytime hours only
Vehicle Parking Noise	241	7 a.m. to 7 p.m.	A worst case 241 vehicles per hour entering and exiting the site in the parking lot area has been assumed.

Noise modeling was completed using the Datakustik CadnaA environmental noise modeling software. The operational noise modeling followed typical modeling standards, input parameters, and assumptions, namely:

- The ISO 9613-2 standard[2] algorithm for outdoor sound propagation was used.
- Ground absorption factor of G=0.8 was used.
- Ground elevations were included in the model using equal height contour lines.
- Meteorology parameters were set to 10 degrees Celsius and 70 percent relative humidity.
- Receptor height of 4.5 m (15 ft.) to be representative of a two-storey residence.
- No sound attenuation from vegetation (foliage) to simulate a worst-case condition when leaves have fallen off trees.
- Meteorological conditions are conducive to sound propagation with all receptors located downwind of all noise sources.

7.2 Construction Noise Assessment

Construction activities related to the Development of the proposed SMBP will occur in phases and generally consist of site preparation including tree clearing and road construction, installation of the chair lift, construction of the lodge, and installation of utilities. Construction activities will typically be limited to daytime only.

In accordance with the Jefferson County Regulatory Policy – Noise Abatement adopted April 24, 2007 (“*Policy No. Part 3, Regulations, Chapter 1, Noise, Section 1”)* construction activities are subject to the noise limits summarized in **Table 7.3**.

Table 7.3: Construction Noise Limits

Time Period	Limits[1]
7 a.m. to 7 p.m.	80 dB(A)
7 p.m. to 7 a.m.	75 dB(A)

[1] Noise limits are applicable 25 ft. from the property line of the Development.

At this stage of the proposed SMBP development, detailed construction phasing including equipment selections and timelines have not been finalized. In general, noise impacts from construction equipment will vary by type, age of equipment, overall condition, and operators. During construction of the proposed SMBP, noise from construction activities may be audible at nearby sensitive receptors; however, not all construction equipment required for the construction of the SMBP will be operating at the same time. Additionally, activities will be spread across the Project area and be temporary in duration which will reduce the overall noise impact of construction activities.

[2] ISO 9613-2: 1996. Acoustics – Attenuation of sound during propagation outdoors. Part 2: General method of calculation.

The minimum setback distance of noise sensitive areas identified in **Section 5** is approximately 200 feet from major project components such as the chairlift, parking lot, and day lodge. A summary of representative noise levels for anticipated construction equipment is provided in Table 7.4 at 50 ft. Maximum sound levels from equipment is expected to below the applicable construction noise limits identified in **Table 7.3**; however, Stantec recommends that the construction equipment list and setback distances be reviewed and confirmed prior to construction.

Table 7.4: Construction Equipment Noise Levels[1]

Equipment	Noise Level at 50 feet from Source (dBA L_{max})	Noise Level at 200 feet from Source (dBA L_{max})
Bulldozer	85	73
Crane	85	73
Chainsaw	85	73
Excavator	81	69
Front end loader	79	67
Concrete batch plant	83	71
Drill Rig Truck	79	67
Grader	85	73
Haul/Dump Truck	84	72
Flat Bed Truck	74	62
Pneumatic Tools	85	73
Backhoe	80	68

[1] Source: Federal Highway Administration Roadway Construction Noise Model (RCNM) User's Guide. January 2006.

7.2.1 Construction Noise Mitigation

Construction noise is typically mitigated by implementing best practices such as ensuring construction equipment and associated mufflers are in good working order, limiting the loudest construction activities to daytime hours, using alternative quieter construction methods and/or scheduling work to minimize concurrent use of the loudest equipment, and establishing a noise complaint resolution process. Placement of noise barriers around work sites can be considered for activities in the near vicinity of noise-sensitive land uses.

8 Operational Noise Assessment

Operational noise modelling was completed for the proposed SMBP with the modelling assumptions and methodology outlined in **Section 7.1**. With the exception of HVAC equipment, on-site noise sources will operate during daytime hours only. Due to the varying nature of vehicle passbys as they travel along a modelled path, Stantec has conservatively evaluated vehicle passbys using an L_0 or L_{max} assessment. As all other sources of noise are stationary, they have been evaluated using an LA_{eq} assessment.

Predicted project-generated noise levels at the noise sensitive areas and property lines are summarized in **Table 8.1** for LA_{eq} stationary noise sources. Predicted project-generated noise levels at the noise sensitive areas and representative property line locations are summarized in **Table 8.2** for LA_{max} mobile noise sources. Mobile noise source impacts are as a result of vehicle passbys along the maintenance road and parking lot. The L_{max} is the maximum noise level resulting from a vehicle passby rather than the equivalent energy sound level LA_{eq}.

Table 8.1: Noise Impact Summary Table – LA_{eq} Stationary Noise Sources

Noise Sensitive Area ID	Description	Daytime Project Noise Level (dBA)[1]	Nighttime Project Noise Level (dBA)[1]	Day Limit (dBA)[2]	Night Limit (dBA)[2]	Complies with Limits?
NSA01	Residence at 30812 Shadow Mountain Drive	22	11	59	44	Yes
NSA02	Residence at 10188 Christopher Drive	48	30	59	44	Yes
NSA03	Residence at 10178 Christopher Drive	39	23	59	44	Yes
NSA04	Residence at 10218 Christopher Drive	30	18	59	44	Yes
NSA05	Residence at 29795 Kennedy Gulch Road	19	9	59	44	Yes
NSA06	Residence at 30241 Shadow Mountain Drive	43	25	59	44	Yes
NSA07	Residence at 29611 Shadow Mountain Drive	38	21	59	44	Yes
NSA08	Residence at 29365 Kennedy Gulch Road	24	10	59	44	Yes
NSA09	Residence at 30772 Shadow Mountain Drive	28	18	59	44	Yes
NSA10	Residence at 30192 Shadow Mountain Drive	42	31	59	44	Yes
NSA11	Residence at 29455 Kennedy Gulch Road	25	13	59	44	Yes
NSA12	Residence at 29405 Kennedy Gulch Road	23	11	59	44	Yes
NSA13	Residence at 29152 Shadow Mountain Drive	28	13	59	44	Yes
NSA14	25 ft. from West Property Line	56	38	59	44	Yes
NSA15	25 ft. from North Property Line	42	34	59	44	Yes
NSA16	25 ft. from North East Property Line	56	31	59	44	Yes
NSA17	25 ft. from East Property Line	48	30	59	44	Yes
NSA18	25 ft. from East Property Line	53	30	59	44	Yes

[1] Project noise levels presented as LA_{eq} values.

[2] Day and night noise limits are presented as LA_{eq} values, converted from L_0 criteria using a 6 dBA correction factor as described in Section 0.

Table 8.2: Noise Impact Summary Table - LA_{max} Mobile Noise Sources

Noise Sensitive Area ID	Description	Daytime Project Noise Level (dBA)[1]	Nighttime Project Noise Level (dBA)[1]	Day Limit (dBA)[2]	Night Limit (dBA)[2]	Complies with Limits?
NSA01	Residence at 30812 Shadow Mountain Drive	20	-	65	50	Yes
NSA02	Residence at 10188 Christopher Drive	49	-	65	50	Yes
NSA03	Residence at 10178 Christopher Drive	39	-	65	50	Yes
NSA04	Residence at 10218 Christopher Drive	28	-	65	50	Yes
NSA05	Residence at 29795 Kennedy Gulch Road	27	-	65	50	Yes
NSA06	Residence at 30241 Shadow Mountain Drive	35	-	65	50	Yes
NSA07	Residence at 29611 Shadow Mountain Drive	31	-	65	50	Yes
NSA08	Residence at 29365 Kennedy Gulch Road	19	-	65	50	Yes
NSA09	Residence at 30772 Shadow Mountain Drive	27	-	65	50	Yes
NSA10	Residence at 30192 Shadow Mountain Drive	46	-	65	50	Yes
NSA11	Residence at 29455 Kennedy Gulch Road	26	-	65	50	Yes
NSA12	Residence at 29405 Kennedy Gulch Road	20	-	65	50	Yes
NSA13	Residence at 29152 Shadow Mountain Drive	20	-	65	50	Yes
NSA14	25 ft. from West Property Line	56	-	65	50	Yes
NSA15	25 ft. from North Property Line	56	-	65	50	Yes
NSA16	25 ft. from North East Property Line	64	-	65	50	Yes
NSA17	25 ft. from East Property Line	39	-	65	50	Yes
NSA18	25 ft. from East Property Line	55	-	65	50	Yes

[1] Project noise levels presented as LA_{max} values.

[2] Day and night noise limits are presented as LA_{eq} values, converted from L_0 criteria using a 6 dBA correction factor as described in Section 0.

Project sound levels are predicted to be below the applicable daytime and nighttime noise criteria at nearby sensitive receptors and 25 feet from the property line of the SMBP. Sound level contours at 15 feet above ground are presented in **Figure A.4** and **Figure A.5** for LA_{eq} noise impacts and **Figure A.6** for L_{max} impacts from vehicle passbys in **Appendix A**. The sound level contours illustrate how sound is expected to propagate in the area surrounding the Project and account for the effects of local site topography. The sound level contours show the noise impact is below the applicable limits at nearby receptors and at locations 25 feet from the property line of the proposed SMBP.

9 Conclusion

This sensory impact assessment was completed to evaluate the noise impact of the proposed Shadow Mountain Bike Park the Jefferson County Land Development Regulations. An operational noise model was developed and used to predict the noise impacts of proposed equipment on the Site.

The results of the noise modelling for operational noise predict that noise levels at the nearby sensitive noise receivers will comply with the Jefferson County requirements.

Additionally, construction noise impacts from equipment predicted to be required for the construction of the Shadow Mountain Bike Park are expected to be below the applicable construction noise limits.

This assessment was completed using the preliminary site layout and equipment locations provided by the SE group. Locations of equipment and equipment selection may change and additional construction equipment, not considered in this assessment, such as impact pile drivers may be required during construction. Stantec recommends that this study be updated when final design is completed to evaluate compliance with applicable noise criteria and validate the assumptions made for this assessment.

Appendices

Appendix A Figures

Stantec

Legend

- Site Limits
- Site Limits (2km buffer)

0 0.5 1 km

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Notes

1. Coordinate System:NAD 1983 UTM Zone 13N
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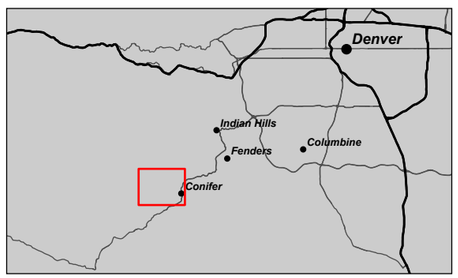


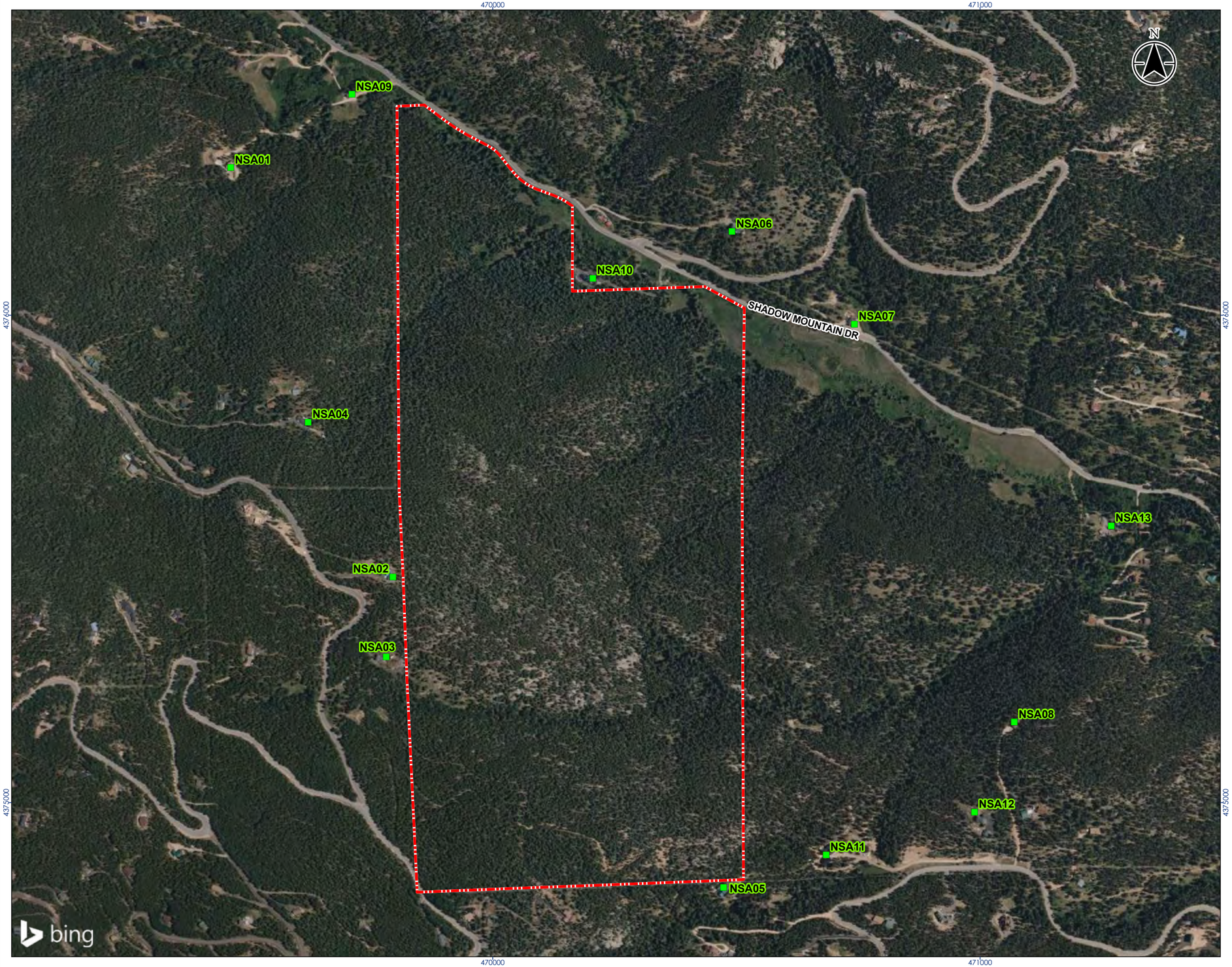
Project Location
Jefferson County, CO

181711248_REVA
Prepared by MDA on 2023-11-30
Technical Review by BCC on 2023-11-30

Client/Project
SE Group
Shadow Mountain Sensory Impact Study - Noise

Figure No.
A.1

Title
Site Plan



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Legend

- Site Limits
- Noise Receptor

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Notes

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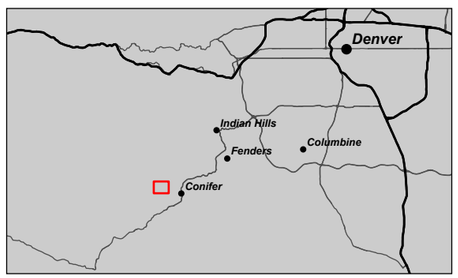

Project Location
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181711248_REVA
Prepared by MDA on 2023-11-30
Technical Review by BCC on 2023-11-30

Client/Project
SE Group
Shadow Mountain Sensory Impact Study - Noise

Figure No.
A.2

Title
Noise Source Plan

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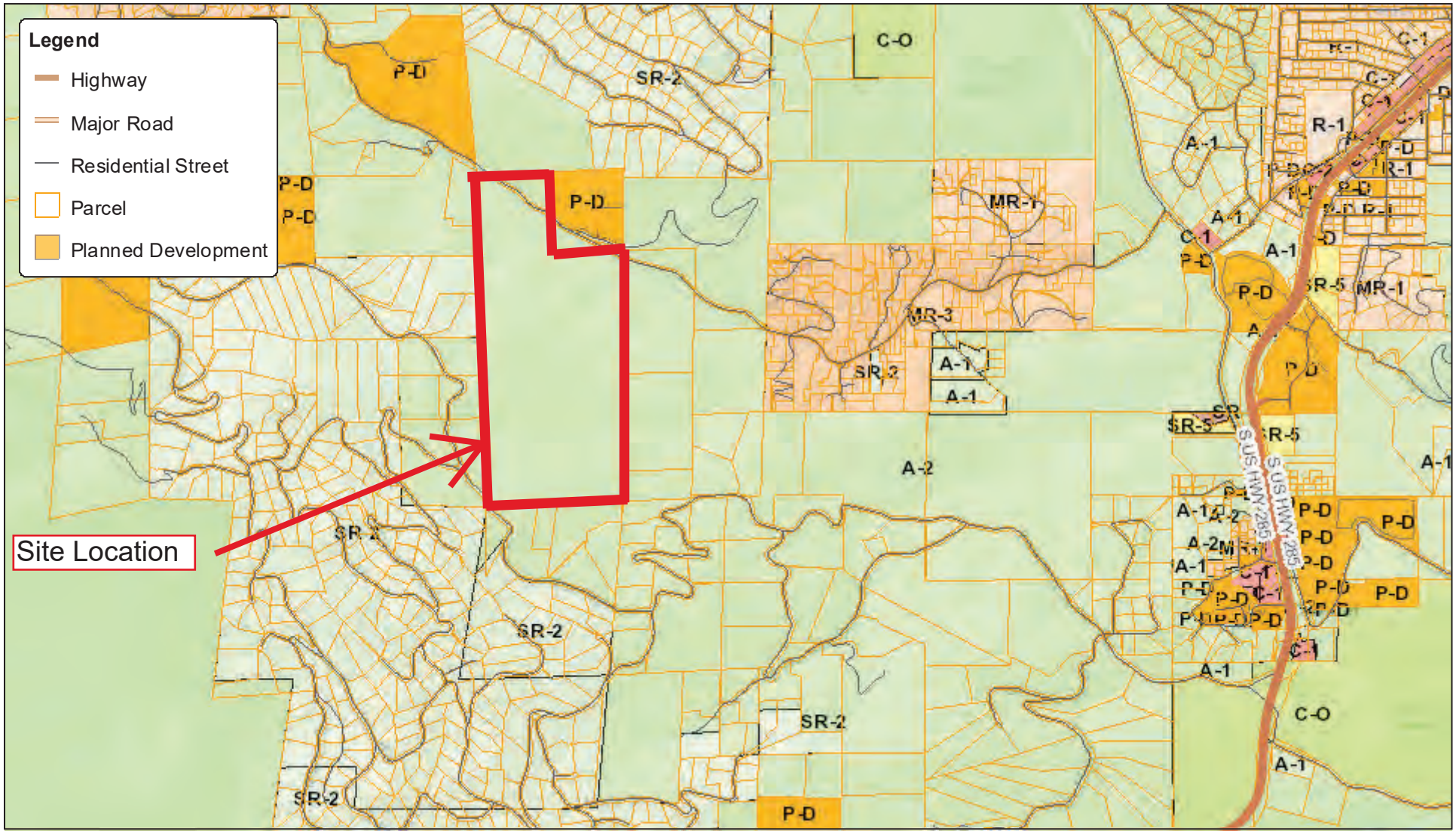
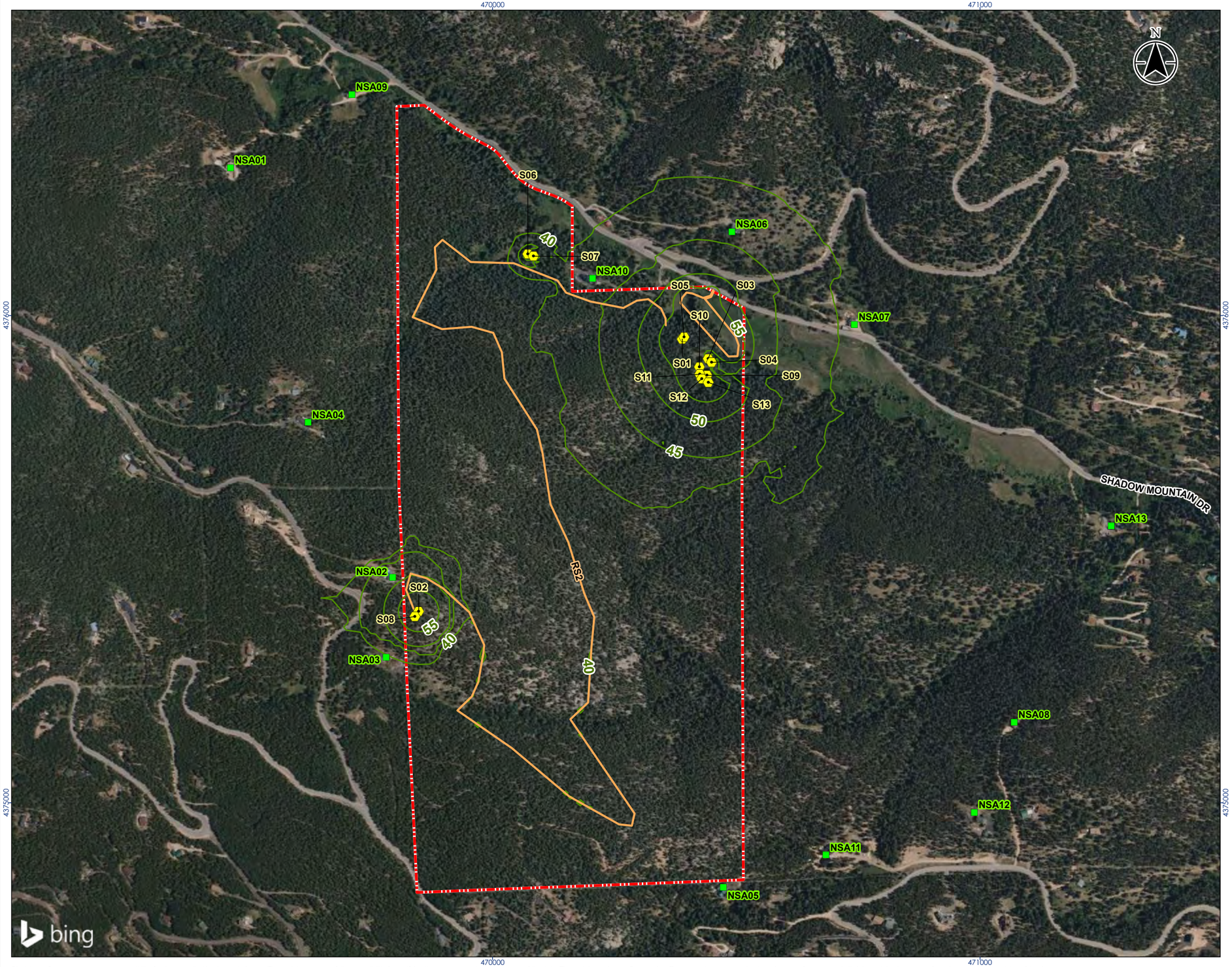
Jefferson County, Colorado



Author: ArcGIS Web AppBuilder
Date: 11/27/2023

Figure A.3 Zoning Map



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Legend

- Site Limit
- Noise Receptor
- Point Source
- Line Source
- Daytime Noise Contour 4.5m (15ft.) AG

0 250 500 m

1:8,000 (At original document size of 11x17)

Notes

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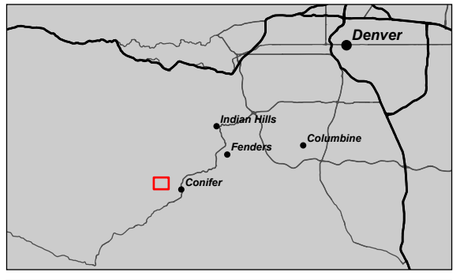


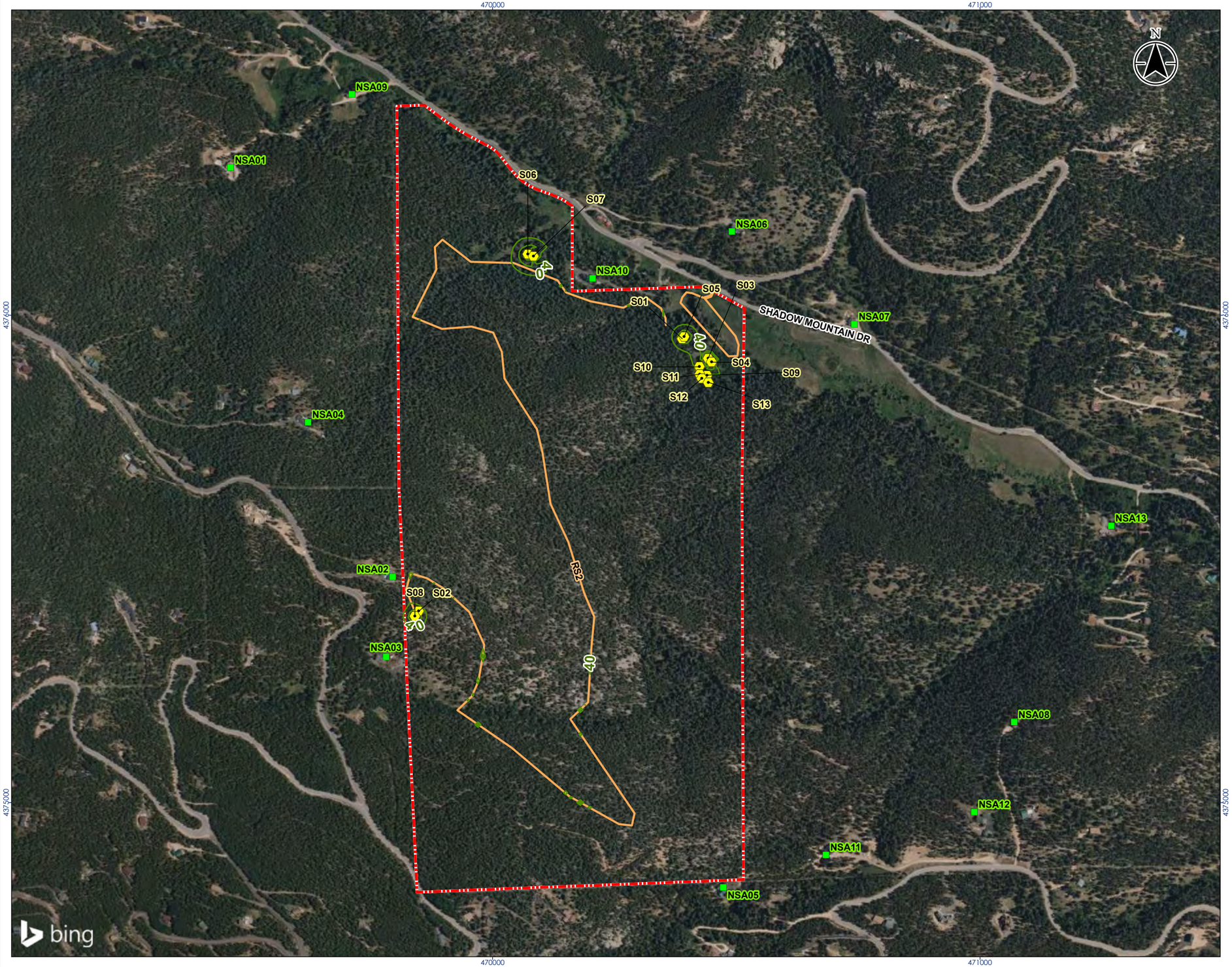
Project Location
Jefferson County, CO

181711248 REVA
Prepared by MDA on 2023-11-30
Technical Review by BCC on 2023-11-30

Client/Project
SE Group
Shadow Mountain Sensory Impact Study - Noise

Figure No.
A.4

Title
Daytime Noise Contour 4.5m (15 ft.) AG



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Legend

- Site Limit
- Noise Receptor
- Point Source
- Line Source
- Nighttime Noise Contour 4.5m (15 ft.) AG

0 250 500 m

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Notes

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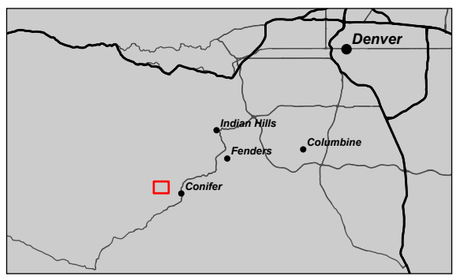


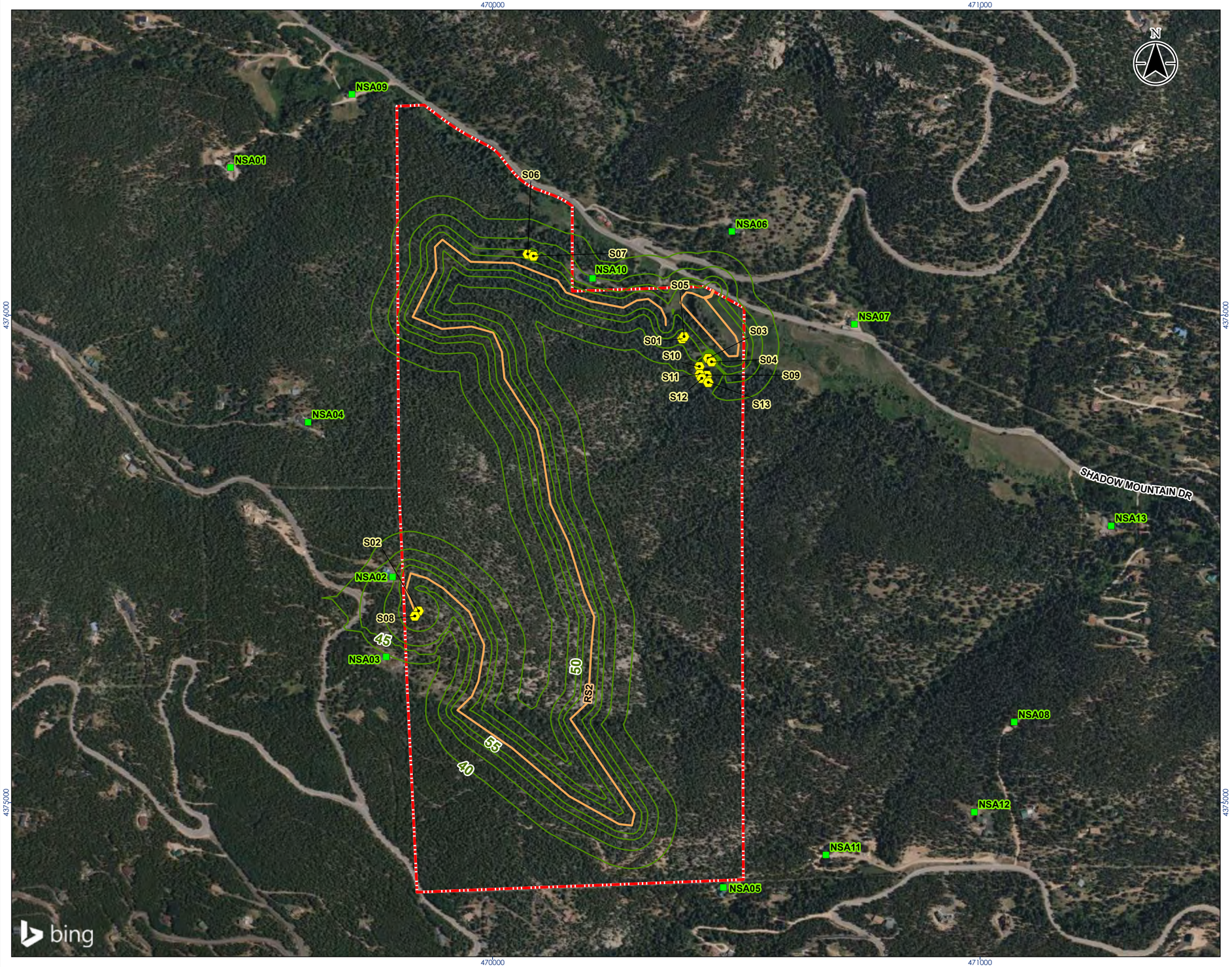
Project Location
Jefferson County, CO

181711248_REVA
Prepared by MDA on 2023-11-30
Technical Review by BCC on 2023-11-30

Client/Project
SE Group
Shadow Mountain Sensory Impact Study - Noise

Figure No.
A.5

Title
Nighttime Noise Contour 4.5 m (15ft.) AG



Stantec

Legend

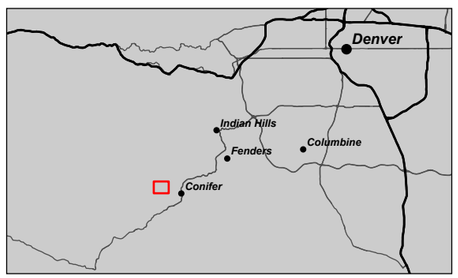
- Site Limit
- Noise Receptor
- Point Source
- Daytime Noise Contour Lmax (dBA)
- Line Source

0 250 500 m

1:8,000 (At original document size of 11x17)

Notes

1. Coordinate System:NAD 1983 UTM Zone 13N
2. Base features produced under creative commons license with the Colorado Department of Transportation © 2022.
3. Orthoimagery © 2023 Microsoft Corporation © 2023 Maxar ©CNES (2023) Distribution Airbus DS



Project Location
Jefferson County, CO

181711248_REVA
Prepared by MDA on 2023-11-30
Technical Review by BCC on 2023-11-30

Client/Project
SE Group
Shadow Mountain Sensory Impact Study - Noise

Figure No.
A.6

Title
Daytime Noise Contour L_{max} (dBA)

December 8, 2023

Jefferson County – Planning and Zoning
100 Jefferson County Parkway, Suite 3550
Golden, CO 80419
Attn: Dylan Monke, Planner

Re: Shadow Mountain Bike Park - Case No. Case No. 23-102980 RZ

Dear Mr. Monke,

We are in receipt of the First Referral Response Letter from Colorado Parks and Wildlife, dated March 21, 2023, as part of the first referral of the application for a special use for the Shadow Mountain Bike Park project (the "**Application**"). We understand that Colorado Parks and Wildlife ("**CPW**") cited concerns related to the impact on wildlife habitat connectivity, which may be negatively impacted by the proposed Shadow Mountain Bike Park. The Applicant acknowledges these concerns and is committed to mitigating potential impacts.

The Applicant has prepared an initial review of wildlife habitat within the project area (as defined in the Wildlife Assessment and which does not include the entire Property acreage), included with the initial application submittal as the Wildlife Assessment. The Wildlife Assessment identifies Elk Winter Range and potential habitat for the Northern Leopard Frog within the project area. Additionally, the Applicant has spoken with CPW to better understand concerns around the proposed project's impacts on wildlife habitat. CPW has also identified the project boundary as including an Elk Winter Concentration Area and an aquatic sportsfish management waters area along North Turkey Creek.

CPW described the Property as functioning as a connection corridor between County open space and National Forest System lands in and around the Conifer area. The Applicant understands that the proposed project could have adverse effects on elk populations that currently rely on the undeveloped Property for habitat. As a result, SMBP proposes the following design and mitigation measures to reduce impacts to wildlife:

- Fencing – Only wildlife-friendly fencing will be used within the Property, as noted in the ODP Written Restrictions.
- Seasonal closure – Shadow Mountain Bike Park will be seasonally closed from January 1 through April 1.
- Construction season – Construction of the proposed project will only occur outside of the elk winter season, from December 1 through April 30.
- Trash management - Only wildlife-proof trash, recycling, and composting containers will be used within the Property, as noted in the ODP Written Restrictions.
- Lighting - No exterior lighting will be permitted outside of the base area and lighting will be directed away from designated wetland areas. These commitments are included in the ODP Written Restrictions.
- Wetlands – Wetlands will remain undeveloped to the greatest extent feasible. The revised ODP Written Restrictions further describe proposed measures.

- The Project is proposed on approximately 235 acres of the 306-acre Property, leaving over 70 acres of the parcel untouched. Within the 235-acre development, over 95 percent of the parcel would have limited infrastructure (only trails, access road, and chairlift).

Additionally, if the Application is approved by Jefferson County, the Applicant commits to working with Jacob Sonberg and the CPW team through the Site Development Process to determine additional mitigation strategies as necessary and further reduce impacts to wildlife where possible.

Sincerely,

Phil Bouchard
Shadow Mountain Bike Park

Jason Evans
Shadow Mountain Bike Park

December 8, 2023

Jefferson County – Planning and Zoning
100 Jefferson County Parkway, Suite 3550
Golden, CO 80419
Attn: Dylan Monke, Planner

Re: Shadow Mountain Bike Park - Case No. Case No. 23-102980 RZ

Dear Mr. Monke,

We are in receipt of the First Referral Response Letter from Jefferson County Historical Commission, dated May 19, 2023, as part of the first referral of the application for a special use for the Shadow Mountain Bike Park project (the "**Application**"). We understand that "[n]o previous cultural resource surveys have been conducted in the project area thus, it is unknown if cultural resources are located there." The Jefferson County Historical Commission recommended that:

1. The applicant needs to consider if the project will impact "historic, archaeological and paleontological resources. Minimally, a current records search of the Colorado Office of Archaeology and Historic Preservation site database is needed. The Conifer Historical Society needs to be consulted to determine if they have additional information about cultural resources in the project area. Finally, with the extent of new infrastructure and bike trails planned for this undeveloped area, JCHC strongly recommends that an on-the-ground survey is the most reliable approach for identifying cultural resources and reducing potential impacts to them.

2. The applicant needs to consider how they can assist in preserving the cultural, historical, and agricultural/ranching heritage of the area.

In response to these recommendations, the Applicant conducted a cultural and historical file search through the Colorado Office of Archaeology and Historic Preservation (see Exhibit A). The search identified 0 sites and 0 surveys within the project area. The Applicant also consulted with the Conifer Historical Society via email on October 10, 2023 and followed up again on October 11 and November 19 to gather more information. The Conifer Historical Society to this date has not provided that applicant with specific information on the parcel, and in this correspondence referenced History Colorado as a resource.

While no sites have yet been documented on the parcel, it is possible that sites do exist within the project area. The Applicant is committed to preserving the integrity of these sites with mitigation measures, including but not limited to:

1. Preparing a Historical, Archaeological, and Paleontological Report or Plan prior to implementation of the proposed project, if requested by Jefferson County Historical Commission or another cooperating agency; and

2. If historical, archaeological and paleontological resources are discovered during site preparation or construction, all construction in the immediate vicinity shall cease and the applicant shall notify the

Jefferson County Planning and Zoning Division and the proper authorities to determine the disposition and necessary protection, excavation, or recovery of the resource(s).

The Applicant understands the importance of preserving historical, archaeological, and paleontological resources and is committed to prioritizing the protection of resources, if present within the project area. If the Application is approved by the County, the Applicant would work with the Jefferson County Historical Commission, the Conifer Historical Society, and other cooperating agencies to fulfill the requirements for this resource, establish mitigation measures where necessary, and continue the project planning accordingly.

Sincerely,

Phil Bouchard
Shadow Mountain Bike Park

Jason Evans
Shadow Mountain Bike Park

Exhibit A

History Colorado

Melanie McKenzie
SE Group

November 1, 2023

Re: Shadow Mountain Bike Park, Case No. 23-102980 RZ
File Search No. 25814

At your request, the Office of Archaeology and Historic Preservation has conducted a search of the Colorado Inventory of Cultural Resources based on your specified search criteria (within the boundary of the provided parcel ID), located in the following areas:

PM	T	R	S
6th	6S	71W	16

0 sites and 0 surveys were located in the search area(s).

If any site, district, building, structure, object, or survey area was identified within the search area, a spreadsheet of detailed information* accompanies this letter. Our records may not represent all cultural resources in Colorado, nor can they be considered comprehensive, as most of the state has not been surveyed for cultural resources. There is the possibility that as yet unidentified cultural resources exist within the proposed impact area.

This letter is not considered formal consultation under Section 106 of the National Historic Preservation Act (36 CFR 800) or the Colorado Register of Historic Places (CRS 24-80.1). In the event that there is federal or state agency involvement, please note that it is the responsibility of the agencies to meet the requirements of these regulations.

We look forward to consulting with you regarding the effect of the proposed project on significant cultural resources in accordance with the Advisory Council on Historic Preservation regulations titled "Protection of Historic Properties" or the Colorado Register of Historic Places, as applicable (http://www.historycolorado.org/consultation-guidance).

If you have any questions, please contact the Office of Archaeology and Historic Preservation at (303) 866-3392. Thank you for your interest in Colorado's cultural heritage.

Dawn DiPrince
State Historic Preservation Officer

*Information regarding significant archaeological resources is excluded from the Freedom of Information Act. As such, legal locations of these resources must not be included in documents for public distribution.

December 8, 2023

Jefferson County – Planning and Zoning
100 Jefferson County Parkway, Suite 3550
Golden, CO 80419
Attn: Dylan Monke, Planner

Re: Shadow Mountain Bike Park - Case No. Case No. 23-102980 RZ

Dear Mr. Monke,

We are in receipt of the Long Range Review Memo from Jefferson County Planning and Zoning, dated May 5, 2023, as part of the first referral of the application for a special use for the Shadow Mountain Bike Park project (the "**Application**"). With this letter, we are providing the following responses to comments received.

I. Key Issues

Land use, wildfire, wildlife, floodplain, light, noise, visual impacts.

Response: Key issues noted.

II. Land Use

1. *The property is located within the Conifer/285 Corridor Area Plan. The properties are within an area recommended for 1 dwelling unit per 10 acres.*

Since this is a Class III Commercial Recreation Facility, it would not fit into the definition of a Community Use. Therefore, the applicant needs to address the three factors outlined below to be considered when a new development is not consistent with the land use recommendations. The applicant did provide a separate document titled "Evaluation for Applications out of conformance with CMP Analysis", however, that document did not specifically address All Development, Policy 3.

1.a *How the impacts associated with the proposed land use(s) will be mitigated compared with the recommended Land Uses;*

- *The recommended land use is 1 du/10 acres. The proposed land use is a Class III Commercial Recreation Facility. Some potential impacts that should be evaluated include wetland areas, floodplains, wildfire, wildlife, visual, light, noise, traffic, water and wastewater.*
- *See appropriate sections below for additional evaluation on each of these items.*
- *The applicant's evaluation of this item is in the Sufficiency Response Letter. They compare the visual impact and water use to the recommended land use of 1 du/10 acres.*

- ***Staff continues to have concerns about how the impacts to wildfire, wildlife, wetlands, visual resources, light, and noise will be addressed.***

Response: The Applicant has produced and/or updated a number of documents to address the concerns herein. These documents are referenced throughout where applicable and are outlined in the "First Referral Response – Summary of Referral Comments – SMBP" document.

Specific to the resources listed above, the Applicant has prepared a Wildfire Hazard Mitigation Plan, included with this resubmittal package, to address wildfire concerns. The Plan has more specific measures outlined to create more defensible space and reduce fuel loads on the Property. Additionally, refer to "First Referral Response – CPW – SMBP" included in this resubmittal package for additional wildlife considerations. Refer to the Visual Analysis included in this resubmittal package for additional analysis of the visual impact of the Project. Refer to the Sensory Impact Assessment included in this resubmittal package for an analysis of noise impacts and mitigation measures.

Additional restrictions for wildfire, wildlife, wetlands, lighting, and noise have been included in the ODP Written Restrictions document included in this resubmittal package as well. These additional reports, restrictions, and mitigation measures are anticipated to reduce the concerns highlighted herein.

1.b *How the proposed land uses are compatible with the surrounding Land Use Recommendations and community character; and*

- *The applicant notes that the current land use recommendation map contains areas of open space adjacent to large lot residential uses. They also note that they are concentrating infrastructure near Shadow Mountain Drive, while buffering the visual impact and will disperse the trail system throughout the property to be shielded from Shadow Mountain Drive. They state that the project will benefit the residences in the area by providing opportunities for improved health and economic growth and that this would offset mountain bike users from other existing areas.*
- *Evaluation of Special Use criteria 1 is in the document provided by the applicant and that criteria also discusses compatibility with existing and allowable land uses in the surrounding area. The applicant's analysis states that the surrounding neighborhoods are single-family dwellings at a moderate to low density. The applicant states that they intent to mirror that dispersed development with limited infrastructure by concentrating infrastructure at the base area and dispersing the trail system throughout the property.*

- ***Staff agrees that open space uses and large lot residential uses are generally compatible. However, most open space parks offer more passive recreational activities, rather than active recreation that is being proposed at this location. While active recreation is also many times compatible with surrounding uses, impacts to adjacent neighbors, due to increased intensity of uses, still needs to be mitigated. Many of the items mentioned throughout the document would increase compatibility of this proposal with surrounding residential uses.***

Response: The Applicant has considered the concerns listed throughout this document and has proposed additional restrictions and mitigation measures in order to reduce the Project's impact on the Property and surrounding uses. These documents are listed in response to each relative comment below.

1.c *What change of circumstance has occurred in the local area since the Land Use Recommendation was adopted.*

- *The applicant notes the increased growth of the front range area since 2010 and that this growth has increased the demand for professionally managed recreation outlets. They state that this growth surpassed the projections in the JCOS 2014-2019 Master Plan and therefore, increased demand was not clear during the original drafting of the CMP.*

- ***Staff appreciates the applicant siting their references to the numbers used to justify the change of circumstance. However, we do not typically accept a change in population growth as a change of circumstance. We look for physical changes to the area, such as an expansion of a road that was not anticipated or a new land use in the area that received approval even though it was out of conformance with the Plan recommendations.***

Response: Noted. The Applicant has adjusted the change of circumstance response as follows:

The Jefferson County Comprehensive Master Plan was originally adopted in 2010 and most recently amended in 2020. Since the original plan adoption, which included the Land Use Recommendations described herein, a number of changes have occurred in Jefferson County and in the Conifer area.

One change of circumstance has been the onset of the COVID-19 pandemic and the recreation challenges that came with it. Trail use increased as residents of the area were

spending more time at home and seeking outdoor activities. This created challenges for management at trailheads and user conflict on trails, which caused the Jefferson County's Open Space department to reconsider their travel management plan and make decisions to better manage and restrict uses. For example, in September 2020, the County established designated use days at Apex Park on select trails, where only mountain bikers are allowed on even calendar days and no bikes are allowed on odd calendar days. These management considerations were a result of heavy use and user conflict, presenting a need for more facilities with designated use.

Additionally, in 2021, the Outside 285 Master Plan was published. This plan was a collaborative, regional planning effort to combine goals on recreation, conservation, and land management around the Highway 285 region. The plan focused on zones within the region, one being the Evergreen/Conifer Zone, in which the Property lies. Objectives for the Evergreen/Conifer Zone, as outlined in the Outside 285 Master Plan, include the following:

Enhance visitor experience and trail opportunities within or adjacent to existing trail systems, including JCOS parks and Staunton State Park.

The Project will be located near a number of JCOS Parks (such as the Flying J Ranch and Meyer Ranch parks) and less than a 10-mile drive from Staunton State Park. It will enhance the recreation experience in the area by providing trails catered to a specific user group (mountain bikers) and providing a recreation experience that does not currently exist outside of the I-70 corridor, which aligns with this objective.

Another objective identified in the Outside 285 Master Plan is to:

Improve capacity and manage conflict in congested areas.

SMBP will provide additional capacity for mountain biking in the area by providing approximately 16 miles of trails and a facility for visitors to the area. Additionally, by being a park for a dedicated user group, it could alleviate some of the user conflict issues experienced on nearby trail systems. SMBP will be providing a trail experience that is already in high demand, which has the ability to alleviate the pressure on these trail systems. The Outside 285 Master Plan specifically calls out the Cub Creek Trail as a mountain biking destination, which is just a 4-mile drive from the Property and specifically attractive to users for its "steep and rugged experience." SMBP will be providing a trail experience that mirrors the steep and rugged terrain in the region while being especially curated for mountain bikes. Additionally, the trails at SMBP would

provide opportunities for all user groups, including beginners, experts, families, and those hoping to improve their skills. By providing additional trails and building upon the existing recreation experience in the area, SMBP would provide capacity and, in doing so, may relieve some of the congestion in surrounding areas, thus meeting this objective.

To address issues of user conflict, the Outside 285 Plan recommended segregating uses. While this is sometimes difficult to enforce on U.S. Forest Service (USFS) trails, a facility such as SMBP will primarily serve mountain bikers, providing a space without user conflict for this user group. Additionally, industry experts have identified that education, events, and community building are important in addressing user conflict issues,[1] and SMBP would support these efforts as a community-oriented and educational space, which has the potential to improve user conflict in the greater area as well.

Lastly, since the Jefferson County Comprehensive Master Plan was amended in 2020, JCOS published the 2022 Forest Health Plan, which includes ten objectives that would be supported by the wildfire treatment areas proposed in this Project. They are outlined specifically in the Wildfire Hazard Mitigation Plan included in this resubmittal package.

2. *The proposed access road is approximately 20-25 feet from the property line and there are trails approximately 18 -20 feet from the property line. The nearest home appears to be approximately 20 feet from the property line. Page 3 of the Proposed written restrictions document states that trails will be setback 30 feet from all property lines. Trails should be setback further from the property line to reduce impacts to adjacent neighbors. While setbacks are listed in the A-2 zone district for structures, there are not for setbacks for other amenities such as trails. This should be added to the proposed written restrictions.* ***We recommend meeting or exceeding the setbacks listed in A-2 for structures or developing a Non-disturbance area along the property boundaries that are adjacent to residences/agriculturally zoned properties.***

Response: Setbacks have been increased to 50 feet as reflected in the revised ODP Written Restrictions.

[1] American Trails 2023, accessed at: https://www.americantrails.org/resources/multi-use-trails-and-conflict

3. *Seasonal closure of facilities is proposed, but the park will still be open to people without lift or lodge access. Does the traffic study compare these two different scenarios? Also, seasonal closure seems a little misleading when the facility isn't entirely closed down. Will there be any staff on site? This definition should be revised. It references guests in the first sentence and visitors in the second sentence, are these one in the same or different?*

   Response: Seasonal Closure has been revised to clarify that guests will not be permitted during the Seasonal Closure, with the exception of guests visiting the Property during a Special Event, if permitted by Special Event Permit. Guests and visitors are one in the same and references to visitors have been removed from the ODP Written Restrictions. Staff may access and use the Property during the Seasonal Closure.

4. *Other entertainment is mentioned in the cover letter? What does that mean? Is the bike park planning on sponsoring live music events? Staff needs to understand what those might be so that we can adequately evaluate their impacts.*

   Response: This reference to "other entertainment" has been removed.

III. Physical Constraints

Slopes

1. There are several areas of slopes over 30% on the property. The applicant did provide a slope analysis and it appears that structures will be constructed in areas with less than 20% slope.

   Response: Noted. Additionally, slopes over 30 percent have been identified as "avoidance areas" and included in the Written Restrictions in this resubmittal package.

Floodplains/Wetlands

2. ***There is a floodplain along North Turkey Creek. That floodplain should be delineated on the Special Use Graphic.*** *The Physical Constraints section contains additional policies about floodplains. (CMP p. 34)*

   Response: Within Jefferson County's jMap online map, the section of North Turkey Creek within the Property does not have a FEMA-identified floodplain but rather a "Jefferson County Flood-Prone Area." This would largely be included within the 50-foot setbacks proposed for this Project, so is not included in the Site Plan.

3. ***Wetlands on the property are shown on the graphic. Those areas should be protected in the graphic and written restrictions. Written restrictions would be needed to explain situations where work would be completed in the wetland areas and what mitigation would occur.*** *The CMP states that "****Wildlife access to wetland should be protected and, where possible, enhanced.****"* ***(CMP p. 35)***

   Response: Wetlands have been identified in the Site Plan as "avoidance areas" and additional restrictions have been included in the ODP Written Restrictions in this submittal package.

Wildfire

4. *Where not in a floodplain, this property appears to be within a High Wildfire Hazard Risk area. A Wildfire Risk Assessment was completed by The Ember Alliance. This report shows that evacuation times in the area may increase from 2.5 hours to 2.75 hours with additional traffic from the bike park and additional information about evacuation of this area. While the CMP does not have specific policies regarding evacuation, it does contain three policies related to access in the Wildfire section. Those discuss creating shaded fuel breaks and linking existing development to New Development to provide multiple access points. Roadway mitigation is an item addressed in the Wildfire Risk Assessment. This property would not provide any road connections to the developments to the south and west.*

   Response: Please refer to the Wildfire Hazard Mitigation Plan for a description of proposed treatment areas to reduce the risk of wildfire, which include shaded fuel breaks and treatments along Shadow Mountain Drive.

   As described in the application narrative included with the initial application submittal, the Applicant has also considered multiple access points to the Property. The base area of the Property is fairly compact and, therefore, does not support providing egress routes on either side of the Project site. While the Project only proposes one way in/out of the Property at this time, the Applicant has considered adding an egress option at the top of Shadow Mountain to evacuate via Conifer Mountain Drive. The access road would be able to connect through a neighboring property into Conifer Mountain Drive. The property owner has agreed and offered this option as an egress route in case of fire. This could be an option in an event where Shadow Mountain Drive cannot be used for egress. The Applicant is open to further discussion and implementation of this option if deemed necessary by County staff.

5. *The report contains recommendations for 4 treatment areas.* ***We recommend adding some of those recommendations to the written restrictions.*** *If this Special Use is approved, some of those recommendations will be addressed at the time of Site Development Plan. How the*

wildfire recommendations should be addressed is noted below. ***The Special Use graphic should identify the 4 treatment areas graphically.***

Response: The referenced report has since been updated. Please refer to the Wildfire Hazard Mitigation Plan. Treatment areas have been incorporated into the Vegetation Preservation Plan and the ODP.

6. *Basecamp:*

6.a *Clearing as much area around the parking lot as possible, while keeping Aspen stands.*

- *This should be addressed in the Special Use document. A non-disturbance area could be graphically shown around the Aspen stands and/or a written restriction could note that Aspen stands should be preserved. The Special Use document should contain a section about Landscaping to note that any landscape plans will be consistent with the recommendations of the Wildfire Risk Assessment*

  Response: This language has been incorporated into the Written Restrictions included in this resubmittal package.

6.b *Prohibit wood fencing.*

- ***The Special Use document should prohibit wood fencing as noted on page 28 of the Wildfire Risk Assessment.***

  Response: This language has been incorporated into the Written Restrictions included in this resubmittal package.

- *Which trees are to be removed would be addressed with the required SDP wildfire mitigation.*

  Response: Comment noted.

7. *Mountain Top:*

- *Heavy clearing around top of lift, preserving Aspen stands and remove all junipers.*
  - *This should be covered with the SDP Wildfire Mitigation required.*

Response: Noted.

8. *Central Trails:*

- *Thinning*
  - *This would be required with the SDP.*

Response: Comment noted.

9. *South End:*

- *Patch cuts of lodgepole*
  - *This would be required with the SDP*

Response: Comment noted.

- *Fencing of aspen to prevent browsing from animals.*
  - ***Note this in the Special Use.***

Response: Noted. Please refer to the Vegetation Preservation Plan included in this resubmittal package, which prioritizes preserving existing healthy aspens. This can be done with measures such as fencing and avoiding aspen stands in areas of development.

10. *There were several recommendations about signage, however, the County cannot dictate the content of signs, so this would need to be addressed by the applicant without County enforcement.*

Response: Comment noted.

11. *Roadway mitigation would be covered by SDP.*

Response: Comment noted.

12. ***As recommended by the Wildfire Risk Assessment, the parking lot should be setback of 300 feet from the property lines. (p. 35)***

Response: The Applicant has considered this feedback and the implementation of a 300-foot setback for wildfire risk. This setback was recommended in order to create a safety zone on the Property in event of a wildfire. As indicated in the Wildfire Hazard Mitigation Plan included with this submittal package, mitigation along Shadow Mountain Drive is recommended instead to provide a safe evacuation corridor in event of a wildfire. This was included in the plan after discussions with both the Elk Creek Fire Protection District (correspondence 8/25/2023) and Road & Bridge (correspondence 9/14/2023), and both agencies were willing to consider this approach. This recommendation would also provide benefits to other residents in the vicinity who would travel along Shadow Mountain Drive in case of an evacuation event.

13. *Slash mitigation would be covered by the SDP.*

Response: Comment noted.

14. *The Elk Creek Fire Protection District's Community Wildfire Protection Plan (CWPP) should be followed.*

14.a *Defensible Space is recommended by the CWPP and is a requirement for any new building permits in the County. Additionally, the applicant has submitted a Wildfire Risk Assessment that contains recommendations as noted above.*

Response: Noted. The Wildfire Hazard Mitigation Plan included with this resubmittal package identifies Management Area G to create defensible space meeting Home Ignition Zone standards as defined by the Colorado State Forest Service.

14.b *The CWPP recommends roadway management with maintenance plans. Roadway treatments on this property along Shadow Mountain Drive should be a part of the Wildfire Mitigation work that is completed with the SDP.*

Response: Noted. This mitigation is also included in the Wildfire Hazard Mitigation Plan included with this resubmittal package.

14.c *The site will be mitigated as outlined in the Wildfire Risk Assessment at the time of Site Development Plan, this should address the section of the CWPP that discusses Stand-level fuel treatments. (p. 52)*

Response: Comment noted.

14.d *This area is within the Conifer Mountain plan unit. It is designated at an extreme relative risk. Measures will need to be taken to reduce that risk. Primary mitigation suggestions include Defensible Space, Create linked defensible space, landscape fuel treatments, home hardening and roadside mitigation. (p. 67) All of these mitigation suggestions can be addressed if the Special Use is approved and the project moves to the SDP process.*

Response: Noted. Additionally, defensible space, landscape fuel treatments, and roadside mitigation are addressed in the management areas identified in the Wildfire Hazard Mitigation Plan included with this resubmittal package.

Wildlife

15. *The majority of the property is within a high wildlife quality habitat area, with portions of the property along the creek being maximum quality habitat areas, due to riparian habitat and wetlands. The Plan recommends avoiding maximum quality habitat areas and reducing impacts to high quality habitat areas.*

The applicant submitted a Wildlife Report. It noted that Elk use the property year-round and that constant use of the bike park would decrease the value to elk and other wildlife.

The Colorado Division of Parks and Wildlife has submitted comments on this proposal and note that the area is used by elk, deer and increasingly by moose. It is also used by mountain lions, bobcats, foxes and coyotes year round. They note that this parcel has important wildlife value and plays an important role in maintaining connectivity of wildlife habitat in an area that is becoming increasingly fragmented by a combination of infrastructure, traffic and growing recreational use.

Response: Comments notes and detailed response to wildlife concerns is addressed in the First Referral Response – CPW – SMBP document.

16. ***There should be restrictions added to address wildlife concerns. All fencing should be wildlife friendly and restricted to specific areas. Perimeter fencing should be prohibited. No lighting should shine into the wetland areas, which are maximum wildlife quality habitat areas. However, even this mitigation may not be enough to mitigate the impacts of this development to wildlife.***

Response: These measures have been considered. Please refer to the First Referral Response – CPW – SMBP document for additional outlined mitigation measures as discussed with the Colorado Division of Parks and Wildlife.

IV. Community Resources

Historic Resources

1. *There are no historic resources identified on this property in the Historic Resources map*.

Response: Comment noted.

Visual Resources

2. *Portions of this property, mainly in the southwest corner are highly visibility from the 285 Viewshed map and the County Hwy 73 Viewshed map.* ***Siting of any improvements in that area will need careful site design to minimize visual impacts.***

Response: Noted; the Applicant understands that this site design will be addressed at the SDP phase.

3. *Additionally, the community identified the meadow along Shadow Mountain Drive as a visual resource.*

Response: Noted and please see response to Comment IV.4 below regarding visual impact mitigation measures.

4. ***The applicant did provide a Visual Analysis of the proposed development. It appears that the most visual impact to Shadow Mountain Drive will come from the lift, lodge and parking lot. Where is the day lodge in this analysis? It appears to be blocked by a tree at the particular vantage point used, what is the impact just east or west of that tree? Additionally, the site plan shows a multitude of trails going through the area and the vegetation plan discusses removing vegetation within 10-15 feet of the centerline of the trails. Please explain how this analysis adequately capture trail impacts. Also, we typically request 5 vantage points for a visual analysis. Additional analysis should be completed in coordination with the Case Manager.***

Response: An updated Visual Analysis has been prepared in coordination with the Case Manager and is included in this resubmittal package. The updated analysis includes an additional viewpoint from further up Shadow Mountain Drive, looking west towards the Property. Additionally, the other two viewpoints have been updated to better reflect the visual impacts of the building, road, trails, and vegetation removal proposed as a result of the Project. The trails and roads will have minimal impacts on visual resources as the vegetation clearing proposed will primarily create additional shadows in the dense forest

cover on the Property. Areas where these impacts would be visible have been included in the visual simulations within the Visual Analysis.

Open Space and Trails

5. *The Conifer/285 Corridor Area Plan contains a section regarding Trails Development (p. 21-Conifer) Policies state:*

5.a *Trails should provide a link throughout the Plan area. Trail design should create trails that:*

i. *Vary in length, gradient and the nature experience;*

- *This proposal would provide a different trail experience than in any other location of the County. It would also provide for beginner through advanced mountain biking terrain.*

Response: Comment noted.

ii. *Link the community, provide wildlife corridors and serve as potential greenbelts;*

- *The park won't link the community.* ***The first page of the Proposed Written Restrictions shows a map and several of the wetland areas are not built on. Those areas should be shown as no build or no disturb areas on the Special Use graphic. Language proposed for a recent rezoning with wetlands included a special use area for the meadow/wetland. The language for that area did allow trails and an access road with additional language. It stated that, "No development can occur in wetlands or wetlands 10 foot buffer except an access road between Light Lane and the site." It went on to state, "An access road may be constructed over the meadow area and wetland area but must have the least impact possible to serve the development in order to preserve meadow and wetland in its' natural state. The impact to the meadow and wetland for the access road is expected to be less than 5% of the meadow area."***

Response: Thank you for providing this example language. Similar language has been included in the Written Restrictions included in

this resubmittal package. Additionally, wetlands have been identified as "avoidance areas" in the updated Site Plan included with this resubmittal package.

- *There is one wetland area that appears to be built over by the parking area. What will be done to mitigate that wetland? There are also paths that go through wetland areas. How will those impacts be mitigated or lessened? We recommend changing the parking location.*

  Response: The Applicant has considered in great detail other locations for parking within the Property and has determined that the proposed parking area would be most beneficial for a variety of reasons, including that it would require the least amount of vegetation removal and grading into the mountainside. Because the Applicant is choosing not to pursue a different parking location, the Applicant is committed to instead reconfiguring their original Site Plan to avoid the existing wetland areas, with the exception of the road crossing into the property. Additional mitigation measures to wetlands are described in the ODP Written Restrictions included in this resubmittal package.

iii. *Provide access for those with special needs and necessary conveyances, where appropriate;*

- *The chairlift will provide access to the mountain biking for those with special needs.*

  Response: Comment noted.

iv. *Traverse diverse landscapes;*

- *The landscapes on this property are relatively uniform, but there are different experiences at the north end vs the south end of the site. The paths on the property will provide access to the entire site.* ***How will the applicant ensure that bicyclists will not create their own paths in the sensitive wetland areas near Shadow Mountain drive?***

Response: Guests would be required to sign a waiver prior to using trails which would commit them to following the rules, regulations, and restrictions of SMBP. This includes staying within the Property boundary and on designated trails/roads. The Project will include a single road into the Property from Shadow Mountain Drive that will serve as the primary ingress/egress for the Property. The convenience of this egress as opposed to crossing a stream (where the wetland area near Shadow Mountain Drive is located) will likely dissuade users from creating new paths as well. Additionally, there will be a number of employees during operating hours that will help with the enforcement of measures such as this one. In addition to these considerations, the Applicant is open to further discussing and implementing mitigation measures if deemed necessary by County staff.

v. *Provide turnouts and access to scenic views and vistas;*

- ***This proposal will provide scenic views and vistas from the top of the lift. Will there be turnout areas along the trails if people need to stop prior to getting to the bottom?***

Response: The Project does not currently include turnout areas on trails solely for the purpose of viewing the scenery; however, there likely would be areas to stop and gather along the trails, including at trail junctions. Additionally, the Applicant may install a bench at the top of the chairlift to encourage access to views and vistas.

vi. *Intersect to allow a choice of routes from a point of origination to various destinations; and*

- *There will be a variety of options from the top of the chairlift and there are choices on some of the proposed trails to take a different route. However, most trails are separated to avoid interactions between beginner and more advanced cyclists.*

Response: Comment noted.

5.b *Avoid areas containing threatened, endangered, sensitive species, or fragile environments.*

- *There are no threatened or endangered species identified as existing or having potential habitat on this site.* ***The floodplain area along North Turkey Creek is a maximum quality wildlife habitat area. See item b. above for potential ways to address the wetlands and floodplain area.***

  Response: Noted, please refer to the First Referral Response – CPW – SMBP and to the ODP Written Restrictions included in this resubmittal package.

5.c *Restrict motorized activities to designated areas*

- ***A Class III Commercial Recreation Facility would allow for motorized activities throughout the site. Since the sound restrictions are not very restrictive, this could potentially allow for a motocross track. The noise impacts from that use would not be acceptable at this site.***

  Response: Noted. Additional restrictions on motorized use have been included in the ODP Written Restrictions document included in this resubmittal package.

Air, Light, Odor and Noise

6. *The Community Resources section contains policies related to Air, Light, Odor and Noise and Recreation and Tourism that should be addressed.*

   Plan policies discuss minimizing light impacts to protect the night sky, avoid pollution, and avoid light or Glare trespass on adjacent properties and Wildlife Habitat. (CMP p. 43)

   Response: Noted. Additional restrictions on lighting have been identified in the ODP Written Restrictions included with this resubmittal package.

7. ***The written restrictions allow lighting, but restrict exterior lighting to before 10 pm in Use Area B. Why is lighting in that Use Area necessary except for lighting required by insurance or regulations? No lighting in Use Area B would better mitigate impacts of the proposal.***

   Response: Noted. Additional restrictions on lighting have been identified in the ODP Written Restrictions included with this resubmittal package.

8. ***Use Area A will need to meet the lighting standards in the Zoning Resolution. Use Area A also contains maximum quality wildlife habitat. Lighting will need to be directed away from the wetlands/floodplains areas and that should be a restriction in both Use Areas A and B.***

   Response: Noted. Additional restrictions on lighting have been identified in the ODP Written Restrictions included with this resubmittal package.

9. ***The Area Plan discourages internally illuminated signs. (Conifer p. 15) Sign lighting is not addressed in the proposed written restrictions. Signs should not be lit.***

   Response: Noted. Additional restrictions on signage have been identified in the ODP Written Restrictions included with this resubmittal package.

10. ***Businesses are encouraged to turn off all non-essential lighting after business hours, leaving only the necessary lighting for site security. (Conifer p. 15) Again, lighting in Use Area B until 10 pm should be justified? Lighting in Use Area A should be reduced to security only after business hours.***

    Response: Noted. Additional restrictions on lighting have been identified in the ODP Written Restrictions included with this resubmittal package.

11. *The Noise policies in the Comprehensive Master Plan discuss the potential noise impacts from hours of operation, mitigating the use of outdoor speakers, amplified music, and/or paging systems where residential uses could be impacted, minimizing noise to maximum/critical wildlife Habitat areas, ensuring noise is reviewed and, if necessary, mitigated and mitigating noise that is annoying, but does not exceed State noise standards. (CMP p. 44)*

    Response: Comment noted.

12. ***What level of noise does the top of the chairlift produce? Will the motor be at the top of the chairlift or the bottom? Will it be electric or diesel? Please provide specs for the lift mechanical equipment so that we can determine whether additional restrictions are needed.***

    Response: A Sensory Impact Assessment has been included in this resubmittal package and includes a noise analysis of proposed facilities included in the Project, including the chairlift.

13. ***The written restrictions state that the sound level shall adhere to the noise levels for Light Industrial uses. Those standards are 15 decibels higher than residential or park standards. Depending on the time of day, this may mean the difference between noise levels related to a conversation and noise***

levels related to busy traffic or an electric vacuum. This does not seem appropriate for this rural residential area. Residential noise standards should be met.

Response: Noted. The ODP Written Restrictions have been updated to reflect this change, and residential noise standards are analyzed in the Sensory Impact Assessment and would be maintained throughout the Property. Both documents are included in this resubmittal package.

14. *As recommended by the Plan, hours of operation have been set. Those are sunrise to sunset, which seems appropriate given the type of use and that this is the restriction on Jefferson County Open Space parks.*

Response: Comment noted.

15. ***Will there be any outdoor speakers, amplified music, and/or paging systems? This should be addressed in the written restrictions.***

Response: Yes, this is described in the Sensory Impact Assessment included in this resubmittal package.

16. ***How will noise be mitigated to the wetlands/floodplain along Shadow Mountain Drive?***

Response: Noise levels will not exceed the standards for residential uses and will be mitigated to the greatest extent possible. Refer to the Sensory Impact Assessment included in this resubmittal package for more information.

17. *The Conifer/285 Corridor Area Plan have additional noise policies related to minimizing noise, considering high noise levels incompatible unless mitigation can decrease the number of noise sources or how the noise is heard, and implementing hours of operation. (Conifer p. 15)*

18. ***Light Industrial noise standards do not seem compatible with this area.***

Response: The Project will adhere to residential noise standards as described in the Sensory Impact Assessment included in this resubmittal package.

V. Infrastructure, Water, & Services

Transportation

1. *The Comprehensive Master Plan discusses ensuring new development has adequate transportation infrastructure to serve it and mitigating negative impacts. Also, how transportation infrastructure and parking areas should balance safety, neighborhood character, and environmental impacts. (CMP p. 48)*

   Response: Comment noted and considered in the First Referral Response - Transportation and Engineering – SMBP included with this resubmittal package.

2. *Additional policies in the Conifer/285 Corridor Area Plan discuss limiting roads to 2 through lanes with appropriate turning, acceleration and deceleration lanes and limiting improvements when they are expensive and would degrade the physical environment. (Conifer p. 29-30)*

   Response: Comment noted and considered in the First Referral Response - Transportation and Engineering – SMBP included with this resubmittal package.

3. *The County's engineers* ***had several comments on the Transportation Analysis provided with this application. Those comments should be addressed in the 2nd submittal.***

   Response: Comment noted and considered in the First Referral Response - Transportation and Engineering – SMBP included with this resubmittal package.

4. *There is no proposed Bicycle infrastructure shown in the Bicycle Plan.*

   Response: Comment noted.

Water and Wastewater

1. *Comprehensive Master Plan policies discuss demonstrating water is adequate and available for the uses proposed, how new development should provide adequate water for firefighting services and how new development served by a well should also be served by a treatment system or facility in the same general area as withdrawal. A key provision in this section discusses how development should be at a scale density consistent with Locally Available Water Resources. Locally Available Water Resources are the surface and ground water that is physically in the watershed sub-basin where the development is occurring, not including water brough in from outside sources such as truck, pipeline, or other means. (CMP p. 49)*

   Response: Information noted.

2. *The applicant provided Water supply cover letter and an engineering study for the water system improvements. The cover letter states that the water will be obtained in two phases. First, an exempt commercial well permit of 0.33 acre-ft per year would be requested. At the same time, the applicant will start the process for a water augmentation plan to supply the facility with 2 acre-ft per year for full build out of the facility. Water will be used for both the facility and for fire sprinkler water. Since water would be coming from a well, it would be from a Locally Available Water Resource.*

   Response: Information noted.

3. *The proposal is situated in the North Turkey Creek Basin of Jefferson County. The letter from the Division of Water Resources states that "the ability for the applicant to obtain well permit(s) and the allowed use(s) will be determined at the time the permit applications are submitted to and reviewed by the State Engineer's Office". With the Pre-application, we had asked if there were water rights available in this basin. It sounds like that would be determined once an application was submitted and reviewed.*

   Response: Noted; it is the Applicant's understanding that water rights would be determined at the SDP phase.

4. *The cover letter discusses that a water storage tank will be constructed to provide for sprinkling of the lodge building. Water for this storage tank would not need to come from the well, but could be hauled in since it would not be used for the water consumed by the lodge.*

   Response: Noted. An additional storage tank is proposed in the Engineering Study for Water System Improvements included in this resubmittal package to provide fire storage demands as defined by the Elk Creek Fire Protection District.

5. *The CMP also discusses how in areas served by an individual or community well, emphasize low water demand uses. (CMP p. 49) This proposal is estimated to use 1,400 gallons per day on approximately 235 acres. Appendix C contains a table of Land Uses with Water Estimates. If this property were built out under the existing A-2 zoning, which has a 10 acre minimum lot size, it could potentially allow for up to 23 residences. According to the Land Uses with Water Estimates table, a single-family detached unit is estimated to use 300 gallons of water per day. That would mean that there could be a total water demand of 6,900 gallons of water per day if built out to the maximum under existing zoning.*

Response: Noted. As described in the Application Narrative included in the initial application submittal, if the Property were developed for residential uses, it would require significantly more water use than the Project.

6. *Sanitation will be provided by an onsite septic system. Where a property is served by well water, the Plan recommends an onsite wastewater treatment facility be used as well to facilitate water recharge. The comments from Jefferson County Public Health estimate that the proposed development would generate 1800 gallons of wastewater per day. That would make the application eligible for an OWTS permit through the County. If the average daily flow is 2,000 gallons per day or more, then a Site Approval process with the Colorado Department of Health and Environment (CDPHE) would be required.*

Response: Information noted.

Utilities and Services

7. ***The power line along Shadow Mountain Drive is proposed to be buried, which would comply with the policies in the Plan and would reduce wildfire risk. Another power line would be utilized from the western boundary and would be an overhead line. The plan recommends locating utility lines underground, where practicable. (CMP p. 51) Please explain why this line is not also being buried. Due to regulations passed in October of last year, any above ground utility extensions will be required to have vegetation cleared within 10 feet of any new or existing power poles/towers.***

Response: The powerline to the top chairlift terminal was proposed as an above-ground powerline because it is proposed to be tapped into the existing, above-ground powerline that runs along the western perimeter of the Property. The Applicant proposed this because it matches the character and form of the existing structures. The Applicant is open to further discussing an underground powerline instead within the SDP if deemed necessary by County staff.

8. *Elk Creek Fire Protection District had many comments on how the site should be designed and constructed. While many of these would not be reviewed until the time of Site Development Plan, it is good to know what those requirements would be. Additionally, there are some items that should be considered at the time of Special Use.*

   8.a ***The Fire district talked about how an approved fire protection water supply capable of supplying the required fire flow for fire protection would be required. Would this***

require the installation of a cistern? If so, where would that be located and how would it impact the Special Use graphic?

Response: Refer to the Engineering Study for Water System Improvements included in this resubmittal package for an updated plan of a water supply system that meets this need.

8.b ***Does the fire flow report need to be submitted now or with the SDP?***

Response: The Applicant inquired about this question and confirmed with Elk Creek Fire Protection District in a meeting on August 25, 2023 that it will be submitted with the SDP.

VI. Design Guidelines

The Conifer/285 Corridor Area Plan contains many Design Guidelines on pages 33-48. Applicable policies are noted below.

Vistas, View Corridors & Scenic Areas

1. *Preserve view corridors for existing or future adjacent development.*

- ***We would like to see an updated visual analysis that has more vantage points and views of the lodge without a tree directly in front of it.***

Response: Please refer to the updated Visual Analysis included with this resubmittal package.

2. *In transition areas between lower and higher density uses, ensure that more intense uses are not visually obtrusive to adjacent lower density uses.*

- ***Comments about setbacks noted above should be addressed.***

Response: Recommended increase in setbacks has been integrated into ODP Written Restrictions.

3. *Prevent silhouette of structures on ridgelines.*

- ***It appears from the visual analysis that the top of the lift will not be right at the top of the ridge. However, additional vantage points will help to determine its visual impact.***

Response: Please refer to the updated Visual Analysis included with this resubmittal package.

4. *Avoid outdoor lighting within view corridors or on prominent ridges.*

   - *Outdoor lighting in Use Area B will be turned off after 10 pm. See above for further restrictions on lighting recommended around the wetland area.*

   Response: Lighting recommendations have been integrated into ODP Written Restrictions.

Parking

5. *Screen or obscure views of parking lots from adjacent public areas or unrelated land uses and on-site users.*

   - *The County's landscaping standards will require a certain amount of landscaping around the parking lot areas and within the parking lot itself.* ***It appears that not all of the landscaping standards would be met in the conceptual site plan.***

   Response: Refer to the ODP Written Restrictions to review modifications to landscaping standards.

6. *Minimize parking areas (impervious surfaces) and their expansiveness.*

   - *Two different areas of parking have been created with a landscape separation in the conceptual site plan.* ***The landscaping standards in the zoning resolution will a certain amount of landscaping around the parking lot areas and within the parking lot itself to break up the expansiveness of the parking lot.***

   Response: Noted, please see response VI.5 above.

7. *Orient building to site amenities. Separate parking from these areas.*

   - *The building and site amenities are adjacent to each other with the parking being between the amenities and Shadow Mountain Drive.*

   Response: Comment noted.

Signs

8. *Minimize the size and number of signs to avoid visually confusing roadway entrances or streetscapes. It goes on to state minimums of one sign per project per major road frontage and one sign per building, which lists all tenants.*

    - *The standards for signs are not modified, so the Zoning Resolution sign standards for Agricultural Districts. Those standards would only allow one ground sign along the road, but would allow more wall signs, with a total of 200 square feet of sign area.* ***Signs should be limited to one sign per building.***

    Response: Please refer to the additional signage restrictions in the ODP Written Restrictions included in this resubmittal package.

9. *Integrate signs into overall landscape and building design, carrying out a consistent graphic theme.*

    - ***Something about this could be added to the special use document.***

    Response: Noted. Would the staff recommend implementing a consistent graphic theme? The Applicant is open to further discussing sign design standards with County staff.

10. *Minimize negative visual impact of signs on adjacent areas. This guidelines goes on to states that signs should be no closer than 50 feet from adjacent neighbors, to limit signs to one per building and to limit size of a project sign to 64 square feet.*

    - ***These items could be added to the special use document.***

    Response: Please refer to the ODP Written Restrictions included in this resubmittal package.

Fencing and Screening

11. ***There are several policies regarding fencing. It is unclear what fencing will be needed at this time to determine which policies apply. At a minimum fencing should be wildlife-friendly.***

    Response: Please refer to the ODP Written Restrictions included in this resubmittal package.

Entrances

12. *Limit the number of entrances to commercial developments.*

    - *It is our understanding that only one entrance is proposed.*

Response: This is correct.

Air, Odor, Light and Noise

13. *Integrate light design into overall project design and architecture.*

    - ***This is not addressed.***

    Response: Lighting restrictions have been incorporated into the ODP Written Restrictions included in this resubmittal package.

14. *Minimize visual intrusiveness of lighting.*

    - ***The special use document restricts exterior lighting in Use Area B after 10 pm. There were some additional suggestions above in the Community Resources section of this memo.***

    Response: Please refer to the ODP Written Restrictions included in this resubmittal package.

15. *Minimize light falling on areas not used for activity. Areas not in use or after hours should be lighted only for essential safety requirements.*

    - *See comment above.*

    Response: Please refer to the ODP Written Restrictions included in this resubmittal package.

16. *Minimize the impact of people-generated noise or more quiet residential and recreation areas to a level that does not exceed normal noise levels of those adjacent uses. It goes on to recommend a minimum distance of 100' between a project's active recreation areas and existing of-site residential structures*

    - ***Setbacks of the lift should be specified as well as trails and maintenance roads from the property lines.***

    Response: 50-foot setbacks have been integrated in the ODP Written Restrictions and as such would create a distance of at least 100' between proposed recreation areas and existing off-site residential structures.

17. *Protect or preserve areas valued for the absence of man-made noise.*

- ***See comments above.***

Response: Noted, see responses above related to noise standards..

Wildlife & Vegetation

18. *Landscape with indigenous species, where possible.*

Response: See response to comment VI.19 below.

19. *Landscape to mimic natural systems.*

- *If this special use is approved, these two guidelines would be evaluated at the time of Site Development Plan.*

Response: Comment noted.

20. *Thin forests to allow light and water, etc. to filter downward to increase forest vigor and restore under story vegetation (ground cover) which increase visual and environmental quality (erosion and sediment, runoff, growth, etc.).*

- *A Wildfire Risk Assessment was created for this project. Additional suggestions based on this report were noted above under the Physical Constraints section of this memo. If the special use is approved, any work would be required prior to construction on the site.*

Response: Noted, see responses to Physical Constraints section of this memo above.

21. *Prevent habitat deterioration where critical wildlife areas exist. Enhance available habitat.*

Response: Noted. Please refer to First Referral Response – CPW – SMBP included with this resubmittal package for wildlife impacts and mitigation measures.

22. *Maintain the natural wildlife "carrying capacity" of sites that have moderate or high wildlife significance. Improve the carrying capacity of some sites to offset the loss of habitat in developed areas.*

- *Wildlife habitat is a concern with this proposal. See comments above under the Physical Constraints section of this memo.*

Response: Noted, see responses to Physical Constraints section of this memo above.

23. *Maintain natural vegetation ecosystems adjacent to and within bodies of water, streams, other watercourses, and within associated wetlands.*

    - *Protection of wetlands is a concern with this proposal. See comments above under the Physical Constraints section of this memo*

    Response: Noted, see responses to Physical Constraints section of this memo above.

24. *Maintain wildlife movement corridors of a size and character that ensure their continued use.*

    - *Wildlife habitat is a concern with this proposal. See comments above under the Physical Constraints section of this memo.*

    Response: Noted, see responses to Physical Constraints section of this memo above.

Open Space and Recreation

25. *Create attractive planting areas at building-land interface.*

    - *If this special use is approved, this guideline would be evaluated at the time of Site Development Plan.*

    Response: Comment noted.

26. *Prevent damage to vegetation along major roadways.*

    - ***Staff is recommending additional protection of the wetlands and stream corridor along Shadow Mountain Drive.***

    Response: Noted. Refer to the ODP Written Restrictions included in this resubmittal package.

27. *Avoid using exotic plant species unless: They blend with the intended character of the overall design; no native species can be used as a substitute; they are for special effect or focus.*

    Response: Comment noted.

28. *Create visual diversity and interest through selection of plant materials. Plant materials should achieve a visual and aesthetic balance between newly planted and existing vegetation as to character, form, size, and color.*

Response: Comment noted.

29. *Design public areas to be safe and secure.*

- *If this special use is approved, the design of the buildings and site would be evaluated at the time of Site Development Plan.*

Response: Comment noted.

Circulation

30. *Minimize visual scarring of road cuts, or disruption of scenic areas (e.g., meadows).*

- ***The visual analysis should adequately capture the impacts of the trails and maintenance road.***

Response: The updated Visual Analysis included with this resubmittal package includes further explanation of these impacts and better incorporates their potential visibility from all viewpoints.

31. *Preserve or create a rural image, even in more intensely developed areas*

Response: Noted. Please refer to the Narrative included with the initial application submittal for a discussion of the project's compatibility with the character of the surrounding areas.

32. *Access from parking lot to buildings, etc., should be convenient and safe.*

Response: Comment noted.

33. *Concentrate pedestrian circulation around site amenities.*

Response: Comment noted.

34. *Minimize the distance pedestrians must walk between buildings or activity.*

- *If this special use is approved, the design of the buildings and site would be evaluated at the time of Site Development Plan.*

Response: Comment noted.

35. *Design pedestrian/bikeways and roadways that create attractive, pleasant and safe features for users of the facilities and residents of adjacent property.*

- *This facility would create an off-road facility for bicyclists.*

Response: As described in the Application Narrative, the Project would provide a superior riding experience for interested community members, facilitate rider development for those who are new to the sport, and support the local economy in the Conifer area.

Energy

36. *Minimize negative visual impact of propane tanks.*

- *If this special use is approved, any mechanical equipment would be required to be screened.*

Response: Comment noted.

Privacy

37. *Maximize privacy, including visual and auditory, between new developments and existing residential areas.*

Response: Noted. Please refer to the Sensory Impact Assessment and the Visual Analysis for a summary of anticipated visual and auditory impacts of the Project.

38. *Maintain and enhance property values.*

- *See comments throughout this memo regarding increased setbacks.*

Response: Please refer to the Written Restrictions included in this resubmittal package.

Architectural Design Guidelines

39. *Orient, design, and construct structures that are people oriented and facilitate interaction.*

Response: Noted. The project includes structures such as a chairlift and a day lodge that will provide opportunities for recreation, education, and events, which will support and facilitate interactions among guests at SMBP, employees at SMBP, and other community members.

40. *Buildings should be small and clustered, scaled to respect topography, views and vegetation*

Response: Noted. The development proposes two buildings on the Property and their placement considered topography, views, and vegetation. Specifically, the Maintenance Building would be primarily shielded by vegetation from Shadow Mountain Drive, and both buildings are located in areas that have naturally flatter topography than elsewhere within the Property.

41. *Balance the proportional relationship of the form of building to size of the lot/parcel.*

Response: Noted. The Property is recommended for Residential use, which would accommodate up to 25 homes on the 306-acre parcel. In comparison, this Project proposes two buildings. The proportion of building square-footage to size of the lot/parcel would be less than one percent.

42. *Structures should avoid overpowering the site and be sensitive to the natural landscape's variety and diversity.*

Response: Noted. Please refer to the Visual Analysis for a description of the visual impacts of proposed structures and ODP Written Restrictions regarding maximum building square footage.

43. *Use the massive elements of the building to express depth, substance, and strength, rather than only surface veneer, i.e., exposed timber, structural beams, solid rock, walls, etc.*

Response: Noted. This design consideration has already been considered and will be incorporated in the SDP and final design process.

44. *Create interesting, diverse, stimulating streets and walls that create varied experiences for people and respond to the landscape in an informal and organic way*

Response: Noted. This design consideration has already been considered and will be incorporated in the SDP and final design process.

45. *Use sculptures, fountains/water features, wood carvings, awnings and canopies, balconies, patios and terraces, flags and banners, umbrellas, the annual colors of flowers and trees (i.e., Aspen), accent lighting, painted wall graphics, etc., in detailing projects.*

Response: Noted. This design consideration will be incorporated in the SDP and final design process.

46. *Create pedestrian amenities that complement surrounding site conditions.*

Response: Noted. This design consideration will be incorporated in the SDP and final design process.

47. *Minimize negative visual impact of exposed foundations.*

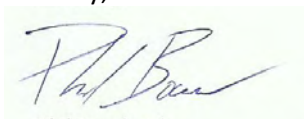
47.a *Several of these items could be added into the special use document, others will be addressed by existing regulations if this special use is approved and the project moves forward to the Site Development Plan process.*

Response: Noted. Please see ODP Written Restrictions included in this resubmittal package.

47.b ***A Class III recreation facility does not have a size limit. A maximum size should be added to the special use document.***

Response: Noted. Please see ODP Written Restrictions included in this resubmittal package regarding maximum building square footage and areas with development restrictions.

Sincerely,



Phil Bouchard

Shadow Mountain Bike Park

Jason Evans

Shadow Mountain Bike Park