

Public Comment

[REDACTED]

From: [REDACTED]
Sent: Monday, December 2, 2024 12:16 PM
To: [REDACTED]
Subject: Re: Hello Neighbors!

Thanks for spearheading this!

Although I am unable to attend the meeting, I kindly ask that someone bring up this concern on my behalf to ensure it is entered into the record regarding the proposed development.

My primary concern involves the "thoroughfare" leading to our side of Castlewood Ranch. Based on the current plans, the temporary portion of Mitchell Street is set to be removed and relocated further north. While this adjustment might seem minor, it raises a significant issue: despite the availability of Mitchell Street just a few hundred yards north, many drivers may opt to use the newly proposed southernmost surface street to access our portion of the neighborhood.

This change is likely to result in unnecessary traffic and additional safety risks for the approximately 70 houses indicated in that area on the plans. Additionally, the increased distance caused by the new road alignment would make reaching our part of the neighborhood even more inconvenient than it already is.

I appreciate your attention to this matter and hope it will be considered as part of the overall evaluation of the development's impact.

Sincerely,

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



[REDACTED] Mon, Dec 2, 2024 at 10:51 AM [REDACTED]@g [REDACTED]

[REDACTED]

BrieAnna Simon

From: [REDACTED]
Sent: Wednesday, November 27, 2024 1:01 PM
To: BrieAnna Simon
Subject: Bella Mesa North

After a quick look at the included site drawings, It looks to me like there is only one way in and one way out of the development. If that is the case and with over 500 homes, I would think that would mean over 1000 vehicles. They would be driving past the middle school as their only way to town. That sounds like a lot of traffic past the middle school daily. I look to observe the meeting online and would like to hear the logic involved.

Thank you.

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[REDACTED]
[REDACTED]

BrieAnna Simon

From: [REDACTED]

Sent: Tuesday, January 7, 2025 12:26 PM

To: Jacob Vargish <JVargish@crgov.com>; Tara Vargish <TVargish@crgov.com>; Kevin Wrede <KWrede@crgov.com>; Sandy Vossler <SVossler@crgov.com>; Brad Boland <BBoland@crgov.com>; TJ Kucewesky <TKucewesky@crgov.com>

Subject: Concerning the development of Bella Mesa North

To the planning team for the development of Castle Rock,

I am writing to you to discuss the development of Bella Mesa North. This is a space that is currently being slated for development of some 500 new homes. This space is an important one and I have compiled important information regarding its value and ecological importance. I have also begun a petition that has already accrued 150 signatures in a week. I believe that it is important to bring this to your attention to see the value of this space and the need for its preservation. I hope that you can help support the initiative to preserve this space that is a valued heritage for the unique beauty of Colorado.

[REDACTED]

From: [REDACTED]
Sent: Tuesday, December 31, 2024 12:12 PM
To: TownCouncil Mailbox
Cc: BrieAnna Simon
Subject: Bella Mesa North Development
Attachments: 20241210_163657.jpg

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Council Members,

I want to take a moment of your time to express my concerns regarding the development application for the Bella Mesa North community. It is a pitiful shame that this beautiful remnant of open space has been zoned for residential development at all, but the application for a massive 525 homes on this secluded section of land is irresponsible at best. There will be one primary road expected to handle the thousand + vehicle trips per day. This road will also be the single route for all traffic to and from the Mesa Middle School. Currently it is difficult to exit our community of Bella Mesa at school time and this will become unmanageable.

The developer is basing the density of homes on acreage which is unusable, down into the canyon. They have planned on placing homes a mere 60 feet away from homes which have had unlimited empty space next to them for the life of their homes. I would encourage you to force the developer to adjust the home density based on actual usable acreage and eliminate their encroachment upon existing homes to, at a minimum, match the existing density of the adjacent community.

This development benefits no one other than the developer, and the past approvals should be overturned and a logical review and approval of a smaller , more rural development applied to this parcel.

Thank you for your time.

[REDACTED]

[REDACTED]



From: [Tara Vargish](#)
To: [REDACTED]
Cc: [BrieAnna Simon](#)
Subject: RE: Speak with you regarding Bella Mesa North
Date: Monday, March 3, 2025 4:17:14 PM

Ms. [REDACTED]

Thank you for reaching out and for your interest in connecting with Councilmember Brooks and other councilmembers regarding Bella Mesa North Site Development Plan. We understand and appreciate your desire to share your thoughts on this matter.

Because this application is considered a *quasi-judicial* land use matter, the law requires that all communications and information presented to the Council be part of the official public record. As a result, councilmembers cannot engage in ex-parte communications—meaning they are not allowed to discuss the issue outside of the formal public hearing process. This ensures fairness, transparency, and that all parties have an equal opportunity to present information and be heard.

If you would like to share your views, we encourage you to do so through the official channels:

1. **Submit Written Comments:** You may submit written comments to be included in the public record. These comments will be shared with all councilmembers and considered as part of the decision-making process. Your email from Feb 17th to Town Council, BrieAnna's response to that, and the email you sent below to Councilmember Brooks are already a part of that record. If you have additional items you'd like to add, please feel free to email those to myself and BrieAnna Simon at bsimon@crgov.com.
2. **Participate in the Public Hearing:** You are also welcome to speak during the two public hearings for this item. They have not been scheduled yet, however there will be a Planning Commission hearing to make a recommendation, and then a Town Council hearing for the decision. This is an opportunity for you to share your perspective directly with the Council in a formal setting.

When those formal public hearings are scheduled, notice will be mailed to property owners within 500 feet of the property and signs placed on the property, just as the informal neighborhood meetings have been noticed. You can also view public notices at www.CRGov.com/Notices, which shows all upcoming public hearings and neighborhood meetings 15 days ahead of each meeting. Additionally, BrieAnna and myself are happy to meet with you to help explain the zoning and land use entitlements that are currently on the property and how the Town conducts reviews with each department on these types of land use projects. If you would like to meet, let me know and I can get back to you with our availability.

We appreciate your interest in the Bella Mesa North site development plan and look forward to ensuring your voice is heard through the appropriate processes.

Thank you,

Tara Vargish, PE, Director Development Services
Town of Castle Rock, Town Hall, 100 N. Wilcox St, Castle Rock, CO 80104
direct 720.733.3582 mobile 720-473-2473 tvargish@CRgov.com

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Your feedback is important to us, please let us know how we are doing by taking our Customer Service survey:
<https://www.surveymonkey.com/r/LR35C27>

From: Max Brooks <MBrooks@crgov.com>
Sent: Sunday, March 2, 2025 9:39 PM
To: [REDACTED]
Cc: Tara Vargish <TVargish@crgov.com>
Subject: Re: Speak with you regarding Bella Mesa North

Ms. [REDACTED],

Good evening.

You are correct - the neighborhood meetings are mandatory (three of them) and should give residents an opportunity to express concerns or raise questions. The staff there to take notes will bring that information back to the Development Services team for review and ongoing discussions with the developer.

Following the final neighborhood meeting a date will be set for the development project to be heard in a public meeting and quasi judicial setting in front of the Town's Planning Commission. The Planning Commissioners vote on a recommended action to Town Council, and then Council will hear the same presentations and consider the application.

I am going to CC the Director of Development Services so she may properly route your questions and concerns. I think it would be beneficial for some fact checking of some areas of concern you have, just to ensure we're on the same page.

As a resident in the area, I've certainly fielded some concerns about the development and understand the questions that are being raised.

I'd absolutely encourage you to gather concerned neighbors and be sure to attend the Planning Commission meeting for this item (not yet scheduled). You'll have an opportunity to present testimony during that hearing, and having your voices heard is an important part of the process.

Tara should be able to get us started in the correct direction.

Thank you for reaching out!

Very best,

Max Brooks

Councilmember - District 5

Castlewood Ranch, Founders Village, Glovers/Baldwin Park

o: 303.663.4403

c: 720.910.4002

On Feb 27, 2025, at 1:34 PM, [REDACTED] wrote:

Hello Mr. Brooks,

I left a message at your office yesterday and so far, have not heard back from anyone.

Many of the homeowners in Castlewood Ranch are very concerned about the 'proposed'

development of Bella Mesa North. We would like the opportunity to meet with you to voice those concerns since the meetings with Redland and Cardel homes have been quite dissatisfactory.

With no one from the city present (with the exception of Brianna to take notes), the builder & developer reps merely state what they plan to do and then listen (to say they did so) to our concerns. Seems they are required to have these 'informative ' public gatherings but what is the point, if nothing much is changed? The City Council is the last stop and we just hate to see this plan get passed by all of you without serious changes. It's far too dense - too many homes for this 'land locked' area. It's extremely dangerous in an emergency. When is too much traffic declared a problem? 5000 more trips on Mitchell per day?? How many more homes can the fire department cover? How about 5.3mil more gallons of water consumed in a month? A new road must required, built to the northwest out of that land to connect with Hwy 86. We cannot expect 1000 additional vehicles and 1400+ people to be able to get in and out of that area only to the south on Mitchell, past all the other hundreds of existing homes to reach either Enderud or Ridge. It seems recent disastrous fires (the Marshall fire and those in LA) might get someone's attention. The area may have been rezoned in 2015 but that's 10 years ago and must be revisited.

Can you spare time to meet with some of us? We are planning to get many signatures of neighbors here who agree that this plan is very dangerous to all the surrounding communities! Can you and the Council knock some sense into whomever at the City thinks only about how to increase tax revenues? Or do we just give up?

Thank you and we hope we can meet with you.

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[REDACTED]
[REDACTED]
[REDACTED]

From: [REDACTED]
To: [BrieAnna Simon](#)
Subject: RE: Bella Mesa North
Date: Tuesday, February 18, 2025 4:11:37 PM
Attachments: [image001.png](#)

Thank you for your response BrieAnna, and thank you for your work with the City. I won't be able to be there in person (had cataract surgeries last week) but I plan to be online. Thanks for passing my concerns along, though I'm not sure I have much faith that this will be stopped. My biggest concern is the traffic that will be created and that the only exits from the development are to the south, past hundreds of homes on single lane, winding streets. Oh – you already know my complaints!! Take care.
Regards, [REDACTED]

From: BrieAnna Simon <BSimon@crgov.com>
Sent: Tuesday, February 18, 2025 11:14 AM
To: [REDACTED]
Cc: Tara Vargish <TVargish@crgov.com>; TownCouncil Mailbox <towncouncil@crgov.com>
Subject: RE: Bella Mesa North

Good morning [REDACTED],

Thank you for providing your feedback and comments related to the quasi-judicial Bella Mesa North Site Development Plan. Your information has been compiled and will be provided in the public hearing packets to both the Planning Commission and Town Council, who makes the final decision on this application.

The Bella Mesa North project area was zoned in 2014 to allow for a maximum on 525 units. The Bella Mesa North Site Development Plan (SDP) has completed its first review with the Town. This SDP is the next step that shows how the 525 homes and road network will be laid out. This is an active land use application and going through the staff review process at this time. Town professionals are reviewing the plans to ensure all Town criteria is met. I have forwarded your concerns to the appropriate departments. Staff will take these concerns into consideration as we review the provided plans.

The Town of Castle Rock Fire Department reviews the submitted plans for compliance with the Town's fire codes and wildfire mitigation plans. The Town of Castle Rock Public Works Department reviews the submitted plans and Traffic Impact Study for compliance with the Town's traffic regulations. Additionally, Castle Rock Water Department reviews the plans provided for compliance with the Town's current Coloradoscape landscaping and irrigation manuals. Please note, the review and acceptance of a final and acceptable plan has not occurred at this time and most likely more draft versions will be seen. Staff will continue to work with the developer through the review process on this project, to ensure they meet Town requirements.

As part of the Town's review process, we work closely with Colorado Parks and Wildlife (CPW). The Town does not have any regulations specificity related to deer, coyotes, wolves, turkeys & birds, and therefore relies on the wildlife professionals at CPW for recommendations. CPW has reviewed the first submittal of the Site Development Plan. As part of that zoning review, the Town worked with the developer to ensure a minimum of 95.9 acres of open space dedication be provided. The developer is currently proposing 174 acres or 59 percent of the property be open space. Homes in the planning areas are

clustered in order to provide for the large open space dedication area. This meets the recommendations provided by CPW.

We appreciate your comments and concerns on this development. This Site Development Plan will have future Neighborhood Meetings and Public Hearings before the Planning Commission and Town Council as it advances through the process. Please feel free to send me any additional questions or concerns.

Thank you.



BrieAnna Simon

Development Services | Senior Planner
Town Hall, 100 N. Wilcox St, Castle Rock, CO 80104
Direct 720.733.3566 | bsimon@crgov.com

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From: [REDACTED]
Date: February 17, 2025 at 2:23:06 PM MST
To: TownCouncil Mailbox <towncouncil@crgov.com>
Subject: Bella Mesa North

Dear Council Members,

Thank you for the work you do for our city.

Regarding the proposed development of Bella Mesa North: as residents on Sheldon Ave we strongly object to the addition of 525 homes in that area.

I am re-stating below our objections (ours and those of the other attendees of the last meeting on December 2nd, 2024). From my letter:

“Per the US Census Bureau (2018-2022) 2.83 people live in a ‘household’ in Castle Rock. That equates to a future 1485 people living in this development and an estimated 1000+ vehicles. The biggest problem with this idea is that there will be no exits from the development to the north, east or west due to the terrain there. In the event of a wild fire, not only will all those 1400+ people and their vehicles attempt to exit the area, but the Mesa Middle School would also need to be evacuated (if this occurred on a weekday) - all exiting to the south on both Mitchell streets, past the school and past the Castlewood Ranch streets and Flagstone Elementary.

Attendees at the meeting asked about the additional normal traffic this development would create. Cardel said they had a traffic study done. Someone after the meeting said they had seen this study and it showed that approximately an additional 5200+ trips/day would be created on those two streets – and that’s with NO emergencies. Cardel said ‘the traffic circle at Mitchell and Mikelson’ was the solution to this issue. With no new homes, the construction of that traffic circle created tremendous traffic at school drop off and pick up times on the eastern section of Mitchell. We live on Sheldon Ave and at those times, *even before that construction*, it is very difficult to get past the middle school.

Cardel's site plan includes removing the east/west section, of Mitchell, that residents living in this northern section of existing Bella Mesa and Castlewood Ranch (Sheldon Ave & Fallon Circle) use daily. That street is part of the Bella Mesa North property, not owned by the city. They plan to build one of the densest sections of homes right back up against the current homes on Ardmore. Those residents are upset. Not only will their mountain views be gone, replaced with the backs of 20 houses, but they worry about drainage into their properties and possible damage to their homes from the blasting that will be required to build in that rocky terrain – Cardel's civil engineer in attendance said 'blasting' would be done.

With all the concerns in this drought, about water shortages and our increasing traffic issues in CR, – what is the rationalization of continuing to build, build, build? Zoning created in the 80s really needs to be re-visited. Increasing revenues continually for the city IS NOT a rational for irresponsible decisions. It will definitely lead to people leaving the area instead.

Other concerns were raised about pushing our wildlife population out of the mesa. Cardel said they did a study and didn't see any 'nesting' that would be disturbed. Really? – adding 500+ houses, streets, concrete, 1400+ people and their 1000 cars won't disturb the deer, coyotes, wolves, turkeys & birds etc that live here?

That property should be only allowed to be developed into a greatly reduced number of homes, perhaps on acre lots, far from the edges of the property so they or their lights are not seen from below – just as the lots on the canyon rim (east edge) were required to be single stories on large lots as on Sheldon, where we live.

Interestingly, in the three times I've heard discussions of this development, the builder first stated they expected the prices of these homes to be "in seven figures". The next number on the zoom call I was on, was \$900k. Then, last Monday night, it was \$800k. I'm retired from real estate now but I'm not sure someone would want to pay even \$800k for any sized house on a 5500-6600sf lot (another figure quoted by Cardel on the zoom call). The real estate market has cooled so hopefully these people are losing interest in this project as their profit margin continues to erode. And hopefully you guys put some serious restrictions on what can be built in that area! Thank you for your attention to this matter. "

Please pass these comments around and *please, please* consider restricting the developer/builder to a far less dense housing project! Change the zoning to something reasonable and responsible. Everything cannot always be about the money!

Regards,

[REDACTED]

BrieAnna Simon

From: [REDACTED]
Sent: Monday, December 9, 2024 2:18 PM
To: BrieAnna Simon
Subject: Summary Notes from Bella Mesa North Meeting 12_2_24
Attachments: Bella Mesa North Meeting Summary to BrieAnna from 12_02_24 .docx

Follow Up Flag: Follow up
Flag Status: Flagged

Hi BrieAnna,

Good afternoon. Thanks again for listening and taking notes during the above meeting last week. As you heard, there are many important concerns about the current proposal for Bella Mesa North.

[REDACTED] told me that she had talked with you, sent to you her summary, and that you would appreciate receiving my summary. Thank you, I'm glad to send it to you (attached).

The proposed houses in Bella Mesa North are far too close to Castlewood Ranch adjoining land owners. As currently proposed, the new two-story row homes, just North of Ardmore St, on the tiny lots, are a proposed 54' feet from our property lines. These propose with only 15' backyards.

The proposed houses would tower over our backyards and home. This would grievously affect our quality of lifestyle and potentially our home values.

Also, as I noted in the meeting there is a also a major drainage concern that would need to be corrected if the proposed buildings were allowed.

The beauty of Castle Rock's landscape is rapidly vanishing. This is happening on our current leaders' watch. The density and zoning of the proposed development was approved before the explosive building that is becoming visible in Castle Rock. What can be done to better protect existing property owners?

If Bella Mesa North were allowed to continue as proposed, the developers would reap their revenue and move on to their next project. The City would have increased the tax base. However, the natural beauty or our area would have been stripped. Would progress be primarily defined by money — rather than long term benefits from quality of lifestyle?

I proposed in the meeting that the developer remove all of the homes South of the planned center street that goes through Bella Mesa North. Make this area an open space. This would include the removal of the straight portion of Mitchell street, as currently proposed. The developer could reallocate their planned investment dollars to another subdivision.

However, with further consideration: I recommend that the City buy the approximately 300 acres where Bella Mesa North is proposed and make it a natural open space. This would provide a bookend to the new South open space.

We need more open spaces to offset the density of explosive developments. I ask the City leaders to be champions — women and men who will fight and protect Castle Rock's natural beauty and quality of lifestyle.

Would the City please help the Castlewood Ranch current homeowners and protect our quality of lifestyle and the natural beauty of this area?

Thanks so much,

[REDACTED]

[REDACTED]

From:

To:

Subject:

Date:

Bella Mesa project

Wednesday, February 26, 2025 10:02:40 AM

Dear Mr. Conway, Ms. Hepfer, and Ms. Simon,

My name is [REDACTED]

[REDACTED] I recently returned from out of town, and when collecting my mail found a letter from you informing me and my husband of a "neighborhood meeting" taking place on the day before we picked up our mail. In reading the contents of the letter, I also found that there had been a previous meeting in November regarding your project, as well, a notice not received by us. I contacted my neighbor for information he might have gleaned from either of these meetings, and he confirmed that he had not received the original notice either.

It would appear that these notices have not reached the people involved on Castlewood Place in such time that attendance at your meetings was possible. IF there was a recording of either or both, please allow a copy or podcast to the above email address.

These are some of the concerns I have regarding this project. The map included with your latest notice is grossly misaligned with property lines, especially as regards your stated "setbacks". Any kind of trail along the rock face without protection at the rim will subject our properties to rockfall, water issues, and property and privacy invasion. The necessity of drilling and blasting will subject our properties to noise, rockfall, air pollution and further encroachment to wildlife corridors, already compromised. We have experienced all of these things with the previous development, which was further from us than the one you propose.

Please respond with suggestions as to how we may discuss these issues further.

Sincerely,

[REDACTED]

From: [REDACTED]
To: [BrieAnna Simon](#)
Subject: Bella Mesa North development
Date: Thursday, May 15, 2025 9:41:49 AM

Hello BrieAnna!

My name is [REDACTED] I met you briefly at the last public meeting regarding the Bella Mesa North proposed development. I wanted to reach out as you mentioned that you are the contact for the city regarding concerns that the community is requesting to be addressed. I have completed a document that lays out these concerns, and I wanted to submit it to you for consideration. Please let me know if you have any questions or concerns that I could address regarding this work.

Thank you for your time and attention.

[REDACTED]

[REDACTED]

Bella Mesa North

Friends of the Glade Proposal
April 22, 2025

Who We Are

Friends of the Glade is a grassroots community organization dedicated to preserving the natural beauty and ecological integrity of Bella Mesa North in Castle Rock. We are local residents, outdoor enthusiasts, environmental advocates, and concerned citizens who have witnessed firsthand the remarkable biodiversity and unique geological features that make this area an irreplaceable community asset.

United by our commitment to responsible land stewardship, we believe that some spaces deserve protection rather than development. Our coalition formed in response to the proposed construction of 525 homes on this ecologically rich land. Through community outreach, ecological documentation, and collaborative advocacy, we've gathered over 600 supporters who share our vision of preserving this natural space for current and future generations.

We seek to work constructively with the Town Council, conservation organizations, and all stakeholders to find sustainable solutions that balance community growth with environmental preservation and minimize impacts to existing community infrastructure due to proposed additional construction. Friends of the Glade represents the voice of Castle Rock residents who value our natural heritage and recognize that Bella Mesa North offers greater long-term value to our community as protected open space than as housing development.

Executive Summary:

The Friends of the Glade seek Town Council intervention to preserve the 291-acre Bella Mesa North property as protected public open space rather than allowing development of 525 homes. This ecologically significant area adjacent to Mitchell Creek Canyon contains rare geological formations, documented wildlife habitat including threatened species, and established recreational trails already in use by the community.

Our petition, supported by 647 residents, demonstrates strong community opposition to development that would irreversibly damage this unique ecosystem. The proposed housing density creates dangerous wildland-urban interface conditions with inadequate emergency egress, while construction would require extensive bedrock blasting near unstable cliff formations.

Preserving this land would extend existing protected areas, maintain critical wildlife corridors, protect watershed quality, preserve potential archaeological resources, and provide lasting recreational and ecological value for Castle Rock residents. We request the Council deny the current development proposal and initiate steps to acquire this property for permanent conservation as public open space.

Our Concerns

Ecological Impact: Development would destroy critical habitat for diverse wildlife including bobcats, raptors, and the federally threatened Preble's Meadow Jumping mouse.

Fire Safety Risk: The proposed density (4.2 homes per acre) creates a dangerous high-density Wildland-Urban Interface with limited evacuation routes.

Geological Uniqueness: Rare formations including hoodoos and fossil sites would be damaged by construction and increased human activity.

Watershed Concerns: Residential chemicals and runoff would contaminate Mitchell Creek and damage downstream ecosystems.

Cultural Resources: Archaeological artifacts including arrowheads and hand axes indicate historical significance requiring protection.

Community Opposition: 647 verified petition signatures demonstrate strong local support for preservation over development.

Recreational Value: The land already contains established trails connecting to Mitchell Creek trail system with minimal improvement needed.

Biodiversity Loss: Development would eliminate grasslands that provide essential food sources for canyon wildlife populations.

Public Land Opportunity: The space would be more valuable as an extension of adjacent Gateway Mesa Open Space than as private housing.

Construction Risks: Dense bedrock requires extensive blasting that could destabilize cliff edges and existing fault lines.

Our Request

We urge the Town of Castle Rock to:

1. **Deny the current development proposal for 525 homes on Bella Mesa North.**
2. **Designate the 291-acre Bella Mesa North property as protected open space.**
3. **Pursue acquisition of the land for public conservation purposes through appropriate funding mechanisms.**
4. **Incorporate this land into the existing Gateway Mesa Open Space and Mitchell Creek trail system.**

5. **Implement minimal trail improvements to connect with existing recreation areas while prioritizing ecological preservation.**

Friends of the Glade Proposal

Proposal:

Establish the Bella Mesa North land as an open space to protect the unique ecosystem, unique beauty, and recreational activities.

Contributing Factors

- The location is already adjacent to an open space—Gateway Mesa and Mitchell Creek Open space on the northside of Mitchell Creek canyon. This would protect the entire canyon and allow for some open space surrounding the ecosystem.
- Mitchell Creek trail has a connection that would allow hikers to connect to the loop trail if developed further
- The trail loop is already an established trail.
- Mountain bikers already are using the trail
- The land is close to Castlewood Canyon which is a protected State park

Summary Arguments for preservation

This space is uniquely beautiful. It is such a remarkable space that it should be considered an asset in its undeveloped state. This land is so remarkably beautiful that it is not only an asset to the city and county but to the whole state. It has unique geological formations such as hoodoos, large amounts of high-quality petrified wood, some large portions of which are still embedded in the rock, and evidence of fossils. There is also evidence of cultural value in hand axes and arrowheads found in the area. The ecosystem is very unique. The mesa is part of a raised elevation in the area where high plains meet a Montaigne forest with large cliff sides. There are very few ecosystems like this. The space contains vultures, hawks, eagles, falcons, flickers, woodpeckers, owls, ravens, crows, deer, bull snakes, rattlesnakes, lizards, as well as some evidence of mountain lions and bears. The proposed development would destroy a large amount of habitable space as well as the major food source for life in the canyon. The wildlife would suffer incredibly as their food source is removed and they are constrained to the limited food supply of the canyon. The current population of raptors and predators would not likely be able to find sufficient food after development. The space is also in a migratory space where a variety of birds travel through. This can include sandhill cranes, falcons, etc.

Perhaps the greatest relevant concern has to do with the Wildland-Urban Interface. With 525 homes slated to be built on ~123 acres, the average acre would have 4.2 homes. A high density WUI is considered to be three and up. This heavily increases the fire risk where it is being built abutting up

to the edge of an old growth forest in the canyon. We believe the developers have mischaracterized the Wildland-Urban interface by calculating the size of the entire space and arriving at the number of 1.78 density without subtracting the open space.

Overdevelopment and overpopulation would put these homes and this land at risk for devastating loss especially as we see more climate change effects that are creating disasters such as in the recent fires in L.A. Not only is this is risk for housing loss, but with limited egress, a fast moving fire would be potentially catastrophic.

Ecological Value

The mesa is part of a raised elevation where high plains meet Montaigne forest with large cliff sides within it. There are very few ecosystems like this. The space contains bobcats, coyotes, skunks, vultures, owls, hawks, eagles, falcons, flickers, woodpeckers, owls, ravens, crows, deer, bull snakes, rattlesnakes, lizards, the federally threatened Preble's Meadow Jumping mouse, pronghorn as well as evidence of mountain lions and bears. The proposed development would destroy a large amount of habitable space as well as the major food source for life in the canyon. The wildlife would suffer incredibly as their food source is removed and they are constrained to the limited food supply of the canyon. The current population of raptors and predators would likely not be able to find sufficient food after development. The space is in a migratory space where a variety of birds travel through. This can include sandhill cranes, falcons, Harrier hawks, etc.

Biodiversity

In December of 2024, a trail cam was set up near the canyon edge to track what kind of wildlife are in the area and get a better idea of the impact that development would bring. In less than a month, the trail-cam caught rabbit, squirrel, deer, raccoon, skunk, coyote and bobcat.

This rich biodiversity can not be sustained if 500 homes are pressing up against this limited canyon space. This space needs to be given space around it to maintain the biodiversity. The grasslands surrounding the canyon are a critical source of food for this ecosystem. Even without building in the canyon, 500 homes will bring an influx of pollutants including herbicides, insecticides, automotive pollution and other toxins that would leach into the canyon and destroy even more of the insect and plant life that support this ecosystem. Development will destroy the diversity of life in a fragile ecosystem.

The Federally threatened Preble's Meadow Jumping mouse has also been observed in the space and this added limitation to the biome would further the loss of this species.



-5°C/24°F 01/04/2025 04:24:02



-2°C/29°F 12/24/2024 03:42:43





-1°C/31°F 12/20/2024 01:06:36



5°C/41°F 12/19/2024 00:30:55

Cultural value

Several artifacts have been found in this location indicating use by First Nation populations. Flint knapping chips, arrowheads, and hand axes have been found. Near the west edge, there are locations with knapped rock chips.



Ecological impact

The ecological impact of creating a high-density housing development will be very great and very detrimental. The developer is proposing 525 houses. With each household having a minimum of 2 people per house and perhaps as many as 5 people per house being more likely, the population of this 160 acres will be somewhere between 1500 to 3000 people. There would be at least a thousand more cars on the land. The homeowners would add pollutants of herbicide, insecticide, fertilizer, and other chemicals to the environment. This might be mostly contained in the sewer system, yet, we have to expect a fair amount of this running into Mitchell Creek.

The development of this community would mean that there will be more than 2000 people in the area. The trail system would also attract visitors into the area to explore the unique features of the land. There is no parking lot for visitors meaning that this space will be used nearly exclusively by the development community. The space would not be able to accommodate any number of visitors to enjoy what is left of the unique landscape.

Bedrock concerns

The mesa is composed of dense bedrock. To build on this space will require significant amounts of blasting. There are numerous fault lines running north and south along the mesa where large sections of rock have already shifted. There are also many rock formations that are precipitous and may be loosened prematurely near the cliff edge. It is reasonable to assume that this blasting could affect the more precarious edges of the cliff as the shock waves move through the rock and fault lines.

Biodiversity

A trail cam was set up in Mid-December to get a brief survey of the biodiversity that lives around the canyon. In less than a month, a stag deer, a bobcat, several rabbits, a skunk and a coyote were recorded. This biodiversity would be severely impacted. Adding 2000 people onto 190 acres pressing up to the edge of the canyon and making the remaining space into a personal park would push this wildlife further and remove a large food source that supports the canyon wildlife. The biodiversity that is currently there would be heavily decreased and the ecological system would rapidly disintegrate.

Deer have been struck by vehicles on Enderud blvd. Their habitat has been steadily diminished so they have little choice but to wander into the neighborhoods to search for food where they are likely to be struck by vehicles especially in the winter. Constraining this space would further the damage done to the deer population as well as other large mammals that live in the area.

Migration Space

This space is important for migrating birds. The area has had hummingbirds, Harriers, Sandhill cranes, Eagles, hawks, vultures, corvids, falcons, kites and other birds that travel through on their migration paths.

Safety concerns

This amount of people would be contained in a space where there is one primary way in and out of the community. Though there is a route on the east side, it is more roundabout to exit the community. So, the main point of direct egress is going to be Mitchell st. This location could be at risk for wildfires that are increasing as we face climate change. This space is itself a fire threat and would be at great risk if a fire ever moved through the area. Fire risk for the canyon increases as well, as people are more likely to venture into the old growth forests in the Mitchell creek canyon.

Colorado's Wildland-Urban Interface

"Uncontrolled wildland fire is particularly hazardous in the wildland-urban interface (WUI), areas where human development is close to, or within, natural terrain and flammable vegetation.

The wildland-urban interface, or WUI, is the area where structures and other human developments meet or intermingle with wildland vegetation. Wildfires in Colorado are a natural part of our ecosystems and help restore and maintain healthy forests.

During the past few decades, population in the interface has increased. Homes, businesses and subdivisions are being built on forested lands that have historically seen regular fires, and even need them to remain healthy. In order to preserve human life and property, firefighters have worked hard to suppress and control fires; this has had a negative effect on functioning ecosystems.

To help return forests to a more "natural" state, it is important that land managers and property owners work together. Buildings and the surrounding property should be adapted so that, when fires burn, firefighters can do their job safely to protect man-made structures while allowing fire to take its natural course in the ecosystem. Allowing natural fires to occur will help create a healthier forest and ultimately reduce the risks associated with large and unmanageable fires."

- From the Colorado State Fire service.

The total space of the land is 293.2 acres. The open space acreage is 165. And there are 4.5 acres allotted for park space. This means that the working space for housing is 123.8 acres. With 525 homes slated to be built on ~123 acres, the average acre would have 4.2 homes. This heavily increases the fire risk where it is being built abutting up to the edge of an old growth forest in the canyon. We believe the developers have mischaracterized the Wildland-Urban interface by calculating the size of the entire space and arriving at the number of 1.78 density without subtracting the open space.

Overdevelopment and overpopulation would put these homes and this land at risk for devastating loss especially as we see more climate change effects that are creating disasters such as in the recent fires in L.A. Not only is this is risk for housing loss, but with limited egress, a fast moving fire would be potentially catastrophic.



LEGEND

- [A] Park**
- [B] Playground**
- [C] Enhanced Open Space**
- [D] Pedestrian Node**
- [E] Pond**
- [F] Outdoor Classroom**
- [G] Parking**
- [H] Lift Station**

SITE DATA:

TOTAL ACREAGE: 293.2 Acres

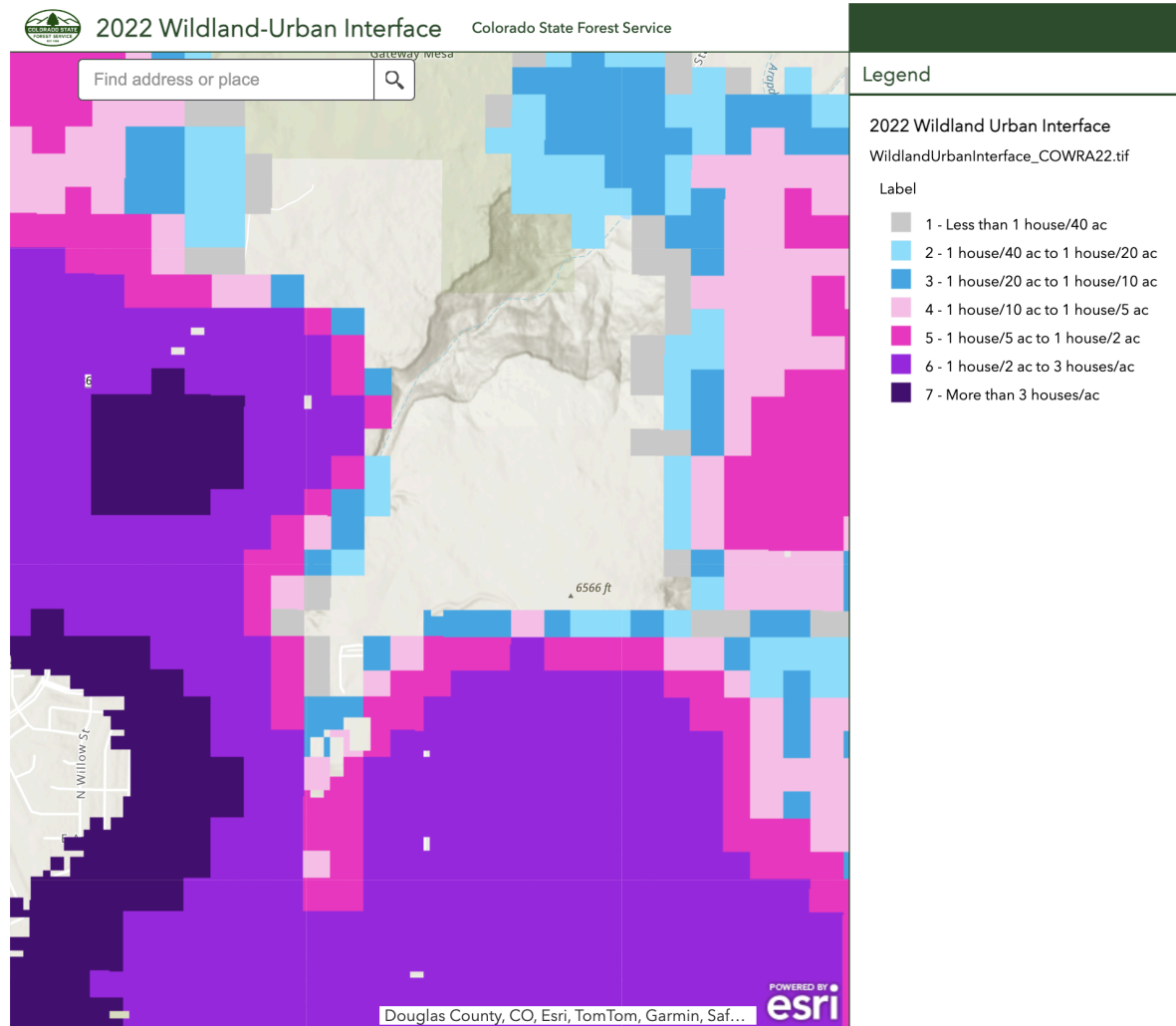
OPEN SPACE ACREAGE: +/- 165 Acres

PARK ACREAGE: 4.5 Acres

NUMBER OF LOTS AND TYPE: 525 Single Family Detached Lots

OVERALL (GROSS) DENSITY: 1.78 DU/AC

structures while allowing fire to take its natural course in the ecosystem. Allowing natural fires to occur will help create forest and ultimately reduce the risks associated with large and unmanageable fires.

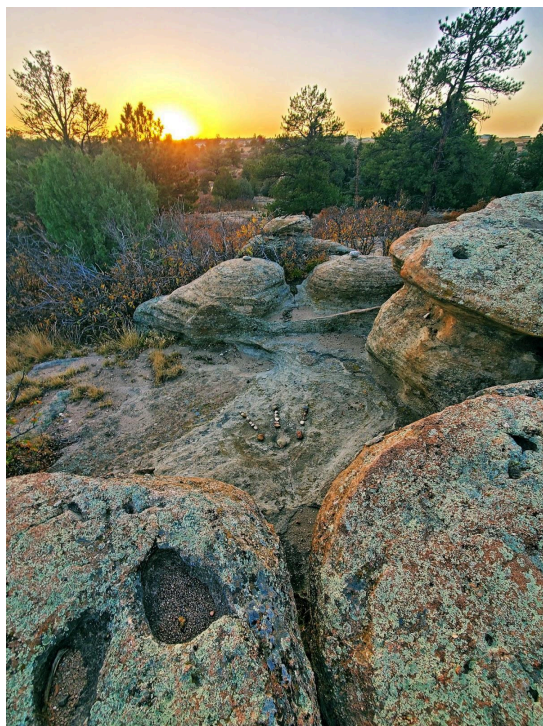
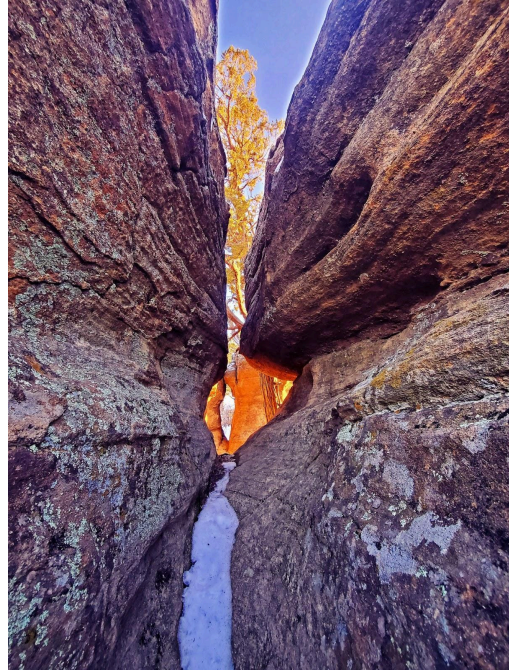


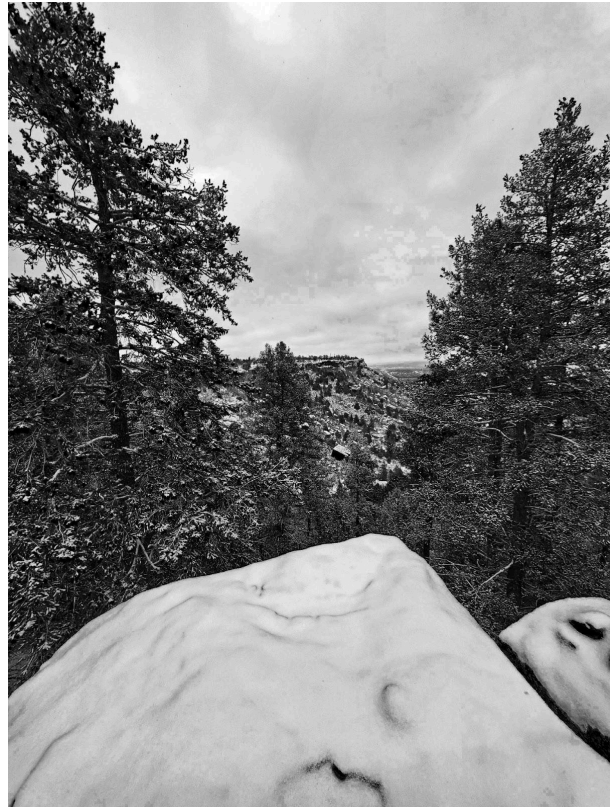
Neighborhood demand

A petition has been created to show the local interest in keeping this space preserved. There is a wide recognition that this unique space is an asset to the city, county and state and that it is more important to preserve its uniqueness than to develop houses on it.

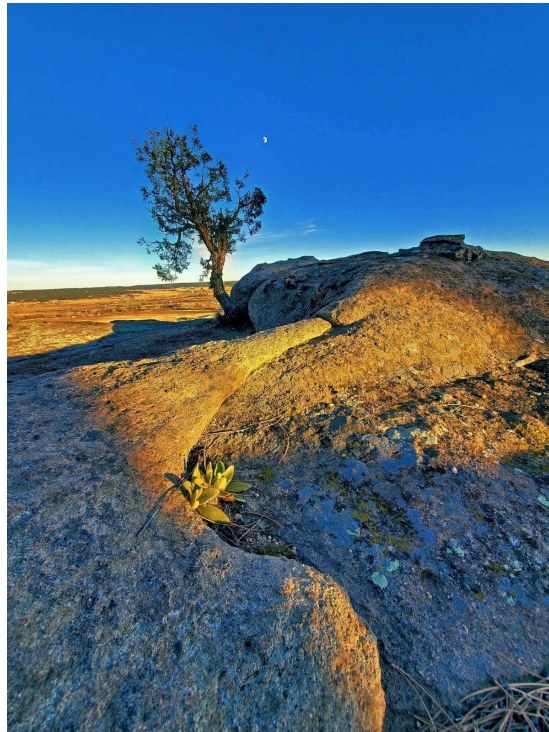
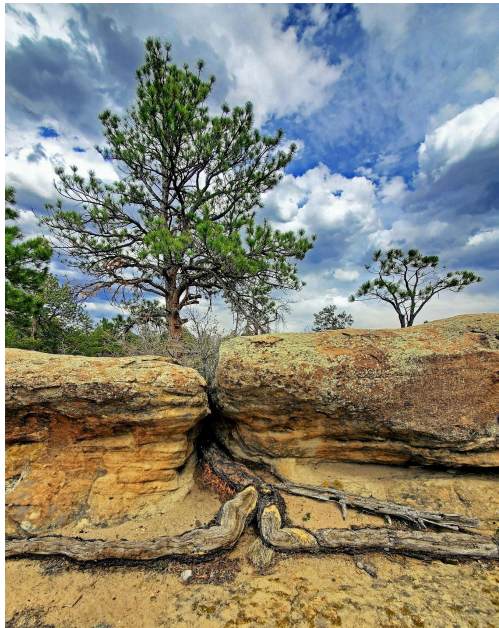
<https://www.change.org/savebellamesa>

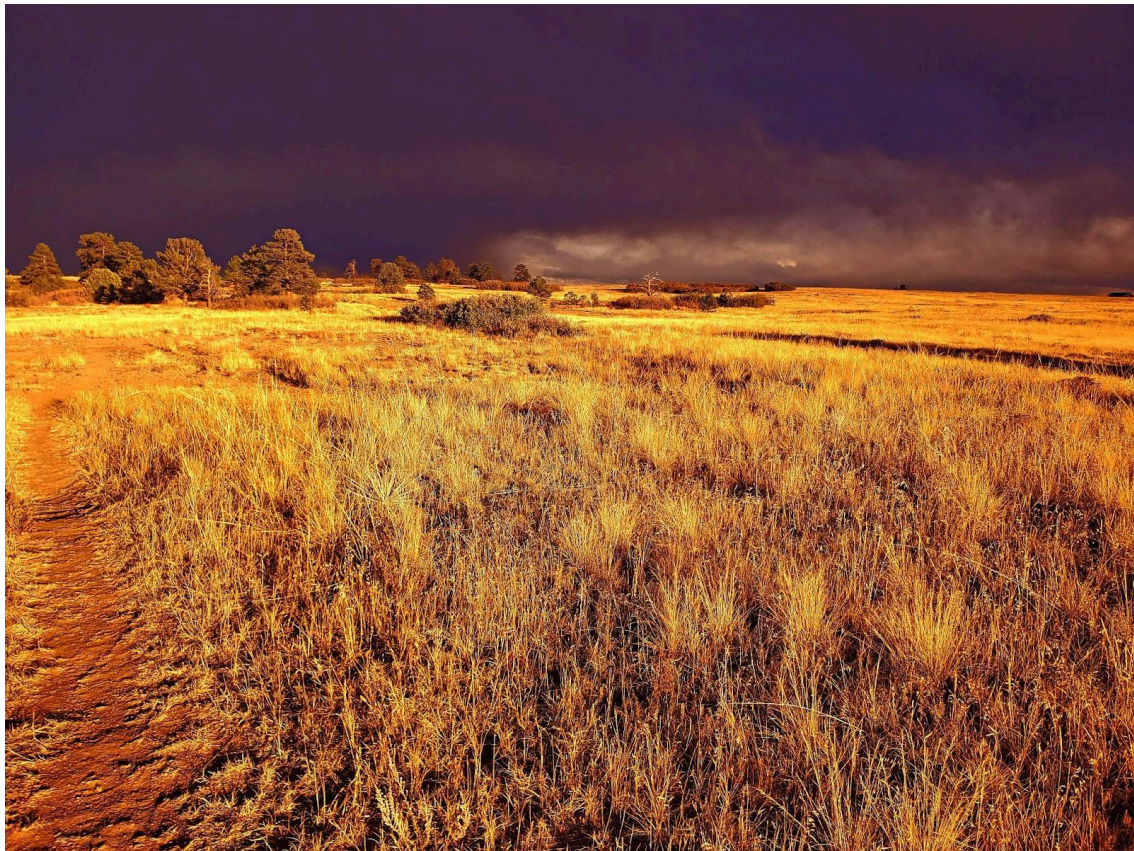
Unique Beauty

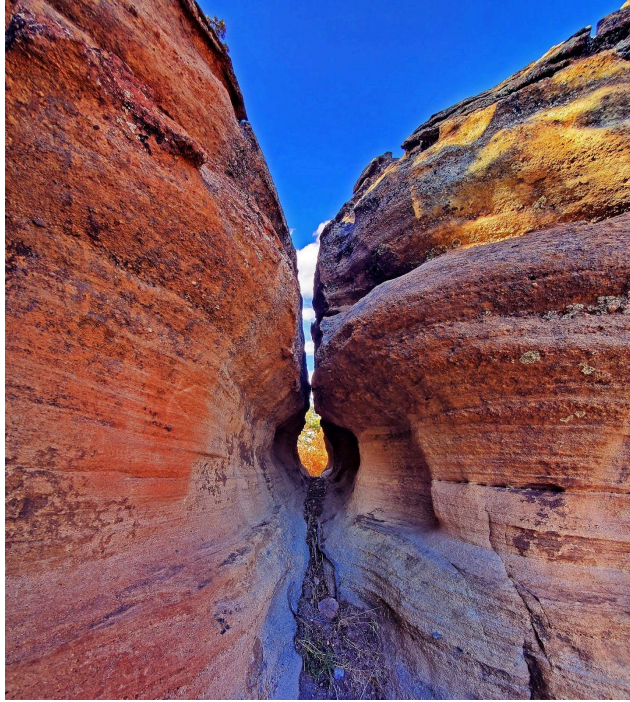










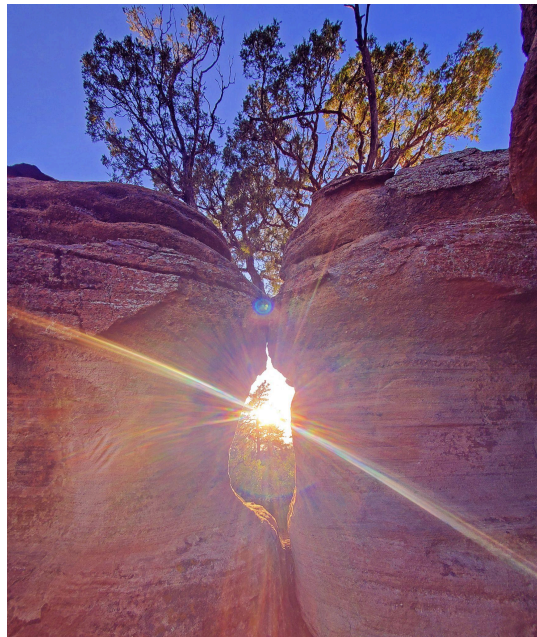
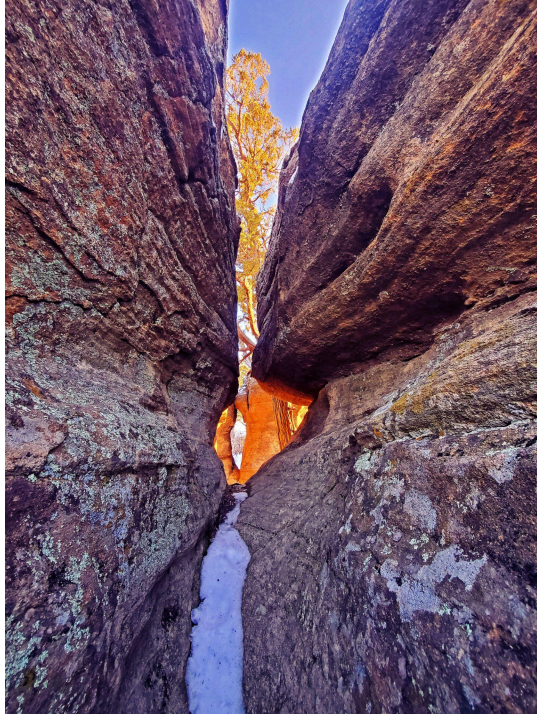


With the unique beauty that this land presents, development would drastically impoverish the space. Houses are planned on being up to 300 feet from the edge of the canyon. Trails would be limited to around the canyon and the views from the top of the mesa as well as from the valley would be severely damaged. Many of the unique formations would lose much of their value as they would be built right up to them. The open space is not only valuable for the views but also for the ecology of the space. The density of the new population would add further pressures on the ecosystem and the beauty of the space.

The Mushroom Rock formation

There is a formation near the Northeast that the development company is calling Five-rock formation. This is a geological formation known as a Hoodoo (A hoodoo-also called a tent rock, fairy chimney, or earth pyramid) is a tall, thin spire of rock formed by erosion. Hoodoos typically consist of relatively soft rock topped by harder, less easily eroded stone that protects each column from the elements. They generally form within sedimentary rock and volcanic rock formations.) This feature has a large juniper tree growing in the center. It is a very unique formation that is quasi-sculptural in its effect. It has the monumental quality of a Richerd Serra sculpture and the graceful lines of a Constantin Brancussi. This formation is composed of soft sandstone and it has already been graffitied permanently from carving in two places as well as on the tree. Creating an open classroom nearby as well as having a highly used trail puts this formation at high risk of defacement and rapid erosion. It would invite this feature to be climbed and marked which would rapidly damage the natural beauty.



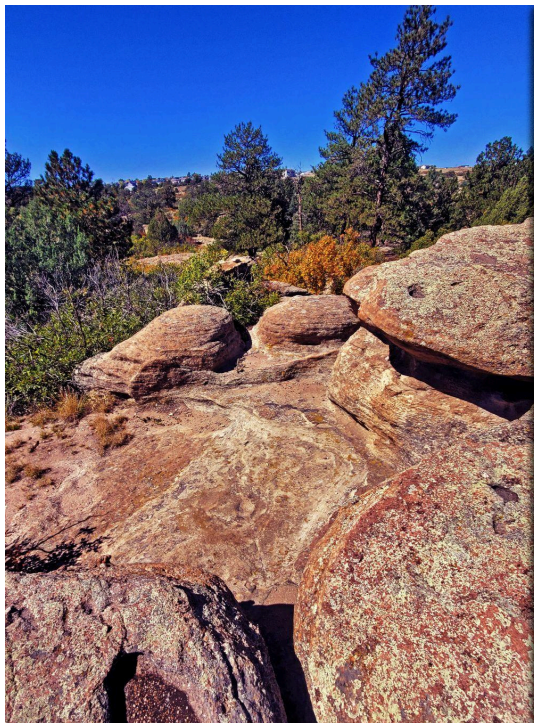




Other Formations

Further to the north central portion of the cliffs is a formation I have come to call the goddess formation. It is also a unique features that would invite defacement and rapid erosion if it is not protected. The entire space contains these unique formations that become high-risk of defacement and erosion if this space becomes the backyard park for 2000 residents. This space is geologically unique and should be protected.

Evidence of Fossils of large vertebrates have been found that need to be researched and protected at this location.



Recreational Value

This space has an established trail. There would be no need to build any additional trail. The trail is also connected to the Mitchell Creek trail to the west. This could be improved with a bridge and stairs for safety and erosion control. This would connect an already established open space with little work or expense.



Appendix 1: Basic Information regarding the land

The Space

The space, known as Bella Mesa North lies to the south side adjacent to Mitchell Creek Canyon, Gateway Mesa Open space and the Mitchell creek trail. It consists of 5 land parcels. These plots have been numbered in order to track them easier.

This space has moved forward in development plans to build more than 500 houses. Our proposal is that this land should be considered as more valuable as an open space or state park to be preserved.

Parcel 1

Number: 2507-081-00-026
Acres: 49.028
Actual Value: \$13,575
Assessed Value: \$3,580

Parcel 2

Number: 2507-043-00-002
Acres: 110
Actual Value: \$30,457
Assessed Value: \$8,040

Parcel 3

Number: 2507-054-00-011
Acres: 2.05
Actual Value: \$568
Assessed Value: \$150

Parcel 4

Number: 2507-043-00-001
Acres: 50
Actual Value: \$13,844
Assessed Value: \$3,650

Parcel 5

Number: 2507-043-00-001
Acres: 80
Actual Value: \$22,150
Assessed Value: \$5,850

Total space

Acres: 291.078
Actual Value: \$80,594

Assessed Value: \$21,270
Last sale 2014: \$12,500,000

2019 Property Value Change

In 2019, the valuation of the land was changed. The assessment went from vacant land to agricultural land. This reduced the value significantly and was likely to ease the tax burden.

Plot	2019 Vacant land	2019 Agricultural land	2024 Actual	2024 Assessed
1	\$588,336	\$13,280	\$13,575	\$3,580
2	\$1,320,000	\$29,796	\$30,457	\$8,040
3	\$24,600	\$555	\$568	\$150
4	\$600,000	\$13,544	\$13,844	\$3,650
5	\$960,000	\$21,670	\$22,150	\$5,850
Total	\$3,492,936	\$78,845	\$80,594	\$21,270

BrieAnna Grandy

From: [REDACTED]
Sent: Monday, September 22, 2025 4:34 PM
To: Ray Gardner
Cc: BrieAnna Grandy; [REDACTED]
Subject: Re: Bella Mesa North - Proposed Site Development Plan

Mr. Gardner,

Thank you for your thoughtful and complete message.

The development company Cardel and the planning and engineering firm Redlands have been working on this for the better part of two years, so many of your points have been taken into account. For example, there was a very complete wildlife inventory made last year and the development concepts and planning take the findings into account. The research was done by the environmental firm Birch Ecology, which worked closely with Redland and Cardel in developing the final master plan.

Since back in 2006, the Town of Castle Rock community development department has been closely monitoring and regulating the design of the plan you now see, including substantial setback around the perimeter and most specifically along the eastern boundary. Nevertheless, during the construction phases, the development team will indeed be mindful of your concerns, which are important to all of the parties. All want to avoid the potential consequences of a rockfall anywhere, but particularly onto improved and occupied property like yours.

While my own role is somewhat passive as this transition's to Cardel & Redland, I can assure you that we will be in the background, looking after all that you addressed. Please do come on Wednesday. When you meet and hear these professionals speaking to your and others' issues, I believe you will gain the confidence that the property will be carefully and mindfully developed.

Thanks again for your interest.

Best regards,
John
[REDACTED]

[REDACTED]

BrieAnna Grandy

From: Ray Gardner [REDACTED]
Sent: Monday, September 22, 2025 3:01 PM
To: BrieAnna Grandy; Sara Dieringer; John Hill; [REDACTED]
Subject: Bella Mesa North - Proposed Site Development Plan

Follow Up Flag: Follow up
Flag Status: Flagged

Hi,
My name is Ray Gardner. I am the resident and home owner at [REDACTED] I am planning to be in attendance for the neighborhood meeting on Wednesday evening but wanted to submit a few questions in advance.

First, does the applicant have a rockfall study and associated rockfall mitigation plan for this development? As a resident immediately below the construction area, this is of particular concern. Prior construction projects near cliff faces in the Town of Castle Rock have required a study and plan. For example, during the expansion of the St Francis of Assisi Church, both the Colorado Geological Survey and Douglas County expressed significant concern that the proposed expansion would impose construction-related disturbances and vibration that could increase the rockfall hazard. In prior meetings I have not heard of any such study being completed. If such a study has been completed and/or a plan exists I would ask that these are shared with neighboring residents such as myself. The rock formation under the church is the same rock formation found at Bella Mesa and the cliff face at Bella Mesa does have a history of rockfall. As a result I would expect that the mitigation measures implemented for the expansion of the church (which did not include basements) would be an absolute minimum standard that the county should expect to be implemented.

Next, has the applicant completed a wildlife study? Specifically, what are the construction practices planned to minimize impact to nesting eagles? We do see a large number of large raptors and specifically eagles in this area.

As it relates to the trail on East side of the development, several of the adjoining neighbors have expressed concern with the proximity of the trail to the cliff edge. Unfortunately our comments do not appear to have been considered in the layout of the development and trail system. The location of the trail presents a hazard to not only the people that utilize it but to the individuals living below. For comparison purposes, the trail system in neighboring Castlewood Canyon State park runs near but not along the edge of the canyon. Doing so helps reduce the hazard of increased rockfall and helps prevent people from throwing items off the cliff impacting anyone who happens to be below the cliff face. In the case of Bella Mesa having a trail along the cliff edge increases the risk of rockfall, causes significant noise pollution to those of us living at the base of the cliff, and contributes to rocks, trash and other items being thrown off the cliff.

Finally, I think it is important for the Town to consider how the Bella Mesa fits with the Douglas County Master Plan. In this case, I don't believe high density tract housing bordering 10 acre lots and located in view of Hwy 83 aligns with the plan. Utilizing a transition area of larger lots (2-5 acres) would provide a transition area as well as protect the view from Hwy 83 in alignment with the Douglas County Master Plan.

Thank you in advance for considering and answering my questions. Although I recognize that development of this area is likely and expected I think it is important that it is done in a responsible way. I am unfortunately unable to attend the Planning Commission Public Hearing on Thursday, September 25th but plan to attend the Neighborhood meeting on Wednesday, September 24th and look forward to your responses to my questions.

Thanks,

Ray Gardner

[REDACTED]
[REDACTED]

Sent from my iPad

BrieAnna Grandy

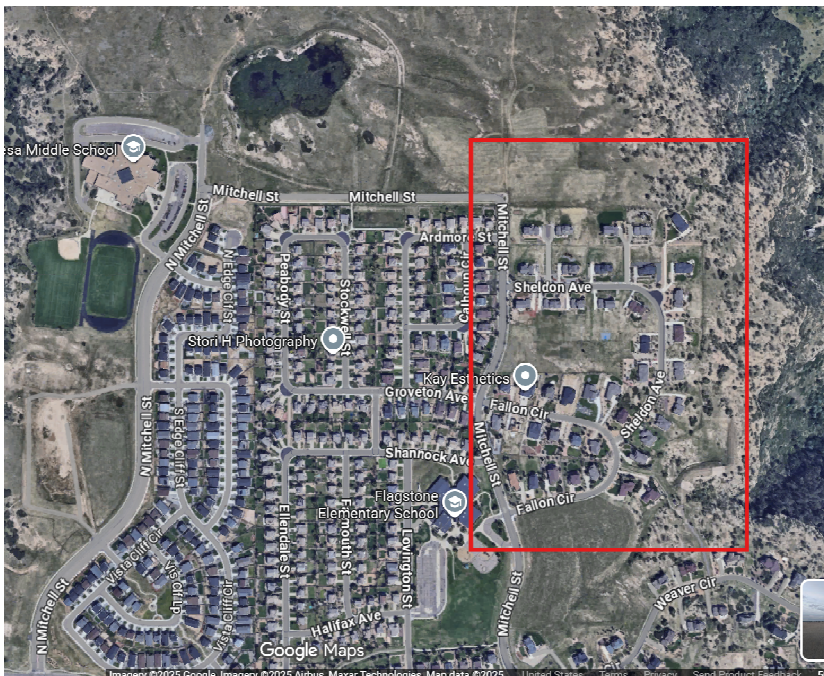
From: Collin Lutz [REDACTED]
Sent: Thursday, September 25, 2025 6:13 AM
To: BrieAnna Grandy; TownCouncil Mailbox
Cc: Jessica Lutz; Ray Gardner; [REDACTED]
Subject: Bella Mesa North Proposed Development Plan

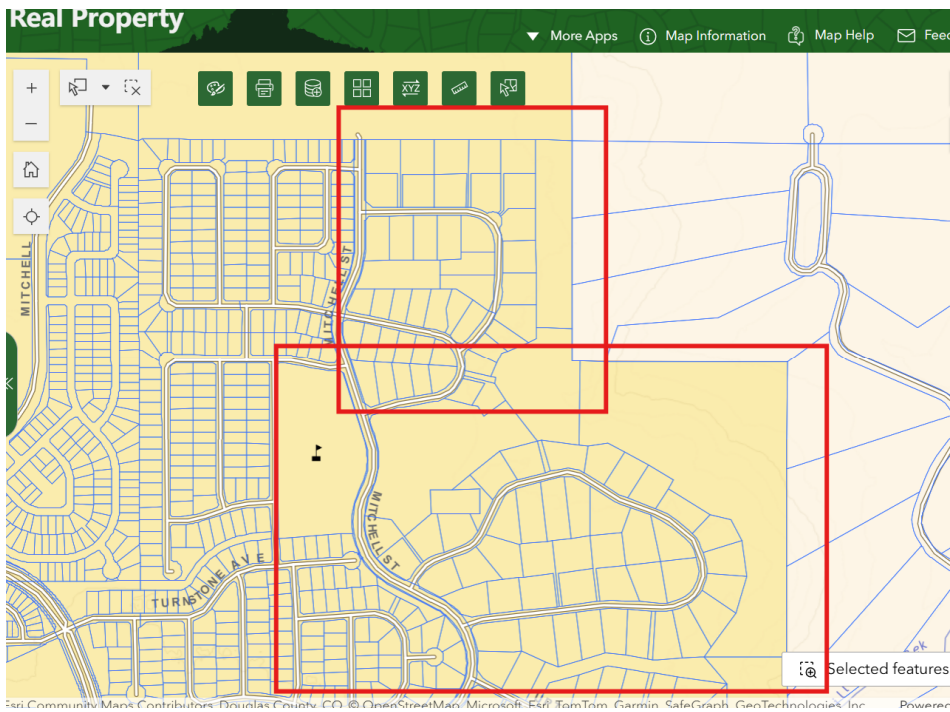
Follow Up Flag: Follow up
Flag Status: Flagged

Hello,

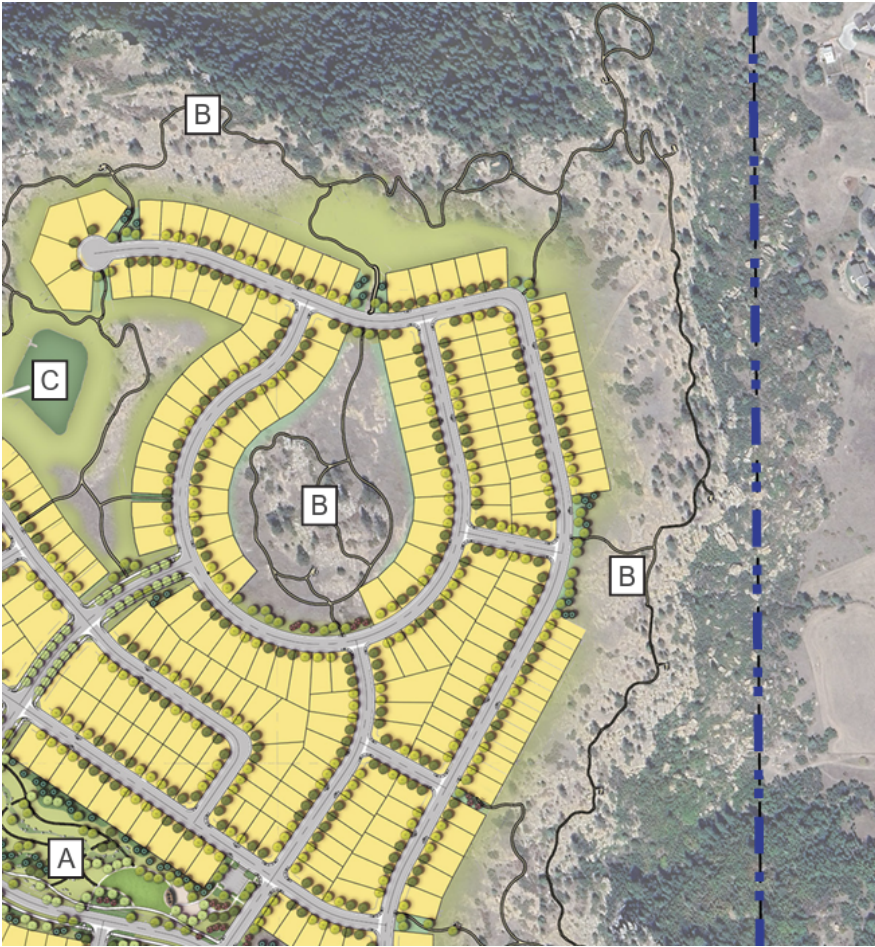
I am writing in regards to the Bella Mesa North Proposed Site Development Plan and associated Planning Commission meeting this evening. I am traveling for work and unable to attend the meeting tonight, but I wanted to express my displeasure with how this project has been handled and the developer's disregard for feedback gathered during numerous neighborhood meetings that I have attended in person. In those meetings, I have expressed the following concerns with the proposed development, but the concerns seem to be falling on deaf ears. I am concerned that the development will economically damage property owners in Franktown to the east of the ridgeline by putting high-density housing with significant foot traffic near a rural community with large acre (10-15 ac) lots. Our property values and our privacy will be impacted.

1) New developments should blend to match existing, adjoining communities. In this case, the proposed site development plan is placing high-density, tract housing next to a large-acreage, rural community in Franktown, east of the ridgeline. As I have highlighted in the image below, Castlewood Ranch to the south, in contrast, was developed to transition to larger lot sizes near the ridge to blend to the existing rural community below.





2) Impact to privacy and view (important factors in value of existing property owners in Franktown): When Bella Mesa North was annexed by the Town of Castle Rock, setbacks to the ridgeline were defined to avoid destroying the view and value of properties to the east in rural Franktown. These visual setbacks were put in place to ensure that the views of the property owners below would not be impacted. However, these setbacks are violated by proposed trail systems that follow the ridgeline. A constant stream of people along the ridgeline violating our privacy and our views is just as economically damaging as a new structure/home impeding our views in Franktown to the east of the proposed development. I am strongly opposed to a trail system along the ridgeline that will destroy our privacy, view, and property values in Franktown to the east and below the mesa.



3) Blasting of basements: The ridgeline is a very fragile rockfall area with very large boulders precariously held in place today where they have fallen. If dynamite is used to blast basements in Bella Mesa North, property owners below the ridgeline are at risk, both in terms of rockfall, but also fault-line vibrations carried through capstone in the area.

4) Impact to wildlife: The area is home to nesting birds of prey, including bald eagles, golden eagles, and peregrine falcons in addition to mountain lions, bears, bobcats, and more. A high density development will destroy valuable ecological habitat for these animals.

I have expressed these concerns at prior neighborhood meetings, but the developer seemingly does not care. I am imploring the Town of Castle Rock to do the right thing here to preserve the rural community in Franktown below the mesa, protect wildlife in the area, preserve our property values, and preserve our rural privacy. If this development damages property owners in rural Franktown to the east, you can be assured we will take action to recoup our losses.

Respectfully,
Collin Lutz

BrieAnna Grandy

From: Ray Gardner [REDACTED]
Sent: Thursday, September 25, 2025 12:11 PM
To: Planning Commission; TownCouncil Mailbox; BrieAnna Grandy
Subject: Bella Mesa North - Proposed Site Development Plan
Attachments: Bella_Mesa_Gardner(9-22-25).pdf; RockTalk_ Rockfall in Colorado.pdf

To Whom it May Concern:

I am writing in regards to the Bella Mesa North Proposed Site Development Plan and associated Planning Commission meeting this evening. I wanted to emphasize and expand on the concerns I previously raised below. I am unfortunately unable to attend the meeting in person but wanted to make sure my concerns were noted.

During the neighborhood meeting yesterday, September 24th, the applicant revealed that they have not completed a Rock Fall study, do not have a rock fall mitigation plan and intend to utilize blasting as an excavation methodology. As a resident living below this planned development this is extremely concerning. As I mention below, when the St Francis of Assisi Church in Castle Rock was doing an expansion, that did not include blasting or a basement, both Douglas County and the Colorado Geological Survey expressed significant concern that the construction activities would increase the rock fall hazard and required significant mitigations to be put in place. The rock formation under the church is the same rock formation found at Bella Mesa and I believe the proposed construction presents a similar if not substantially more significant hazard.

I have attached a presentation that addresses the rock fall hazard as well as an article from the Colorado Geological Survey highlighting the St Francis of Assisi Church project as a case study (page 16).

I would implore that Town of Castle Rock to not allow this development to proceed as currently proposed and specifically to not allow blasting as a construction methodology.

Respectfully,

[REDACTED]
[REDACTED]
[REDACTED]

Begin forwarded message:

>
> -----Original Message-----
> From: Ray Gardner [REDACTED]
> Sent: Monday, September 22, 2025 3:01 PM
> To: Bgrandy@CRgov.com; Sara Dieringer [REDACTED] John Hill [REDACTED]
[REDACTED]
> Cc: Collin Lutz [REDACTED]
> Subject: Bella Mesa North - Proposed Site Development Plan
>
> External Sender: This message came from outside of the Cardel Homes network, please be cautious when clicking on links or opening attachments
>
> Hi,
> My name is Ray Gardner. I am the resident and home owner at [REDACTED] I am planning to be in attendance for the neighborhood meeting on Wednesday evening but wanted to submit a few questions in advance.
>
> First, does the applicant have a rockfall study and associated rockfall mitigation plan for this development? As a resident immediately below the construction area, this is of particular concern. Prior construction projects near cliff faces in the Town of Castle Rock have required a study and plan. For example, during the expansion of the St Francis of Assisi Church, both the Colorado Geological Survey and Douglas County expressed significant concern that the proposed expansion would impose construction-related disturbances and vibration that could increase the rockfall hazard. In prior meetings I have not heard of

any such study being completed. If such a study has been completed and/or a plan exists I would ask that these are shared with neighboring residents such as myself. The rock formation under the church is the same rock formation found at Bella Mesa and the cliff face at Bella Mesa does have a history of rockfall. As a result I would expect that the mitigation measures implemented for the expansion of the church (which did not include basements) would be an absolute minimum standard that the county should expect to be implemented.

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>

> Finally, I think it is important for the Town to consider how the Bella Mesa fits with the Douglas County Master Plan. In this case, I don't believe high density tract housing bordering 10 acre lots and located in view of Hwy 83 aligns with the plan. Utilizing a transition area of larger lots (2-5 acres) would provide a transition area as well as protect the view from Hwy 83 in alignment with the Douglas County Master Plan.

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>

> Thanks,

> Ray Gardner

>

> [REDACTED]

> [REDACTED]

>

>

> Sent from my iPad

> IMPORTANT NOTICE: This message and any attached documents are only for the use of the intended recipient(s), are confidential and may contain privileged information. Any unauthorized review, use, retransmission, or other disclosure is strictly prohibited. If you have received this message in error, notify the sender immediately, and delete the original message.

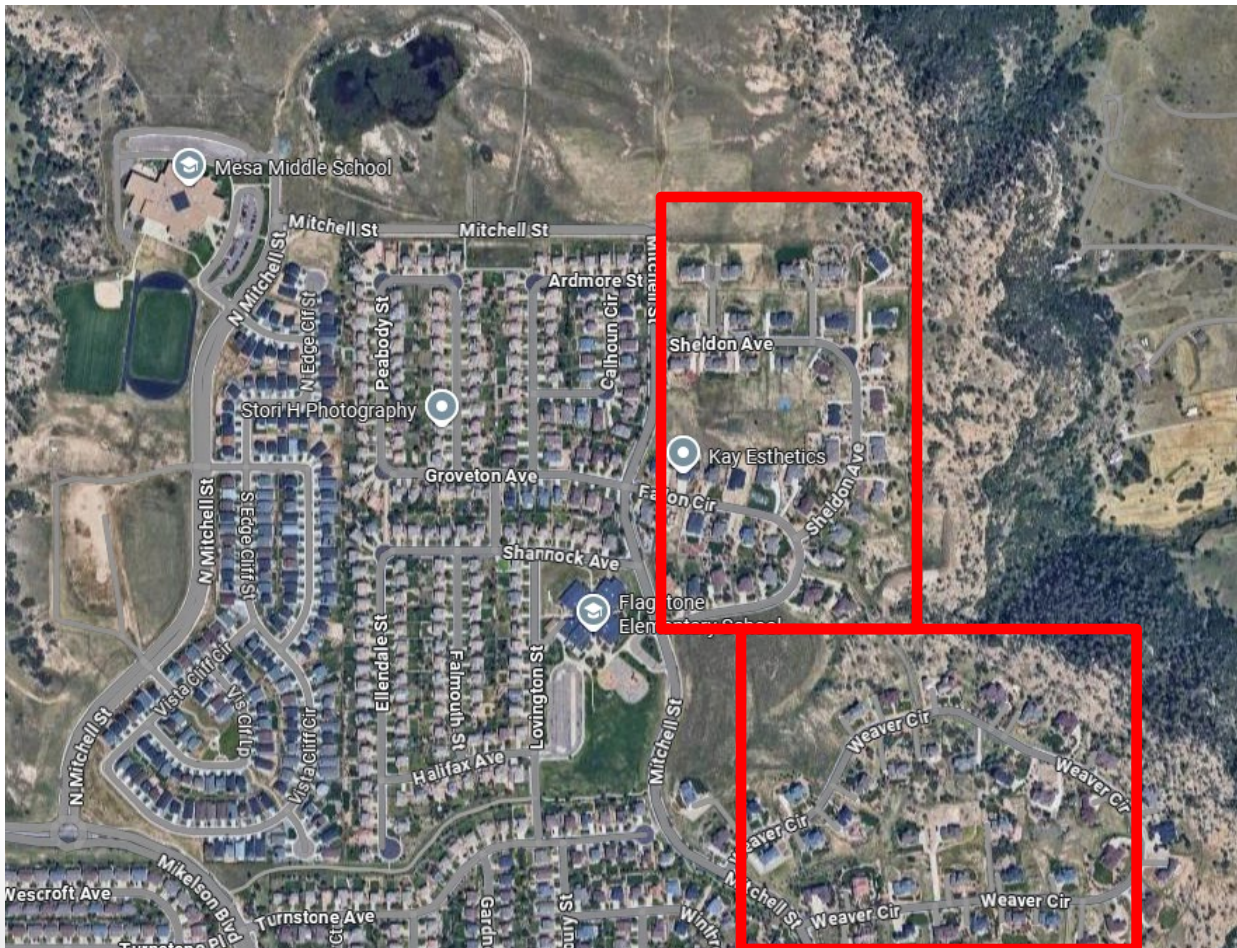
Bella Mesa North Proposed Site Development Plan

September 25, 2025

Presented by: Ray Gardner – Castlewood North Resident

Transition Zones

- Neighborhoods immediately to the South of Bella Mesa North include large lot transition zone between high density tract housing and bordering 10+ acre lots.
- Bella Mesa North Proposed Site Development Plan does not include this



What is a Rockfall?

- Rockfall is the fastest type of landslide and is common in mountainous areas near cliffs of broken, faulted, or jointed bedrock, on steep slopes of rocky soils, or where cliffy bedrock ledges are undercut by erosion or human activity.



Past Rockfall



Occurred in the early 2000's

Case Study in Castle Rock – St Francis of Assisi Church - 2008



Colorado Geological Survey, Rock Talk Volume 11, Number 2 Winter 2008

Case Study in Castle Rock – St Francis of Assisi Church - 2008

- Church sits atop a bluff of blocky Castle Rock Conglomerate overlying soft, erodible Dawson Arkose. (The same rock formation present at Bella Mesa)
- Since homes pre-date the proposed church expansion, the church was required to make “every effort to ensure that the expansion would not further destabilize the bluff.”
- Colorado Geological Survey and Douglas County were concerned that the proposed expansion would impose construction-related disturbances and vibrations that could increase the rockfall hazard.
- Post-construction runoff from the planned large roof and pavement areas could result in increased infiltration and seepage, further destabilizing the precarious blocks along the cliff.

Case Study in Castle Rock – St Francis of Assisi Church - 2008

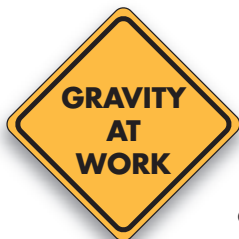
- Rockfall Study and Rockfall Mitigation Plan
 - Construction of a rockfall catchment trench.
 - Cable-lashing a large pillar
 - Scaling unstable rocks
 - Using rock bolts with wire mesh and shotcrete to anchor the larger areas of unstable rocks.

How does this apply to Bella Mesa?

- Bella Mesa is located on the same blocky Castle Rock Conglomerate overlying soft, erodible Dawson Arkose formation present at the church location.
- Past Rockfalls have occurred in the area.
- Church expansion did not include a basement.
- **Bella Mesa construction efforts will include blasting and home construction will include basements. These efforts can be expected to impose construction-related disturbances and vibrations that could increase the rockfall hazard.**
- Post-construction runoff from pavement areas could result in increased infiltration and seepage, further destabilizing the precarious blocks along the cliff.
- Bella Mesa impacts a much larger area of cliff

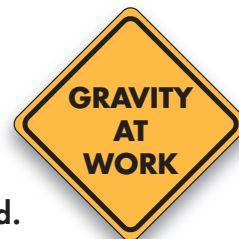
Recommendations

- Developer should work with the Colorado Geological Survey to conduct a rockfall investigation and hazard evaluation consistent with that completed at the church.
 - Study may include rockfall simulation utilizing Colorado Rockfall Simulation Program computer software.
 - Complete any required rockfall mitigation consistent with that completed at the church.
- Incorporate larger lot transition zone consistent with development immediately to the south. This combined with maintaining the currently planned setbacks could help mitigate some of the rockfall risk associated with construction



Rockfall in Colorado

Rockfall incidents will happen in Colorado, but in some cases rockfall can be avoided or mitigated. This issue of *RockTalk* covers the wide-ranging issues related to this geologic hazard.



A semi-truck collided with a fallen rock on Interstate 70 near Georgetown in April, 2004. Fallen rocks around bends in the highway or night-time rockfalls may not be visible to drivers, and can lead to accidents. (Photo by CDOT, 2004)



A large boulder the size of a small car was an uninvited guest at this residence in the Willow Springs area southwest of Denver. (Photo by LR Ladwig)



The large rock (right) fell from cliffs above before this home was built. A similar boulder falling on the house would do considerable damage; however the 1976 Big Thompson flood devastated the canyon and the house first. (Photo by V Matthews)



After parking near a rock cut along Clear Creek Canyon, the driver of this rental car returned from his afternoon rock climbing trip to a nasty surprise. Fortunately, no one was hurt; unfortunately, the motorist did not carry adequate insurance on the rental. (Photo by CDOT, 2006)

— See the back page for more rockfall photos —

From the Director, Vince Matthews—

A rockfall doesn't have to kill you to ruin your day.

You are much more likely to hit a rockfall, than to be hit by one on Colorado's highways. Although we all probably have concerns about a rock falling through the windshield of our vehicle, it is a much higher probability that our vehicle will be damaged by suddenly encountering rocks already lying on the roadway and not having time to avoid them.



The following is a personal example of how even a minor rockfall can be a hazard on Colorado's mountain highways: On the sunny afternoon of April 25th, 2006, I was driving over Monarch Pass on the way to delivering a speech in Gunnison. Descending the pass on the west side, I passed several cars with drivers blinking their headlights in an apparent warning. Having consequently slowed, I rounded a curve and saw the minor rockfall in the accompanying photo. I easily avoided the large boulder and straddled the small rocks on the center line. Unfortunately, being used to driving larger vehicles with high clearance, I forgot how low the clearance was on my MINI Cooper. I heard what seemed like a minor scraping as I drove over the smaller chunks of rock. Unfortunately, that "minor scraping" resulted in \$1,400 damage to the radiator and air conditioner. There certainly are many of these lesser, but impactful, rockfall encounters throughout the state that cause damage and go unreported.



It is important to be extra alert during three particular times on Colorado's highways: spring thaw, after heavy rains, and at night. Be particularly alert during these times where you are approaching a blind curve in the road.

Random Acts of Gravity? When Rockfall Happens

Gravity never sleeps in Colorado's Rocky Mountains! Gravity's constant pull is actively operating on rocks high on steep slopes. When these rocks (both large and small) become destabilized, gravity causes them to roll, slide, or fall onto adjacent valley floors. When people, buildings, vehicles, or highways are in the path, these rockfall events can lead to tragedy—property loss, personal injury, or even loss of life.

Falling rocks are a special category of the large family of gravitationally-driven phenomena called landslides. What are commonly called rockfall events generally fall into four technical definitions: rockfall, rock topple, rock avalanche, and rock slide. Obviously nature doesn't always follow our pigeon-hole classifications, so rockfalls commonly grade into one another.

Rockfall is the fastest type of landslide and is common in mountainous areas near cliffs of broken, faulted, or jointed bedrock, on steep slopes of rocky soils, or where cliffy bedrock ledges are undercut by erosion or human activity. The loss of support from underneath, or detachment from a larger rock mass destabilizes the rocks and gravity does the rest. The criteria for rockfall is simply an exposure of broken rock, gravity, and a slope steep enough that when a rock detaches or dislodges from the ground surface, it will move down the slope rapidly. Complex interactions between physical parameters of both the rock and the slope cause the falling rocks to move down the slope in a high-velocity, seemingly random and erratic manner.

By their very nature, rocks are heavy—and when traveling at 60 feet per second or more, their energy upon impact is frightful to consider. Rockfall events can instantly demolish structures and kill people unfortunate enough to be in their way. Even a single baseball-sized falling rock has the potential for deadly consequences (Figure 1).



Figure 1: Rockfall accident in Glenwood Canyon. This hand-sized rock free fell 300 feet before striking the vehicle. The driver was unhurt and, luckily, there was no front seat passenger. (Photo by Jon White.)



How and Why Rocks Fall

It is important to note that rockfall is a natural, catastrophic process that has been occurring in steep terrain for as long as Earth has existed. Although we often think of mountains eroding away grain by grain (and some do); more often they tumble down in a punctuated, but perpetual, sequence of rockfalls, rockslides, landslides, and debris-laden floods over millions of years. In other words, our beautiful Rockies are basically falling apart (Figure 2).

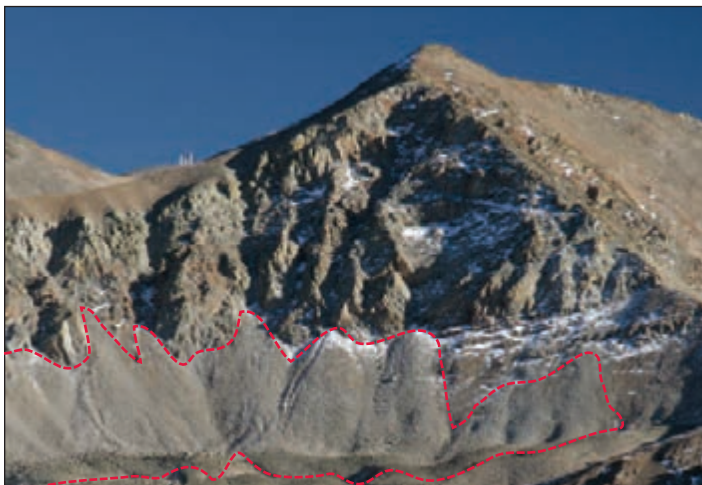


Figure 2: The large deposits of fallen rock comprising this talus slope (coalescing talus cones outlined in red) at the base of the steep slopes demonstrate that the mountain is slowly falling apart and depositing the cones in continuous episodes of sudden rockfall. West Dyer Mountain east of Leadville. Vertical relief is 1,200 feet. (Photo by Vince Matthews.)

Source Areas

Typically, **source areas** of rockfall are topographically high, hard-rock formations; and to a lesser extent, unconsolidated deposits (soil) containing large fragments of solid rock. Discontinuities (cracks) in the rockmass, such as joints, fractures,



Figure 3: Discontinuities (cracks and fractures, some shown with red lines) in a Precambrian gneiss outcrop near Evergreen, CO. Weathering processes continually work to break apart the rock mass. The fractures are obvious zones of weakness. The orientation of the fractures is important in assessing rockfall hazard. (Photo by TC Wait)

faults, and bedding planes, are exposed to weathering processes that weaken the rockmass (Figure 3). The vast majority of rock units have discontinuities, or cracks. The orientation, length (persistence), spacing, and general condition of these cracks make a big difference as to the overall stability of the rockmass.

A rockmass like a granite or hard sandstone is more resistant to erosion than soil or softer rock, such as mudstones, claystones, and shales. When softer materials are weathered and eroded away over time, these remaining resistant rocks create topographically high landforms such as mountains, ridges, and mesas. In the alpine areas of Colorado, glaciers created oversteepened valley walls by carving U-shaped valleys, cirques, and arêtes. These steep slopes are also now potential source areas for rockfall.

Table 1: Typical Forms of Rock Slope Failures Defined for the Purpose of this Discussion

Terminology	Relative Speed	General Definition*
Rockfall	Very rapid	Sudden dislodgement of a single or multiple blocks of rock of any size from a cliff or steep face, which descend in a relative free fall. Movement may be straight down, or in a series of leaps and bounds down the slope; it is not guided by an underlying slope surface.
Rockslide	Rapid	Sudden downward movement of an essentially coherent block or blocks of rock along some well-defined failure surface usually related to joints, fault shears, bedding, or preexisting structural feature surfaces. The moving mass is greatly deformed and usually breaks up into many small independent units.
Rock or Debris Avalanche	Rapid to very rapid	Movement of an incoherent mass of rock wherein the original structure of the formation is no longer discernible, occurring along a poorly-defined surface. Characteristic features include flow morphology, relative thinness in comparison to large aerial extent, and lobate form.

*Modified from Varnes, 1978 and AGI geologic glossary

Rockfall initiates from high outcrops of more resistant rock that becomes unstable for a variety of reasons. The size of the falling rock depends on the source area geology (bedding thickness, bedding dip and dip direction, hardness, joint/fracture orientation), weathering, position, and steepness of the slope (Figure 4).

Weathering & Undercutting

Mechanical weathering in the source area is the primary actor in causing rockfall. It is a process whereby the rockmass is mechanically split and wedged apart along the discontinuities by water as it freezes and expands. The pressure exerted by the freezing of water forces the crack a bit wider with each cycle of freezing and melting, a process called **ice-jacking**. Shales are composed of clay minerals that take in water mineralogically and expand, but then shrink later as they dry out. This causes slaking wherein small shale flakes continually pop off of the exposed shale bed, causing accelerated erosion and potential undermining of harder rocks above. Biological activity (plants and wildlife) can also widen rock cracks. Tree roots seek the water found in rock fractures and the relentless pressure of a growing root can also widen these cracks.

Chemical weathering is a relatively slow process as rock minerals chemically change, causing a general decomposition of the rock. Hard, resistant minerals in a rock can chemically alter to softer, less resistant minerals during weathering. Some areas become susceptible to rockfall because hot waters from underground have chemically altered and weakened the rock (hydrothermal alteration). Weathering can eventually force a once-stable rock into an unstable position where gravity finally pulls it down.

Erosional undercutting, where supporting soft layers underlying a jointed resistant rock are slowly removed, can also turn a once-stable rock into an unstable one that suddenly falls when enough of its support is removed and gravity prevails.

Excavations, such as road cuts or those made during grading activities for developments, can remove support for overlying or overhanging rock and create rockfall hazards. Construction on talus slopes, considered potentially unstable slopes, can increase rockfall risks to areas above and below construction by increasing or renewing ground movements within the talus. Heavy rainfall or wind can move rocks on steep slopes.

Physical Triggers

Triggers for rockfall include precipitation (water lubricates rock joints and fractures, weakens them, and causes them to slip and/or separate), increased ground water pressures (water pressure in the rockmass can hydraulically “lift” the rock and decrease the normal rock friction at discontinuities) temperature extremes (ice-jacking forces rocks apart during freeze/thaw cycles), chemical weathering (decomposition of rock), seismic (earthquake shaking, blasting), erosion and

undercutting (from rivers, glaciers, gullying, etc.), or adverse loading (snow loads, landsliding, etc.) that can loosen or overturn an unstable rock. Observers have even witnessed lightning trigger a rockfall in Colorado.

In addition to natural rockfall causes, source areas can also occur as a result of human activities such as steep cutslopes in rocky soils, oversteepened excavation in a rockmass with adverse properties, adverse drainage, and loading by structures. Occasionally, human activities can trigger rockfall or cause rocks to fall sooner than they would naturally. Vibration from roads or blasting can trigger rockfall, as can development-related changes in surface water and groundwater conditions. In Colorado, animals, even humans, can also dislodge rocks while burrowing, climbing, or walking in steep rocky terrain.

Runout Zones

The areas where fallen, rolling, or bouncing rocks accumulate are called **runout zones**. The size and shape of the runout zone depends greatly on the steepness of the slope, the size and quantity of the falling rock, and other factors like vegetation cover. A large quantity of loose fractured rock debris on a slope is sometimes called **talus** or **scree**. Talus on steep slopes is often the result of numerous small rockfall events. If the base of a slope or valley is littered with angular or block-shaped boulders and there is a high cliff up on the valley wall of the same rock type, then it is a rockfall runout zone (Figure 4).



Figure 4: Rockfall source area and runout zone from a rockfall that was triggered by a lightning strike. The whiter rocks indicate the fresh rockfaces of the most recent rockfall event; however the slope is littered with large rocks from older events also. (Photo by Vince Matthews.)

Rockfall in the extreme form is a **rock avalanche** that completely buries the existing ground. When a rockslide occurs with enough mass and long steep slopes, such as a flank of an entire mountain, it quickly becomes a catastrophic landslide. Figure 5 shows the 1991 West Lost Trail Creek landslide in the San Juan Mountains. This gigantic landslide began as a rock avalanche on the flank of Pole Creek Mountain and quickly grew into a large avalanche as it accelerated down the steep slopes to “flow” onto the valley floor.

Rockfall Rating Systems

Rockfall rating systems are used to assess the hazard and risk associated with a wide range of rockfall situations including highway and railway transportation corridors, commercial and residential real estate development, and the mining industry. Rockfall rating schemes typically employ two major themes: the objective *hazard* of the rockfall itself and the subjective *risk* associated with that hazard. Rating systems are used for large-scale corridor evaluations, and is generally not appropriate for individual homes or sites.

The *hazard* component can be thought of as the potential for rocks to fall and includes aspects of geology and slope geometry. Geologic characteristics considered in hazard assessment include rock type, degree of fracturing and jointing, the size of the individual blocks resulting from fractures and joints, the relative “smoothness” of the rock, the presence of water, and the degree to which the rock has weathered. Slope geometry includes the overall height of the rock face as well as the rockfall source area, the angle (steepness) of the slope, the presence of launching features which could cause a falling rock to bounce or tumble, the exposure of the slope to the elements of weather, as well as the size and shape of any catchment area (runout zone) at the base of the slope.

The *risk* assessment component of rockfall rating schemes is more variable and reflects the context of the slope with its anticipated human interaction. In the case of a roadside rockfall area, risk assessment is based on the notion of a



Figure 5: The July 1991 West Lost Trail Creek rockslide in Hinsdale County, Colorado. This estimated 10 million cubic-yard rock and debris avalanche began as a massive rockslide. (Photo from CGS archives.)

moving object in the rockfall zone and includes the amount of traffic, the speed of the traffic, and the sight distance available to drivers to avoid a falling or fallen rock. In the case of real estate, the risk component is tailored to that of a stationary object in the rockfall zone and includes aspects such as the location of the structure and its intended use, i.e. full time occupancy in the case of a residence, or scarce occupancy in the case of a utility building.

In order to characterize rockfall hazard areas and the risk associated with those areas, the many parameters of objective hazard and subjective risk are numerically rated and mathematically combined to produce the overall rating for the site. The method by which these components are combined is dependent on the context of the situation. In some cases the hazard and the risk are equally weighted, and in others one component may be more heavily weighted to produce a rating that is appropriate for the specific situation.

Slopes prone to rockfall are highly varied and so their assessment scheme needs to produce some means of comparison between areas and delineate hazard versus risk. A slope may be composed of highly fractured and crumbly old rock, but is located in such a way as to present no risk. Another slope may be composed of more “competent” rock, but is located directly above someone’s

home or a highway with very high traffic volumes. Which slope deserves more attention? Rockfall rating schemes allow rockfall areas to be compared to each other on an “apples to apples” basis.

Rockfall Investigation and Mitigation

Geologic forces have given rise to the beautiful landscape that is Colorado and part of that beauty is its high elevation and high relief. Rockfall-prone slopes are a part of this landscape, but we, as humans, need to be smart about how we interact with it. By studying rockfall events and understanding the terrain where they occur, geologists, engineers, and local decision makers can work to improve development planning by avoiding high risk rockfall areas, and providing rockfall protection and mitigation in lower risk areas.

Because steep slopes are more difficult to develop, many areas with rockfall hazards have historically been avoided except by road construction; however, as growth continues throughout the mountains and other steep slope areas in Colorado, more areas are being developed within potential rockfall hazard zones. Many mountain towns of Colorado are exposed to rockfall hazards, some of which are high risk and potentially very dangerous. Planning for avoidance or mitigation of the rockfall hazard is crucial in these areas.

Colorado Highways and Rockfall

CDOT has a Rockfall Program that is tasked with identifying, assessing, and mitigating rockfall hazards along Colorado's state highways. Colorado's mountainous terrain and variable geology combine to produce substantial challenges in terms of keeping rocks off the road. One doesn't have to spend much time driving in the mountains to notice the many rocky slopes along the side of the road. Given these many thousands of roadside rock slopes, which present the greatest risk to the traveling public?

CDOT uses a rockfall rating system to rank and prioritize roadside rock slopes for mitigation (See "Rockfall Rating" on page 5). As a first step, every Colorado highway was driven and a cursory visual inspection of the adjacent slopes was made by a geologist evaluating slope geometry and geologic character. This information was combined with traffic data and past rockfall activity at specific sites, as identified in interviews with CDOT maintenance personnel and state patrol accident reports. The combined data allowed CDOT to categorize the slopes into a qualitative ranking of high, medium and low rockfall risk. Of the thousands of roadside rock slopes in Colorado, approximately 750 were ranked as having a "high" rockfall risk. These slopes were then inspected and rated according to a more rigorous rockfall rating scheme. Periodically, these slopes are re-rated to reflect changes in road construction and traffic volumes. The ratings are then used to prioritize rockfall areas according to their relative risk.

Today, CDOT's Rockfall Program is focusing half of its funding for rockfall mitigation along I-70 at Georgetown Hill, which is a unique situation in terms of rockfall hazards and traffic volumes. The Georgetown Hill corridor has had several rockfall accidents over the years, some of which have resulted in fatalities. The slopes adjacent to Georgetown Hill are extremely long and steep and the rockfall source areas can be up to 2000 feet above the highway. Rocks falling from these source areas can attain very high velocities (in excess of 70 mph) and impact the roadway with significant force. This part of Interstate 70 lies between Denver and the major ski areas or other recreational destinations in the Colorado mountains, so traffic volumes can be extremely heavy.

Rockfall along a highway presents a unique problem, in that a rock falling directly on a moving car is relatively rare, although it does sometimes happen. More often the rock falls onto an empty highway and then a car comes along and runs into the rock, causing damage to the car and injury to the occupants.

Another aspect of roadside rockfall is that many of the rockfall source areas are old cut slopes that were excavated into the mountainside to facilitate the preferred, most cost-effective, road alignment. In the past, rock blasting for road alignments was uncontrolled and resulted in what is called overbreak; the damaging cracking and fissuring of the rock face by the explosive energy of a blast. Some of these damaged rock faces, blasted years ago and exposed to 50 to 100 years of weathering, are a problem. Road construction methods have evolved in recent years to the point that blasting techniques to excavate rock slopes allow considerably more predictable results and create much less fracturing of the remaining rock slope. For all new highway improvements, rockfall potential and the long-term behavior and stability of an excavated rock slope is taken into consideration early in the project design stage, and mitigated during construction. CGS often works with CDOT to assess and study the rockfall potential on highway projects.

Identifying Potential Rockfall Hazard Areas

Specific rockfall occurrences are very difficult to predict, but it is possible for a geologist to identify areas that are prone to rockfall events, and to make judgments on the level of hazard and the level of risk to human development. Identifying areas that may be affected by rockfall involves looking at a number of geologic and topographic factors.

Before going into the field, the geologist might conduct an analysis to pinpoint where steep slopes are located. A geologist will examine the overall topography of the terrain to determine areas with enough relief and steep slopes that would allow gravitational forces to create rockfall. The types and condition of rocks and materials on or above a slope are evaluated to determine which formations might produce a falling rock. Slopes, vegetation, and valley floors are inspected for evidence of past rockfall activity. Current land use and human activity are also considered by the geologist, because these may enhance natural conditions for rockfall, or even directly induce rockfall. All of these factors are considered in order to determine whether any mitigation or protective measures should be developed.

Colorado Rockfall Simulation Program (CRSP)

One example of a useful tool in assessing and modeling rockfall hazard is the Colorado Rockfall Simulation Program (CRSP). This computer program allows the user to simulate a rock

rolling down a slope and to predict the speed and bounce heights of the rock. The CRSP software was first developed in 1988 by researchers at the Colorado School of Mines and the Colorado Department of Transportation (CDOT)



Figure 6: Documentation and user's manual for the Colorado Rockfall Simulation Program, version 4.0, available from the CGS.



who recognized the need to model rockfall during the I-70 Glenwood Canyon Construction Project. The Colorado Geological Survey (CGS) assisted CDOT with monitored rockfall testing that provided empirical data for CRSP calibration. The program is recognized worldwide as a useful and valuable tool for analyzing rockfall hazards and preparing mitigation designs.

CRSP has been revised and re-calibrated in later versions. Today, CRSP Version 4.0 is the current version available. CGS sells the program and a user's manual for \$25 through the CGS online bookstore (<http://dnr.state.co.us/geo/store/Search.aspx?Keyword=CRSP>) (Figure 6). Stay tuned, though. The CDOT Rockfall Program is financing the development of a wholly revised CRSP that should be available within a couple of years.

Instrumentation and Monitoring of Rocks in Source Areas

A wide variety of different types of tools are available that can measure the movement of an unstable rockmass or large block of rock. Some of these methods are extremely sensitive and can measure not only rock movement, but the expansion and contraction of rock as it warms in the sun and cools at night. Instrumentation and monitoring of large unstable rock features is prudent in many circumstances because observations show that rock movement usually accelerates prior to ultimate failure (i.e., sliding, toppling, etc.)

Some of the methods can be very simple but still effective. Crack gauges and other "tell-tales" are simple devices that are generally affixed to a rock face spanning a fracture or other discontinuity in the rockmass (Figure 7). As the rock moves, a gap begins to show between the two indicators that can be measured. A drawback of these old-fashioned types of devices is that they need to be visited to be read, not a pleasant thought if the crack gauge is anchored up on a 600-foot cliff and it's winter time.

Electronic devices are more sensitive than simple physical indicators and are able to report millimeters of movement, but are more complicated.



Figure 7: Close up view of tell-tale gauge. Two steel rebar segments (shown with arrow) have been cemented into small drill holes above and below a large crack in the rock. Any movement could be measured by the offset of the two bars that were touching when cemented. This rock has not moved since the gauge was installed in 2003. (Photo by Ty Ortiz, CDOT.)

Simple circuit tools can span a rock crack and initialize a warning if the circuit is broken when the crack widens. More complex transducers that measure frequency fluctuation in vibrating wires are used in crack or joint meters, tilt meters, and extensometers (Figure 8). These devices send electronic sig-

nals through cables that can be connected to a data-logging computer and telecommunication system. These systems allow near real-time observations of rock movements from any location with a computer (or a mobile device such as a Blackberry) and an internet connection.

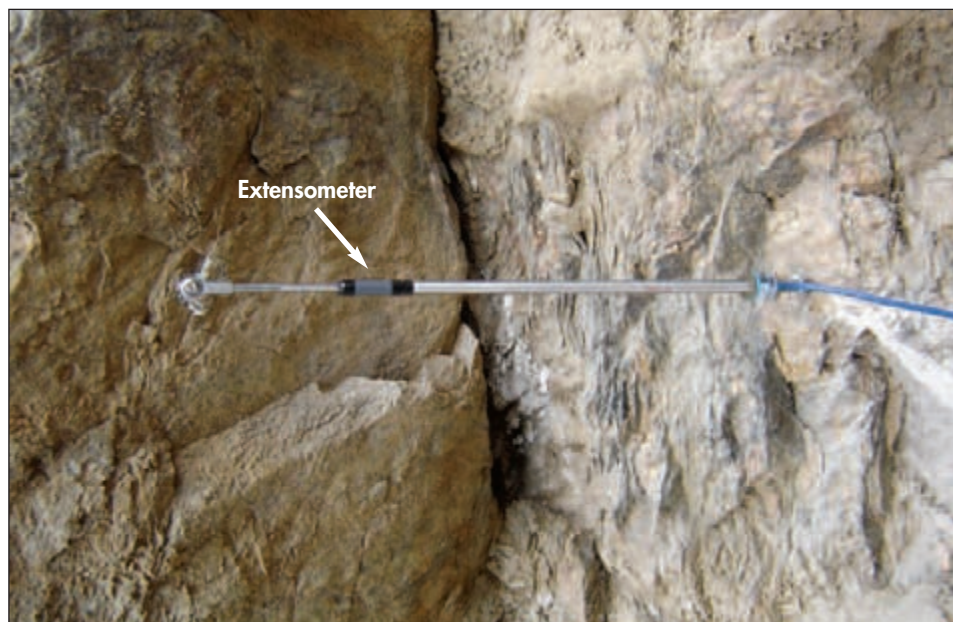


Figure 8: Close-up of a crackmeter sensor anchored across a rock joint near Idaho Springs, CO. A crackmeter is mounted to posts that are grouted into drill holes on each side of the rock crack. (Photo by Ben Arndt, Yeh and Associates, Inc.)



Figure 9: Installation of target prism anchored to a cliff to measure rock movement. Prism is screwed into a wedge anchor bolt that is installed into a drill hole. (Photos by Jon White.)

Survey equipment is also commonly used to monitor rocks and rockmasses. Target prisms or other reflectors can be affixed to a rock face (Figure 9) and periodically measured with a laser surveying instrument. More advanced survey equipment, called laser scans or 3D scans, has entered the market in recent years. These laser-distance tools “sweep” a rockface and the return laser beam scatter is measured and deciphered as 3D points in space. Thousands of these points create a three-dimensional “point cloud” that depict an accurate image of the rockface (Figure 10). Each sweep of the tool generates new 3D points at the same location. Each successive reading is compared to previous readings, and software can measure incremental movements of the rock face.

The electronic and survey data is plotted on graphs showing rock movement over time. Trends can be established that show no movement, steady state creep, seasonal fluctuations, and/or diurnal movements. If the rate of movement begins to increase markedly, then responsible entities can

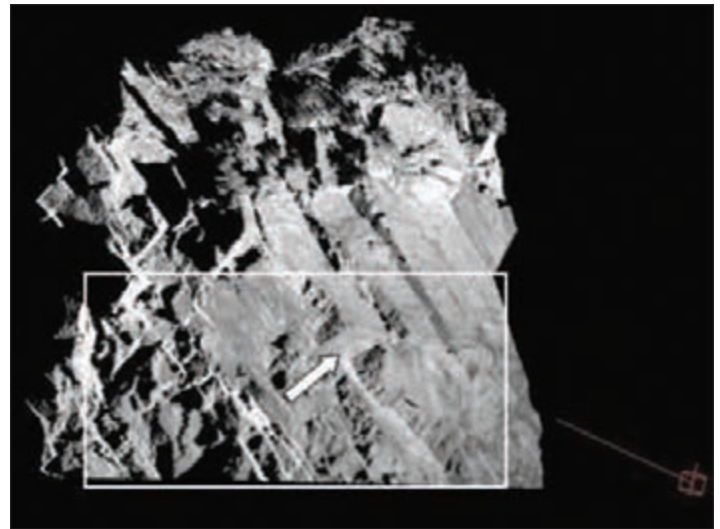


Figure 10: Point cloud generated by laser scan of rock face. These scans are capable of detecting minute changes of 3–10 millimeters in a rock face. The arrow points to the rock overhang that was of interest to CDOT in the survey. (Image courtesy of Ty Ortiz, CDOT.)

be notified to start further investigation, mitigation design, and mitigation construction as necessary. Electronic monitoring and real-time data collection can also be configured as an early warning system.

When a site has been identified as being exposed to rockfall hazards, there are three primary categories of mitigation alternatives: 1) avoidance of the hazard, 2) protection from the hazard, and 3) rock stabilization and slope-support techniques that include either removal of hazardous rock features and/or reinforcement of the rockfall source area. The mitigation design approach chosen is always dependant on a site-specific geologic investigation of the hazard area, access availability, and the economic reality for the type of structure(s) or land use proposed versus engineering and mitigation costs. In many situations, the final mitigation design is a combination of specific schemes from all three categories.

Avoidance

Avoiding the rockfall hazard area is the most basic method, albeit oftentimes the most difficult to accomplish. If land-use master plans are carefully prepared (by county and city governments) and in effect prior to development, high-risk areas can be designated as no-build zones, and therefore off limits to development. In the case of a pre-existing development or structures, the only other avoidance alternative is to move the structure out of the hazard zone, which is usually very problematic and costly, and therefore, rarely done. In the case of a new roadway, the planned road alignment simply avoids a rockfall hazardous zone. For existing roadways, moving the road alignment during highway improvement or widening projects, or by relocating the road into a tunnel, can often avoid the hazardous areas. Typically, avoidance of the hazard is the least expensive mitigation alternative when planning new construction or road alignments, but it is one of the most expensive for existing structures.

Protection

Protection concepts accept that rocks will fall in a hazardous area, but structures and roadways can be acceptably shielded from rockfall, or sufficiently reinforced to withstand the impact without adverse damage or loss of functionality. Rockfall protection designs come in many forms. Rockfall barriers are designed to stop falling or rolling rocks. They can be constructed in the form of a large earthen wall or berm, or specialty fences built with strong, steel cable netting. Earthen barriers often include a ditch in back to provide extra space to accommodate falling and rolling rocks and associated debris. A good example of both earthen rockfall berms and impact walls is at the Booth Creek rockfall site in Vail. Photos of these barriers are shown in the case history article. Rockfall fences can be seen at many locations around the state, the most notable of which can be seen alongside and above Interstate 70 on the Georgetown Hill (Figure 11). Rockfall fences are well suited in rugged terrain and very steep slopes where impact walls and rockfall catchment ditches are not feasible. Another method of protection from rockfall is constructing a rockfall shed over the road or structure, similar to an avalanche protection shelter. This technology is the most expensive protection option, but is well suited to locations where rockfall is consistently severe, and where other protection devices would likely fail under repeated rockfall events.



Figure 11: Wire rope rockfall fence installed on a rock slope at Georgetown Hill above Interstate 70. Exit ramps shown in the upper part of the photo are for the Silver Plume Exit. (Photo courtesy of Ty Ortiz, CDOT.)

Rock Stabilization

Rock stabilization is a common form of rockfall mitigation. Stabilization and controlled removal of loose or potentially loose rocks improves both the risk of falling rock and the exposed rock's ability to support itself. Removing a potential rockfall before it becomes a falling rock is the most direct way to address rockfall hazards. Removal may be as simple as knocking down loose rocks with a crowbar (known as scaling) or may consist of drilling, loading explosives in the hole, and blasting down potentially unstable rock features. Reducing the grade of a rocky slope (laying the slope back) will improve slope stability and can also prevent rocks from detaching from



Figure 12: Installation of rockbolts on the rocky slope of Glenwood Canyon during the Interstate 70 highway construction project in 1991. The worker is spinning an epoxy-coated steel bar into the drill hole using a pneumatic drill. The protruding bars in the foreground (shown by arrows) are installed rockbolts. (Photo by Jon White.)

the rock outcrop and rolling down the slope. This technique was utilized at the large rockslide in Clear Creek Canyon in 2005. Removing the hazard is oftentimes difficult to accomplish where there are existing structures nearby that may be threatened or damaged in the process.

Stabilization of rockfall prone slopes is another preventive mitigation alternative. These methods are generally mechanical techniques that improve the strength of the rock and prevent failures along discontinuities, as explained in the overview article of this *RockTalk* issue. These techniques can be subdivided into techniques that further stabilize the rockmass internally and those that support the rock at the surface.

Rock bolts, or dowels, are long steel bars that are cemented into drill holes in the rock with a concrete or epoxy-like mortar (Figure 12). Many times these rock bolts are tensioned with a hydraulic ram and then a nut is tightened at the surface to lock the bolt, which puts the rockmass in compression (forces the rock together) and applies additional frictional forces at the discontinuity surfaces they cross, which counteract gravitational forces and hold critical planar or wedge

“key blocks” in place. Many highway rock slopes have rock bolts in them. The only evidence at the surface is a small steel plate and a nut exposed on the rock face (Figure 13).

Because water in cracks can cause rocks to weaken and fail, it is common to drill inclined holes into the rockmass to allow better drainage of any water-filled fractures and thus stabilize the rock inexpensively.

Another emerging technology to stabilize rock slopes is through the use of an injected polyurethane resin. Holes are first drilled into the rock, and then a two part resin, similar to common epoxy, is injected into the rock. The resin hardens after a short time and the interior of the fractured rock is essentially “glued up” and held in place.



Figure 13: Pattern rock bolting to reinforce the rock cut along Highway 285. The threaded steel bars have been cemented into drill holes. The external evidence of rock reinforcement is shown by the steel plates and large nuts, four of which are indicated with arrows. (Photo by TC Wait.)

Surface retention of an unstable rockmass includes anchored concrete buttresses (Figure 14), and wire mesh (similar to chain-link fencing) or cable netting, either anchored to the rock face or draped down on a rock slope (which serves to redirect a falling rock into a ditch). Occasionally, large rocks can be stabilized by cable lashing, which also serves to hold the rock in place. Cable lashing is often employed to protect existing structures and roads from precariously balanced rocks that are too dangerous to remove or too unstable to drill into (Figure I, page 17). Another form of surface retention of rock is shotcrete, which is the pneumatic spraying of concrete onto a rock face or cut slope. Shotcrete can be very effective when applied on cut slopes in rocky soils (Figure 15) and in poor rock conditions such as slaking shale slopes that are undermining more resistant rock above.

Figure 14: Smaller, upslope concrete buttresses are anchored to the rock face with rockbolts. Then, concrete rebar and wood forms are wired to the anchors in Glenwood Canyon. The concrete is carried in mud buckets by helicopter. The three photos show the progression of the installation. (Photos by Jon White.)



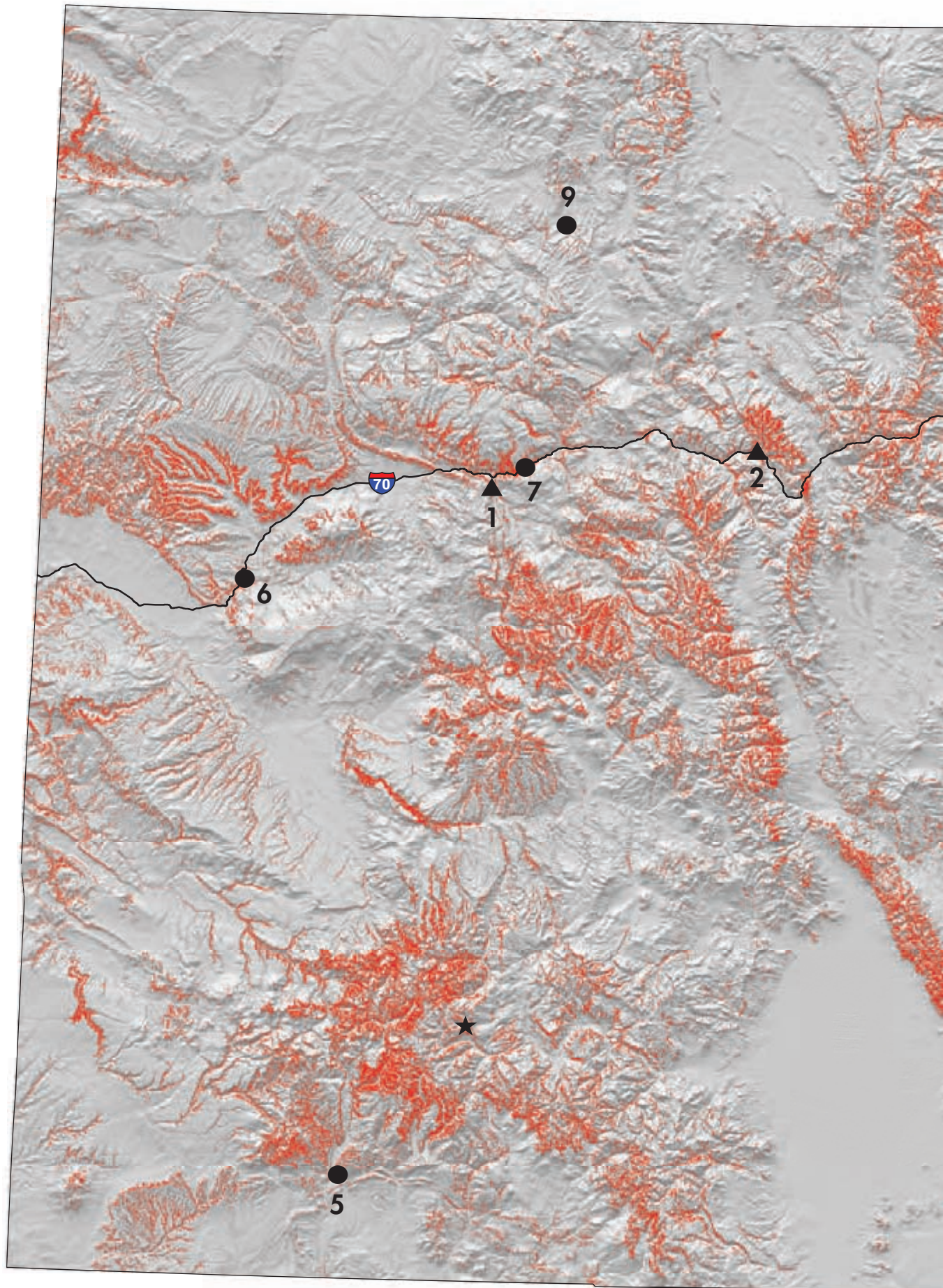
Figure 15: Application of shotcrete at a raveling cut-slope exposed in a rocky talus chute. The concrete has been dyed dark brown to better match the surrounding area. (Photo by Jon White.)

In most cases, rockfall mitigation is designed to incorporate a combination of these techniques. Common highway mitigation project scenarios include first removing loose rock by scaling and sometimes blasting, then reinforcing rocks with anchors that are installed and tensioned to improve the overall rockmass stability and prevent larger rockslide failures, then draping wire mesh or netting over the slope to control and direct smaller rock fragments that will loosen over time to fall between the mesh and the cliff face, and finally constructing a suitable containment ditch at the highway shoulder to retain these smaller rock fragments that may fall.

The Role of CGS in Colorado's Rockfall

One of the primary missions of the Colorado Geological Survey is to help reduce the impact of geologic hazards on the citizens of Colorado. To act in accordance with that mandate, the Colorado Geological Survey responds to Colorado's rockfall hazards in many ways:

- Emergency response to rockfall events when they occur throughout the state;
- Providing rockfall investigations and hazard evaluations to other state agencies and departments;
- Identifying and mapping specific areas of rockfall hazard in cooperation with local government planning agencies and the Colorado Division of Emergency Management;
- Recently completing rockfall hazard maps for the towns of Estes Park, Evergreen, and Colorado Springs;
- Providing the popular Colorado Rockfall Simulation Program computer software, including the user's guide, at government cost;
- Helping county and municipal planners and developers to identify and avoid, or mitigate hazardous areas through our land use review program;
- Providing comment and guidance for proposed rockfall mitigation;
- Providing educational resources, such as this issue of *RockTalk*, so that the people of Colorado can better understand rockfall and the risk associated with living in and traveling through mountainous terrain.







Rockfall Case Histories

The following case histories illustrate the hazards associated with rockfall areas and the resulting complexities and difficulties involved in land use planning and rockfall mitigation efforts. The locations of these sites are shown in the accompanying map of Colorado (preceding page). In most of these examples, the threat and high risk of rockfall was not appropriately addressed during the planning and building of homes in rockfall runout zones. Only after significant and repeated potentially lethal rockfall events, or later geologic hazard investigations was the threat fully understood and taken seriously by residents, developers, or local planning agencies. Simple avoidance of hazardous areas would have solved the rockfall problems in these situations.

Glenwood Springs

The town of Glenwood Springs in west-central Colorado lies at the confluence of the Roaring Fork and Colorado Rivers. The town is tightly constrained by the steep river valleys so land-development pressure is causing more residential growth to advance into rockfall hazard areas. In West Glenwood, on the west side of the Roaring Fork River, the valley is rimmed with sandstone outcrops (Figure A). The sandstone layers are being undercut by the erosion of underlying softer siltstone and shale so that large sandstone blocks are being actively undermined and destabilized. In this area, there have been several large rockfall events from the valley rim; some that have severely damaged homes on the valley floor, 1,100 vertical feet below (Figure B). Fortunately, there have been no injuries or fatalities. Rapids in the river are evidence of continuous rockfall over many centuries. While there has been rockfall mitigation in some locations (Figure C), the threat remains in other areas.

Figure A (above): Valley rim west of the Roaring Fork River in Glenwood Springs looking north towards the confluence with the Colorado River. Note slumped (tilted) sandstone blocks in the exposed rock layer. Some of the rock blocks shown in this picture from 1994 have now fallen/rolled to the valley floor. (Photo by Jon White.)



Figure B: In April 2004, this rock from the source area shown above smashed through the wall of a home and came to rest against an easy chair. The homeowner built a rockfall protection fence afterwards. (Photo taken in 2004 by Steve Vanderleest, City of Glenwood Springs.)



Figure C: This newer development in west Glenwood Springs constructed a rockfall impact wall above their townhomes to protect against both rockfall and mudslides (debris flows). (Photo by Jon White.)



Booth Creek Rockfall Events

Another example of a rockfall hazard and high risk affecting a neighborhood is in East Vail at Booth Creek. The north valley wall of Gore Creek is benched with two high rock cliffs. Above the two cliffs, the 1,100-foot high valley rim is composed of an eroding slope of glacial till, which is also composed of very large rocky material. All three of these areas periodically release large rocks. After several repeated, potentially lethal, rockfall events that damaged several homes in the early to mid 1980s, CGS was asked to provide assistance to the Town. The neighborhood created a special Geologic Hazards Abatement District (GHAD) affiliated with the Town of Vail. The GHAD funded a rockfall hazard study that included a mitigation design. The construction of a rockfall catchment ditch and berm above the homes on the valley slope was completed in 1990 (Figure D). Owners of adjacent condominiums elected to not participate in the GHAD, and that poor judgment was brought into sharp focus in March, 1997. Another large rockfall event fanned down the slope toward the residential areas at the property line between the homes and condominiums. The existing rockfall ditch and berm was 100% effective in catching the rocks, but several rocks impacted the unprotected condos (Figure E). After that incident, which luckily resulted in no fatalities, the condominium homeowners association petitioned the town for their own mitigation. In 2001, specially designed impact barriers (Mechanically Stabilized Earth wall) were constructed on the slope behind the condos to provide a similar level of protection (Figure F).

Figure E (center row): Stunned condo occupant looking at exterior wall of her bedroom. Luckily, she wasn't home at the time of this event. The boulder demolished her bedroom crashing through two interior walls and the floor. The 5-foot boulder came to rest in the basement. (Photos by Jon White.)

Figure F (right): Three impact walls were built after the 1997 event to mitigate the threat of future rockfall at the condominiums. (Photo by Jon White.)

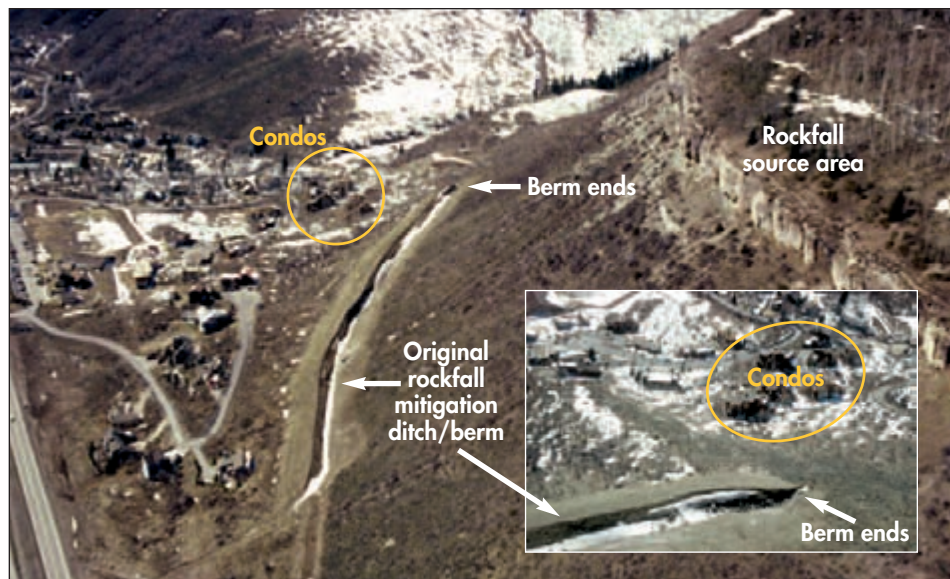


Figure D: Oblique aerial view, looking west, of Booth Creek debouching onto the Vail Valley floor. Interstate 70 highway is shown on the far lower left of the photo. The ditch and berm completed in 1990 is shown left of center. The termination of the berm and continued rockfall-hazard exposure of the condos (circled in yellow) is shown in the inset photo. (Photos by Jon White.)



St. Francis of Assisi Rockfall Site, Castle Rock

The Colorado Geological Survey extensively studied the site of St. Francis of Assisi Church in Castle Rock after a block detached from the upper cliff face in January 1981. The block presented a risk to homes at the base of the slope south of the church, and was broken up using passive demolition methods. Other detached blocks continued to present a rockfall hazard to six homes located at the base of the bluff (Figure G). No consideration was made to address rockfall hazards at the base of the slope when the homes were originally built.

The church is planning a major expansion, and in 2005 CGS was asked by Douglas County to review the church's development plans. The church sits atop a bluff that is composed of hard, blocky Castle Rock Conglomerate overlying soft, erodible Dawson Arkose (a type of sandstone). Tension fractures in the cap rock conglomerate indicate that large blocks are actively detaching from the cliff face, and large fallen blocks are present on the slope below. Some of these large rocks have even been incorporated into the landscaping of homes below the bluff.

However, since the homes pre-date the proposed expansion, the church was required to make every effort to ensure that the expansion will not further destabilize the bluff. CGS and Douglas County were concerned that the proposed expansion would impose construction-related disturbances and vibrations that could increase the rockfall hazard. Post-construction runoff from the planned large roof and pavement areas could result in increased infiltration and seepage, further destabilizing the precarious blocks along the cliff.

A rockfall mitigation plan was developed for the site. The mitigation plan included (1) constructing a rockfall catchment trench, (2) cable-lashing a large pillar, (3) scaling unstable rocks, and (4) using rock bolts with wire mesh and shotcrete to anchor the larger areas of unstable rocks. The mitigation was completed in September 2008.

Figure G: St. Francis of Assisi Church in Castle Rock. Fractures in the cliff and large fallen blocks on the slope above these homes indicate an active rockfall zone. Red lines are property boundaries. (Photo from Douglas County Planning Department.)



Manitou Springs 1995 Rockfall Threat

Manitou Springs occupies a narrow valley where Fountain Creek emerges from the foothills northeast of Pikes Peak and west of Colorado Springs. The valley slopes are composed of interbedded resistant sandstone and conglomerates (i.e., gravelly sandstone), and weaker mudstones and shale. The outcropping sandstone is most prevalent on the steeper slopes on the north side of the valley.

During the wet Spring of 1995, incidents of rockfall and landslides increased throughout Colorado, some of which resulted in fatalities. In Manitou Springs, a fortunate set of circumstances occurred before the Memorial Day holiday weekend when local residents observed the movements of a large, dangerous block of rock before it could fall. This set into motion an emergency declaration by the town, which resulted in the compulsory evacuation of homes that were located below the rocky slope, the closing of the road in the area, and an immediate rock stabilization project. During this emergency situation, the Colorado Geological Survey was asked to provide assistance to the town to help stabilize the rock. The emergency evacuation decree remained in effect until the rock was stabilized and the area was declared safe.

A prominent 12-foot-thick ledge of strongly-jointed sandstone forms the rim of this slope. Two essentially vertical and intersecting joint sets produce large orthogonal sandstone blocks that are being undermined by the more easily weathered mudstone beds below the ledge. The blocks begin to topple as the underlying rock that supports them erodes, creating dangerous overhangs. At the time of discovery, this particular block had moved 5.5 feet from the back face of the sandstone ledge and tilted precariously over the next sandstone ledge below. Had the 70-ton block fallen, it would have certainly crushed a home below.

The extremely unstable, tilted, rock could not be removed due to the prox-



Figure H: A precarious rock above Manitou Springs started to move in 1995 after a period of wet weather. As an emergency measure, high-strength steel cables were wrapped around the rock and anchored to the surrounding ledge to arrest the movement. (Photo by Jon White.)



Figure I. After the rock was stabilized, additional cables were physically attached to the top of the rock block and secured to surrounding stable rock. (Photo by Jon White.)

imity of homes directly below, so high-strength steel cables were wrapped around the rock and anchored to the surrounding ledge (Figure H). Once the block was safely restrained, additional cables were

physically attached to the top of the block at anchor points that were cemented into drill holes to provide an additional level of support for the block and safety for the homes below (Figure I).

Large Rockfall Events in Colorado

For most of us, our immediate experience with rockfall events are encounters with minor episodes that leave small rocks lying on a highway before a maintenance patrol removes them. Media often report some of the larger rockfalls when a major highway is temporarily closed, a vehicular accident occurs, or a fatality results from the rock impact. Discussed below are some of the larger rockfall events and rockslides that have recently occurred in Colorado. Not all are along Colorado highways. Most are natural events, but some are caused by human activity. These large rockslides can be very dangerous because of the major impact on the terrain below when they fall. The common theme in the following examples is a rocky rim of a steep-walled valley or canyon, and/or a high cliff face of exposed bedrock. The following recent, large rockfall examples are located on the map of Colorado in the center of this *RockTalk*.

Animas Valley Rockfall

On July 5, 1998, a large rockfall event occurred about 4½ miles north of Durango along the cliffs marking the east rim of the Animas River Valley. Over 50,000 cubic yards of rock detached and toppled from the sandstone cliff face. The falling rocks rolled and slid down the valley wall to crash into lower bedrock outcrops where they came to rest in a narrow cleft in the cliff face. The cliff of the valley rim consisted of an angular promontory edge that was being actively undermined by the erosion of weaker shales below. Over time, fissures began to open along vertical rock joints that were 30 feet behind the cliff face. These fissures, roughly parallel to the cliff face, became increasingly separated from the hillside. Before the failure occurred, they had widened to the point where there was over three feet of separation. The rockfall event occurred over the July 4th holiday weekend just days after landowners on Missionary Ridge had visited the cracked edge. The landowners had videotaped the cracks and detached rocks, with family mem-

bers even jumping back and forth, across them onto the detached rock block.

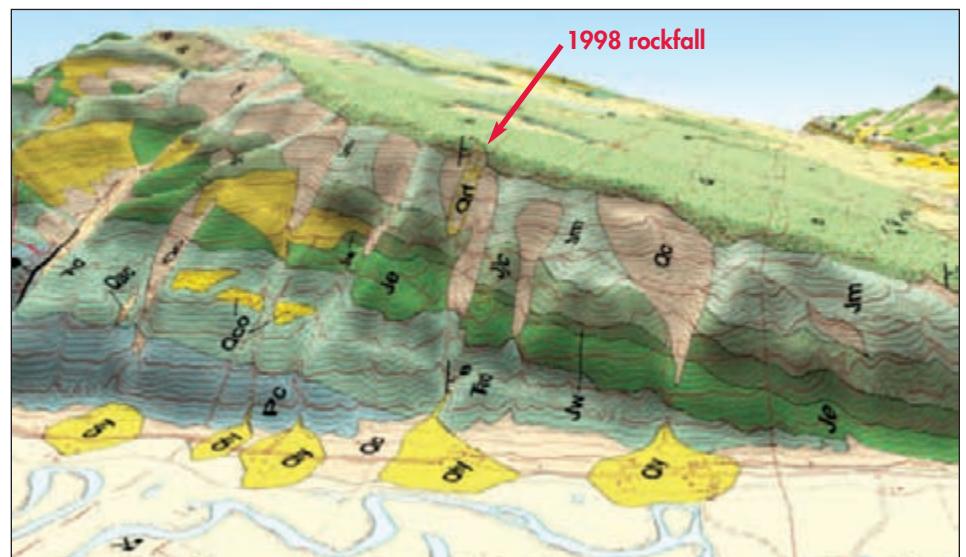
The rockfall scar is quite visible from Durango (Figure A). Fortunately the falling rock did not reach the valley floor where homes are located so no injuries or fatalities occurred. When it fell and crashed down the valley side, a plume of dust was created that completely filled the valley. At the time of the rockfall, CGS geologists were mapping the area and immediately responded by assisting La Plata County's assessment of the rockfall event.

Future geologic hazards related to this event include additional rockfall and the re-mobilization of the already fallen rock debris during intense rainstorms. The rockfall debris is composed primarily of sandstone blocks (up to 40 feet in length) with minor amounts of shale, silt, and clay that could become re-mobilized and carried down the narrow drainage and deposited on the alluvial fan on the eastern valley margin (Figure B). Based on recommendations made by CGS, county officials have assisted landowners living on the fan with the construction of a new channel to divert runoff away from their homes. To contain rock material from spilling out of the channel during mudslide (debris flow) events, below-grade catchment basins were constructed at the head of the fan, and both sides of the channel bank were bermed. In November of 2008, renewed activity on the upper rock face and large blocks of rotating rock were observed and are being closely monitored by the County.



Figure A: Aerial view of the Durango rockslide in 1998. White cliff at the top is the Dakota Sandstone and Burro Canyon Formation. Slope with the rockslide scar is the Morrison Formation. Lower red cliffs near the valley floor are the Entrada Sandstone and Dolores Formation. See geologic terrain model in Figure B. (Photo courtesy of the CDOT Aerial Reconnaissance Unit.)

Figure B (below): Terrain model of the east side of the Animas River Valley north of Durango, draped with the 1:24,000 scale CGS geologic map. The rockfall event of July 5, 1998 is shown as the deposit Qrf. (Created with 10-m DEM from USGS; geology by Carroll and others, 1999).



The Historic DeBeque Rockslide

The active landslide (Figure C) at milepost 51 of Interstate 70, 36 miles east of Grand Junction, began its life as a massive rockslide. A large, 900-foot long, 300-foot high, and possibly 400-foot wide chunk of the sandstone cliff that had fissured from the southern canyon wall in the recent geologic past, finally fell into the Colorado River. The date of this rockslide is uncertain but the event occurred prior to 1910. It is documented that the rockslide, with rock blocks the size of small homes, partially dammed the river and pushed the river course north towards the opposite bank. The historic records mention that part of the railroad was washed out, as well as a peach orchard and structures at Tunnel, a work camp that was located across the river from the rockslide. Fortunately, there was no road on this side of the canyon at the time of the rockslide. The entire fissured sandstone cliff did not fall, however. A remnant of the upper block in front of the fissure still remains and continues to creep towards the river and Interstate 70. This continued movement is monitored by the Colorado Geological Survey for the Colorado Department of Transportation.

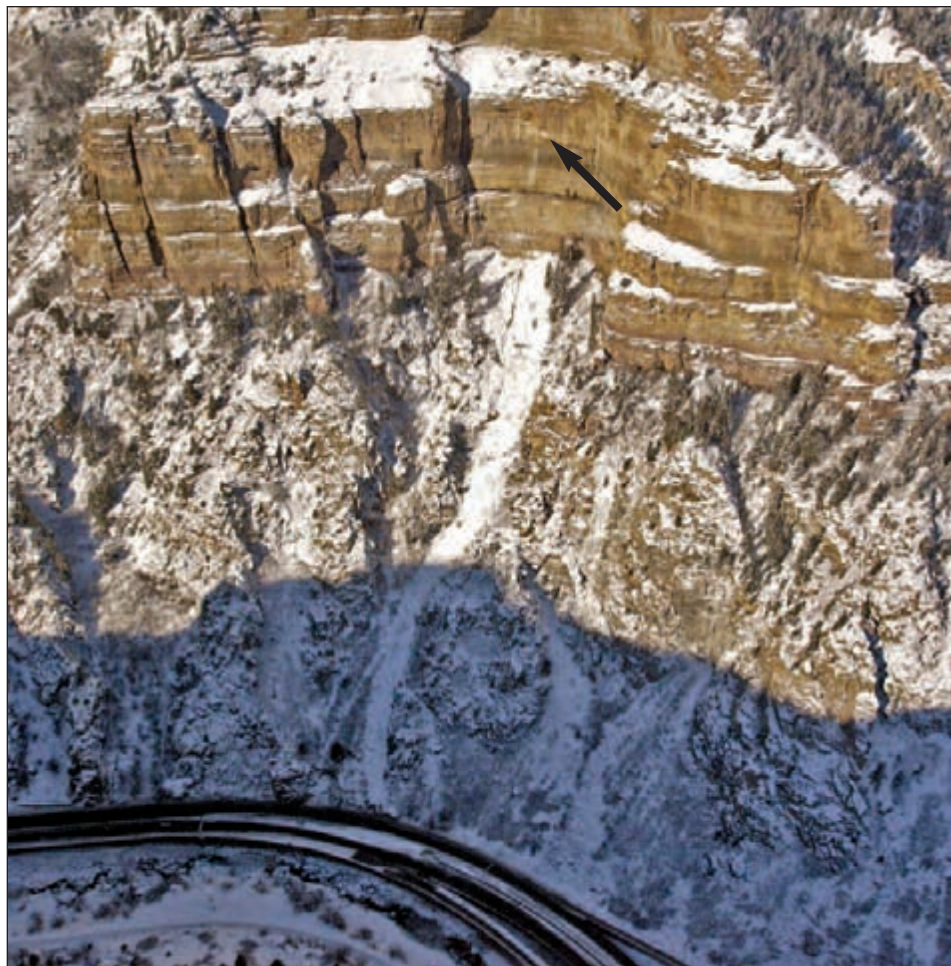


Figure D: The Thanksgiving 2005 rockslide area in Glenwood Canyon. Detachment location of rockfall is shown by black arrow. This 600-foot thick cliff of Sawatch Sandstone lies over Precambrian basement rocks at a major nonconformity. The rockslide path is well marked by the snow-filled chute in the underlying Precambrian rocks. (Photos by Ty Ortiz, CDOT.)



Figure C: Oblique view of the DeBeque Canyon rockslide. Note the large blocks in the rubble and how the river course has been diverted and narrowed. The ground fissure can be seen at the headwall of the landslide, left of center. Interstate 70 crosses the toe of the landslide. (Photo by Jon White.)

Glenwood Canyon Thanksgiving Day Rockslide

On Thanksgiving Day in 2005, a very large rockfall event occurred in Glenwood Canyon affecting a portion of Interstate 70. A segment of rock over 1,200 feet high on the canyon wall and 2,000 cubic yards in volume, detached from the cliff face, broke into many large blocks that rolled down a rockfall chute, and slammed into the highway at the valley bottom (Figure D). Thankfully, the westbound lanes were temporarily closed at the time. No vehicles were hit, but there was severe damage done to Interstate 70 highway structures, requiring the westbound lanes to be closed for almost three months for repairs.

The rockslide occurred near the Shoshone Interchange, which is a tightly constrained section of highway structures in one of the narrowest sections of the canyon. A series of bridges and retaining walls enable the highway to cross the Colorado River to the Hanging Lake Tunnel portal while still providing road and bicycle access to the Hanging Lake Rest Area. The rockfall was caught on the closed circuit video cameras used to monitor Interstate 70 traffic in the canyon. The video showed many rocks, up to 12 feet in diameter, impacting the on-ramp retaining wall of the rest area, as well as the bridges to the tunnel portal. A dust cloud generated by the rockslide filled the canyon afterwards.

When the dust cleared, the highway was littered with boulders of all sizes (See Figure E). Upon closer inspection, the true nature of the damage became apparent as large holes were punched through the concrete deck and the westbound retaining wall, demolishing a section of the bicycle path below, as well as damage to the bridge girder of the adjacent eastbound bridge (Figure F). Fortunately, no one was caught in this major rockfall event.



Figure E: Huge blocks of sandstone litter both east and westbound I-70.



Figure F: Westbound deck of I-70 with extensive damage.

Clear Creek Canyon Rockslide

A high-profile rockslide event occurred on June 21, 2005 along U.S. Highway 6 in Clear Creek Canyon, approximately 10 miles west of Golden, CO. Around 11 AM, 2,000 cubic yards of rock slid from a pre-existing road cut on the north side of the road and completely covered the road (Figure G). Two tractor-trailers were caught in the rockslide and were pushed off the road by the debris. The tractor-trailers were totaled, but only minor injuries were sustained by the drivers.

The geology at this location consists of Precambrian metamorphic schist and gneiss, which has been subsequently intruded (cut through by molten rock) by granitic pegmatite dikes. Unfortunately, one of these thin pegmatite dikes that had intruded into the metamorphic rocks was steeply inclined toward the roadway. When the dike intruded the metamorphic rocks the contact between the two rock types became “baked” and the mineralogy and texture of the rock was changed. This “baked” contact weathered to produce a zone



Figure G: Aerial view of the Clear Creek Canyon rockslide. Note how fallen rock pushed the blue and white haul truck across the roadway to hit, head on, with another haul truck (blue and red). Luckily the blue and white truck was not buried and crushed in the debris. Draped wire mesh shown hanging from the outcrop (upper left of photo) was not designed for such a massive rockslide. (Photo courtesy of the Denver Post.)

of clay-rich material. The clayey zone was structurally weak, providing a plane for the rocks above to detach from the underlying rocks and produce this large rock slide (Figure H).

To mitigate the unstable rock slope left after the slide, approximately 35,000 cubic yards of rock had to be excavated by blasting. The slope was laid back to an angle of 45 degrees, and rock reinforcement anchors were installed into the slope to enhance stability (Figure I). Wire mesh was then draped over the slope to help control any small rocks that will inevitably get loose. By the end of August 2005, after the longest full road closure in Colorado's history, the road was reopened to traffic.



Figure H: Oblique aerial photo of rockslide area after clean-up, before stabilization project. Note the overhanging, unstable rock. (Photo by CDOT.)



Figure I: Oblique aerial photo of rockslide area after rock excavation project. (Photo by CDOT.)

Foidel Creek Mine Subsidence Rockslides

A mile long stretch of rockfall-prone land in Colorado is entirely due to human activity! In the coal mining areas of Routt County in north-central Colorado, a technique called “long-wall mining” is often the most economical and preferred method for underground extraction of coal. Depending on thicknesses of the overburden (the rock and soil overlying the coal), long-wall mining and resulting collapse of the mined-out cavern can result in several feet of subsidence at the ground surface. At the Foidel Creek Mine in the mid to late 1990s, long-wall mining was extended below the surface exposure of the Twentymile Sandstone, a 100-foot thick, massively bedded, sandstone cliff that is exposed on the slope above Routt County Road 27. The strain from the ground subsidence fractured and broke almost 1½ miles of the exposed sandstone cliff, which resulted in several large rockfall events with some rock blocks the size of small homes (Figure J). The potential of rockfall was anticipated by the mine operator, the Colorado Division of Reclamation Mining and Safety, and the Colorado Geological Survey. A mile-long span of ditches and berms were constructed on the slope above Routt County Road 27 to mitigate the anticipated rockfall. Individual rock blocks in these rockfalls that rolled to the ditch have been completely contained by this mitigative design.



Figure J: Subsidence of the Foidel Creek Mine resulted in rockfall in the Twentymile Sandstone cliff face. Note rockfall ditch and berm above roadway. (Photo courtesy of Colorado Division of Reclamation, Mining, and Safety.)

Geology Then and Now

Fascinating photographic images documenting the splendor of Colorado were published by John Fielder in two books, *Colorado 1870–2000, Volumes I and II*. In these books, Mr. Fielder located and re-photographed locations and landscapes shown in historic photographs by William Henry Jackson in the 1870s. The photographs convey change over time. One can observe the growth of cities, the abandonment of work camps and mining town, the cutting and regrowth of forests, and the location of new roads and infrastructure; all put in a poignant record with the side-by-side black and white photography of

1870 and Fielder's recent color images. In one pair from Mancos Valley in Southwest Colorado, Fielder, with keen observation, comments on a new addition to a group of very large boulders. These images illustrate that in locations where very large blocks of rock litter a valley beneath steep slopes, they will in time be joined by others through continuing erosion and rockfall.

The Mancos Valley of Southwest Colorado. Top photo by William Jackson circa 1870s; bottom photo by John Fielder© 1999. Note the new rockfall block (right foreground) in the more recent picture.



Paleo-Rockfall

Rockfall has been occurring as long as Earth's crust has existed and is a normal weathering process in mountainous terrain where bedrock is exposed and the ground surface is steep. Geologists find evidence of ancient rockfall and rockslides in the landforms that are formed or sediments that are deposited. During the last ice age (about 16,000 years ago), the flanks of many mountains were steepened by the intense erosive action of hundreds of feet of glacial ice whose grinding and crushing action form the classic U-shape of many alpine valleys. As the glaciers in Colorado's alpine valleys melted, many mountain ridges were weakened by the loss of the lateral support from the glacial ice, and massive rockslides occurred. Boulder fields, rocky talus slopes, and large bulges of broken rock on valley floors remain today and serve as a geologic record of these ancient rockslide events.

One of the more interesting stories involving paleo-rockslides occurred in Glenwood Canyon in west-central Colorado. The incision rate of Glenwood Canyon in the last million years was very rapid as melt waters from several major ice age periods coursed through the canyon, carving the steep-walled gorge through heavily-fractured Precambrian basement rocks. In the last 10,000 years, rockfall from the canyon walls has filled the canyon faster than the Colorado River could remove the debris. Cottonwood Falls, also known as the "Barrel Springs" rapid, is located at the I-70 Shoshone Interchange. This is the location of a large rockslide that geologic evidence indicates fell 10,000 years ago, dammed the Colorado River, and created a lake that filled the entire east

ROCKTALK

is published by the Colorado Geological Survey
1313 Sherman Street, Room 715, Denver, CO 80203

State of Colorado, Bill Ritter, Jr. Governor

Department of Natural Resources,
Harris D. Sherman, Executive Director

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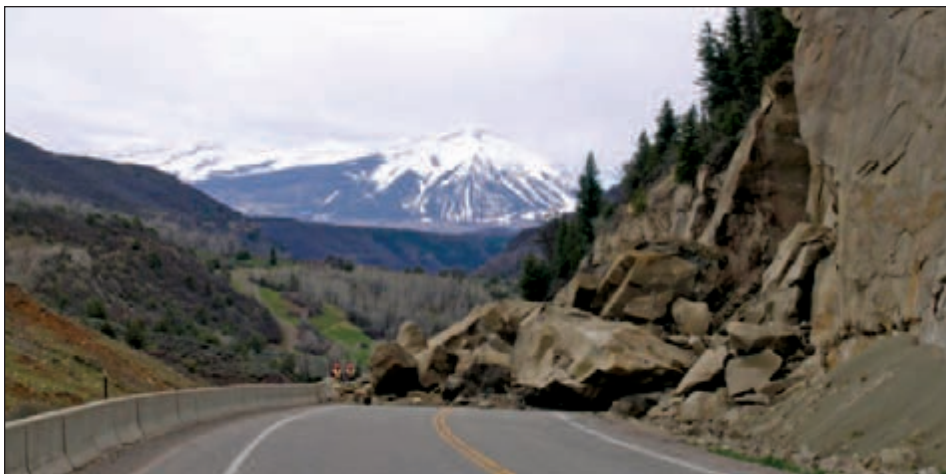
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THIS ISSUE: Editors: Jon White and TC Wait;

Production: R. Ciminelli

end of the canyon. The natural dam was never completely breached and much of it remains today. River gravel, fine-grained lake sediments with organic layers, and rockfall debris from the canyon walls simply filled in the paleo-lake to the point that the river flowed over the top of the rockslide dam, creating the river knickpoint and rapids seen today. The thick, soft, compressive lake sediments buried on the canyon floor, known locally as the "gray layer" by geologists and engineers, created significant engineering challenges for highway construction through the canyon. It was the organic material at the base of the gray layer that was dated at 9,820 (+/- 130) years before present using the carbon-14 radiometric method. Through Glenwood Canyon there are several other smaller ancient rockslides one can see on the canyon floor.





Clockwise, from upper left: Rockfall debris on Highway 133 near Paonia that occurred in the spring of 2007 (Photo by Jon White); Large boulder that fell through an apartment in Glenwood Springs in the fall of 2005 (Photo courtesy of the Glenwood Springs Post Independent); Rivers can undercut banks and create rockfall hazards; Large rockslide on Missionary Ridge near Durango that occurred in 1998 (Photo by CDOT); Boulder that fell on a county road in Jefferson County in the spring of 2007 (Photo by Inter-Canyon Fire Department).



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BrieAnna Grandy

From: Troy Parmley [REDACTED]
Sent: Wednesday, September 24, 2025 8:03 PM
To: BrieAnna Grandy
Subject: Bella Mesa North proposal
Attachments: IMG_0026.jpeg

Follow Up Flag: Follow up
Flag Status: Flagged

Castle Rock Planning Commission and Town Council;

I am a 20+ year resident of Castlewood North in Franktown, directly below the ridge of the proposed Bella Mesa North. I am writing concerned with several aspects of this potential development. As I view this proposal, I question if the developer is aware of the **Douglas County Comprehensive Master Plan**(DC CMP)with the hope that the decision makers of Castle Rock abide by the policies of the Master Plan.

Policy 2-2A.1

New development located in proximity to moderate to high value wildlife habitat should include a study and inventory of habitats, movement corridors, and habitat linkages.

In an email from John V Hill dated 22 September 2025, he stated that “there was a very complete wildlife inventory made last year and the development concepts and planning take the finding into account. The research was done by the environmental firm Birch Ecology, which worked closely with Redlands and Cardel in developing the final master plan”

I spoke with Heather Houston 24 September 2025 who stated that she is an ecologist and was only used to do an ecological inventory and suggest a route for the nature trail. The truth of the matter is no wildlife study has been performed and I have walked this site for decades and have seen Bald Eagles, Great Horned Owls, Bobcats, and Mule Deer.

Policy 2-5A.4

Use creative design and planning approaches to mitigate environmental and visual impacts on the natural terrain, such as bluff lines, open spaces, hog backs, major drainage ways, or other adjacent topographical features.

In the concept site plan of Bella Mesa North, homes will be developed within 600’ of the ridge line, creating “visual impacts on the bluff line”. The ridge line to the west of Franktown that flows into Castlewood State Park define Franktown and should be protected. In the development of Castlewood Ranch, constituents were told there would be considerable setback and this did not happen scarring the ridge permanently.

Policy 2-6B.2

Blend the existing character of adjoining developments with the design of new developments.

The Bella Mesa North proposal consists of high density homes adjoining Castlewood North comprised of 10 and 20 acre lots. To comply with this policy homes should ,at minimum 2 to 5 acres. Cardel homes enlarged lot sizes that merge with Castlewood Ranch so the question is why isn't this transition also applied to Castlewood North.

Policy 4-1A.1

Establish a clearly defined **regional edge and community separation buffer**, in concert with Objective 3-1D of this plan.

-Objective 3-1D

Establish community separators to maintain community identity and sense of place.

Bella Mesa North lots to homes in Castlewood North are only separated 1800' and if accounted for land owned up the ridge 600', which doesn't allow for a "separation buffer" or "community separators".

Policy 4-1A.2

Maintain a distinct Franktown-area identity **outlined by natural boundaries of open space and development-free ridgelines**".

Again, the ridgeline west of Franktown, identifies Franktown and should be protected at all costs.

Policy 4-1B.2

Protect from development, in perpetuity where possible, open space areas critical to wildlife and other biotic systems, or that **contain important highway views toward ridgelines to the west of Franktown**, as well as the views of Cherry Creek.

There is a common theme when it comes to the policies of the DC CMP and the protection of Franktown history. Again the ridge west of Franktown, identifies Franktown and should be preserved as it identifies Franktown(Douglas Counties original county seat)as well as contains the "Franktown cave".

Cardel has identified that there will be two story homes that will be built on the eastern flank of Bella Mesa North which will further encroach on the view of the Franktown ridge line. Cardel reported that their protection of the view of the Franktown ridge line was from the closest house below the ridge.

More issues that are in need of addressing are;

- The proposed site largely consists of cap rock and with the need for infrastructure there will be a very large amount of digging, excavating and drilling to accomplish this difficult task.

- > Cardel has verified that they will be utilizing blasting to open up the cap rock for infrastructure as well as foundations. The build out for this project is estimated between 5 to 7 years. That is 5 to 7 years of hearing, living, and dealing with the loud sounds of blasting, digging and jack hammering. This does not even account for the dangers of potential boulder falls into our homes.

- > A large swath of the ridgeline has multi- ton rock formations that are already cracked away from the ridge and with all the digging to be accomplished what safety measures would be in place to protect homes that sit less than 500' from the ridge. Attached is a picture of a part of the rock that at some point separated from the ridge.

> The residents of Castlewood North live in a natural amphitheater and can hear an individuals talking from atop the ridge. During this process that could take 5 to 7 years to complete, how would the builder prevent the residents from this cascade of construction noise.

- Traffic study

> There are only 2 ingress/egress and the primary use will be N Mitchell St which connects to Enderud Blvd via Mikelson Blvd. The intersection of Enderud Blvd and Hwy 86 are in their current state, highly congested and this proposal puts a potential of another 1000 vehicles into this.

I would like to make light that Douglas County accomplished a survey in 2024 and results of that survey showed that the residents of Douglas County;

- The single highest priority of citizens is open space, a conclusion borne out of multiple questions and a sentiment shared broadly across most all segments of the population.

- Preferred option

> Preserving more open space

- Future spending to

>Conserve lands along streams and lakes that also protect water quality

>Preserve scenic views and landscapes

In conclusion, as previously mentioned, Castlewood Ranch was approved where houses were built in close proximity to the Franktown ridge and now this can never be reversed. I want to ensure that the best decisions are made for the residents of Castle Rock and Franktown.

Thank you

Troy Parmley

[REDACTED]

[REDACTED]



BrieAnna Grandy

From: Terra Toone [REDACTED]
Sent: Saturday, September 27, 2025 1:29 PM
To: BrieAnna Grandy
Subject: Bella Mesa-CardelHomes

Follow Up Flag: Follow up
Flag Status: Flagged

Hello BrieAnna,

I apologize for the late email, I was focused on getting my daughter married off! I just wanted to see how it went at the hearing and express my concerns.

1. With it being located where it is proposed, how will traffic work as it will intensely be affected if that many home would be going up, that is A LOT of homes to add to to only two ways in and out.
 2. How is sewage, drainage and water going to be affected?
 3. With 525 homes being proposed, where will the kids and teens go to school as we are already accommodating elementary age kids from Crystal Valley.
 4. HOA, what will the impact being for taxes and HOA?
 5. How will the new community effect out home values, I can't imagine it would benefit out economy where it is being proposed. I live on the ridge side in the million dollar homes.
 6. The demand of energy in our area, how is that proposed to keep up with that demand.
 7. How is Castle Rock going to be keeping up with the needs with this growth, I would assume with 525 houses that means an additional 1,200 cars or so, an additional 2k plus people an this is in addition to the growth appending all over.
- Anyway, again I apologize for the late email I jsut did want to participate in the proposed site and express my concerns.
Thank you-
Terra

BrieAnna Grandy

From: Tara Vargish
Sent: Thursday, October 2, 2025 6:57 AM
To: BrieAnna Grandy
Subject: Fwd: Bella Mesa project
Attachments: letter to Castle Rock.docx

Begin forwarded message:

From: Dave Corliss <DCorliss@crgov.com>
Date: October 1, 2025 at 9:24:42 PM MDT
To: Shannon Eklund <SEklund@crgov.com>, Tara Vargish <TVargish@crgov.com>, TJ Kucewesky <TKucewesky@crgov.com>
Subject: Fwd: Bella Mesa project

Add this email to this agenda item - thanks !
Sent from my iPhone

Begin forwarded message:

From: Nancy Mitchell [REDACTED]
Date: October 1, 2025 at 8:30:02 PM MDT
To: TownCouncil Mailbox <towncouncil@crgov.com>
Subject: Bella Mesa project

Dear Council members, Mayor Gray, and Mayor Pro Tem,

My name is Nancy Mitchell. I am a Douglas County Resident of more than 40 years. I attended your planning commission meeting last week, and was disappointed that in a 5 /2 vote, your planning commission chose to present as approved the Bella Mesa development project. This project will have a profound impact on your Douglas County neighbors in Castlewood North, whose properties you have annexed land abutting. The planning commission indicated that the applicant had met all the city's requirements, admitting that they had not yet seen a finished study regarding the rockfall risks and blasting to be done on the granite cap above us, nor had their wildlife study addressed the rattlesnake population in the canyon that will be disturbed by the vibrations of the development infrastructure. These snakes will, as before, descend on us. Please read the attached letter which addresses these issues and the traffic pattern disturbance to State Hwy 86, as 1000 more vehicles enter and exit.

Thank you for entertaining our concerns.

[REDACTED]

[REDACTED]

Town Council Et al
Town of Castle Rock
100 Wilcox St
Castle Rock, CO

Dear Council members,

My name is Nancy Mitchell. I live at [REDACTED] in unincorporated Douglas County. You, as the town, have annexed County land to extend your growth to my back pasture and property line, on the wall of Castlewood Canyon. My neighbors and I have been a part to, and concerned with, the development of both Castlewood Ranch and now Bella Mesa, as they affect our properties in Castlewood North. After recently attending public meetings to include your planning commission meeting, it became clear that no concerns outside the city limits would be entertained by the Castle Rock Planning Commission. The commission passed by 5 60 2 a recommendation to approve this development as offered by this developer, even when advised that neither a study regarding the rockfall assessment and blasting of the granite ridgecap had been completed, nor had the wildlife study included the rattlesnake population which will certainly be unleashed on the surrounding properties when the blasting vibrations occur.

If approving the above, this letter will be your notice, as the Town Council, with our intent to hold the town liable for any and all property damage caused by inadequate assessment of risk, both of falling rock, vibration destruction, and drainage rerouting whether inadvertent or not, and to continue to be held responsible for liability for persons falling from the edge or climbing down the side of the canyon, and entering our properties for any reason, injuries notwithstanding. This includes items thrown from the cliff edge and arson of the canyon wall. To proceed to allow this application without full understanding of the risk to the properties already established below the rim of the canyon, and with no plan to shield these properties from harm or privacy invasion, should be considered worthy of, and awarded compensatory damages from the town.

Very truly yours,

Nancy Mitchell

BrieAnna Grandy

From: Wheeler, Marc [REDACTED]
Sent: Saturday, October 4, 2025 1:15 PM
To: BrieAnna Grandy
Subject: Bella Mesa north

I will be unable to attend the meeting at 6 o'clock on Tuesday, October 7 as my son has a choir concert at Sage Canyon elementary school. We live at [REDACTED] and have lived here since 2011. We have enjoyed the natural Colorado landscape behind us for these many years. The Bella Mesa North community will deteriorate our wild Colorado landscape views, but more importantly, my wife and I have concerns about the school district's current abilities to service this many new homes. In addition, my understanding is there's a real concern with water consumption at our current population. In addition, having already sent three of my five children to Mesa middle school the morning drop off and afternoon pick up traffic is already quite a nightmare at times. I can't imagine adding an entire neighborhood trying to leave for work, while others are trying to drop off children. I have hiked the trails that currently run through this area and it really does feel like a tragedy to put homes in such a beautiful spot. Our city does such a great job with its parks and open spaces. I can imagine the Bella Mesa open space or recreational area would be another gem to our amazing community. Please DO NOT authorize additional homes to be built in this special place.

[Marc Wheeler](#)

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

BrieAnna Grandy

From: Tara Vargish
Sent: Monday, October 6, 2025 12:43 PM
To: [REDACTED]
Cc: BrieAnna Grandy
Subject: Bella Mesa North public parking and southern buffer edge
Attachments: Bella Mesa Overall - Public parking lot circled.pdf; Bella Mesa Buffer Landscaping.pdf

Mr. Hodits,

It was a pleasure to meet you at Councilmember Brooks' open house last week. I am emailing to follow up on the questions you had regarding the Bella Mesa North site development plan – specifically related to questions on public parking in the new neighborhood and fencing or landscaping on the southern edge.

The Bella Mesa North layout includes a public/park/trail head parking lot internal to the development. It had originally been closer to the southern boundary, however past resident feedback asked it to be pushed further north from Sheldon. It is circled in red in the attachment. Additionally, all of the local residential streets with houses fronting to the allow public parking. You can see numerous trail head connections around the edges of the development that allow public on street parking next to them.

For the private lots on Sheldon – specifically the private driveway closest to Mitchell Street that you had asked about, there is landscaping proposed in clustered locations to provide a visual and physical deterrent for the public to wander up a private drive and onto the new trail. The Landscape sheet shows a closeup of this area, with new landscaping shown. I put a red arrow generally indicating the view up the private drive that you mentioned.

We will relay to the applicant that there was a request for fencing, and ask that they highlight this boundary and the landscaping they are proposing in their presentation on Tuesday night. Thank you again for attending the open house and for sharing your questions and suggestions on this project.

Thank you,

Tara Vargish, PE, Director Development Services
Town of Castle Rock, Town Hall, 100 N. Wilcox St, Castle Rock, CO 80104
direct 720.733.3582 mobile 720-473-2473 tvargish@CRgov.com

Your feedback is important to us, please let us know how we are doing by taking our Customer Service survey:
<https://www.surveymonkey.com/r/LR35C27>

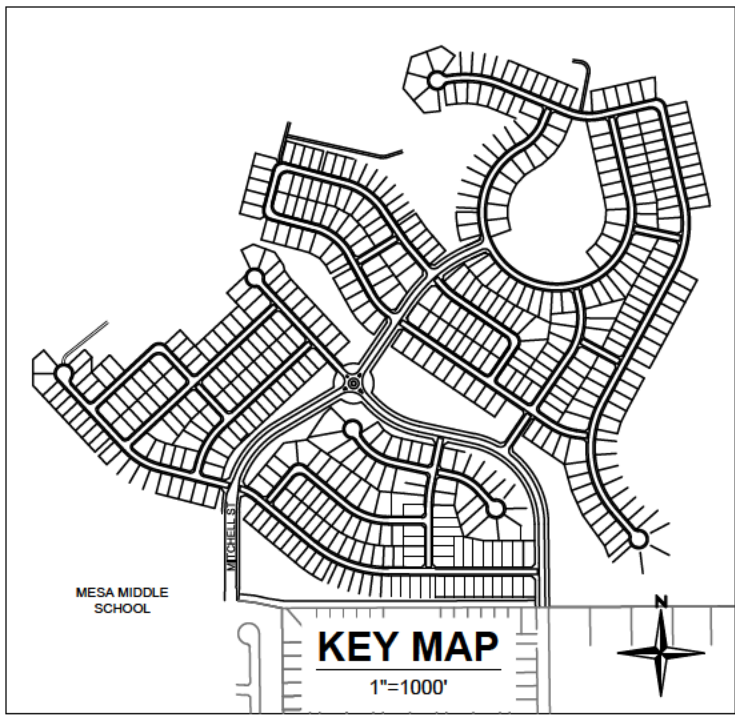
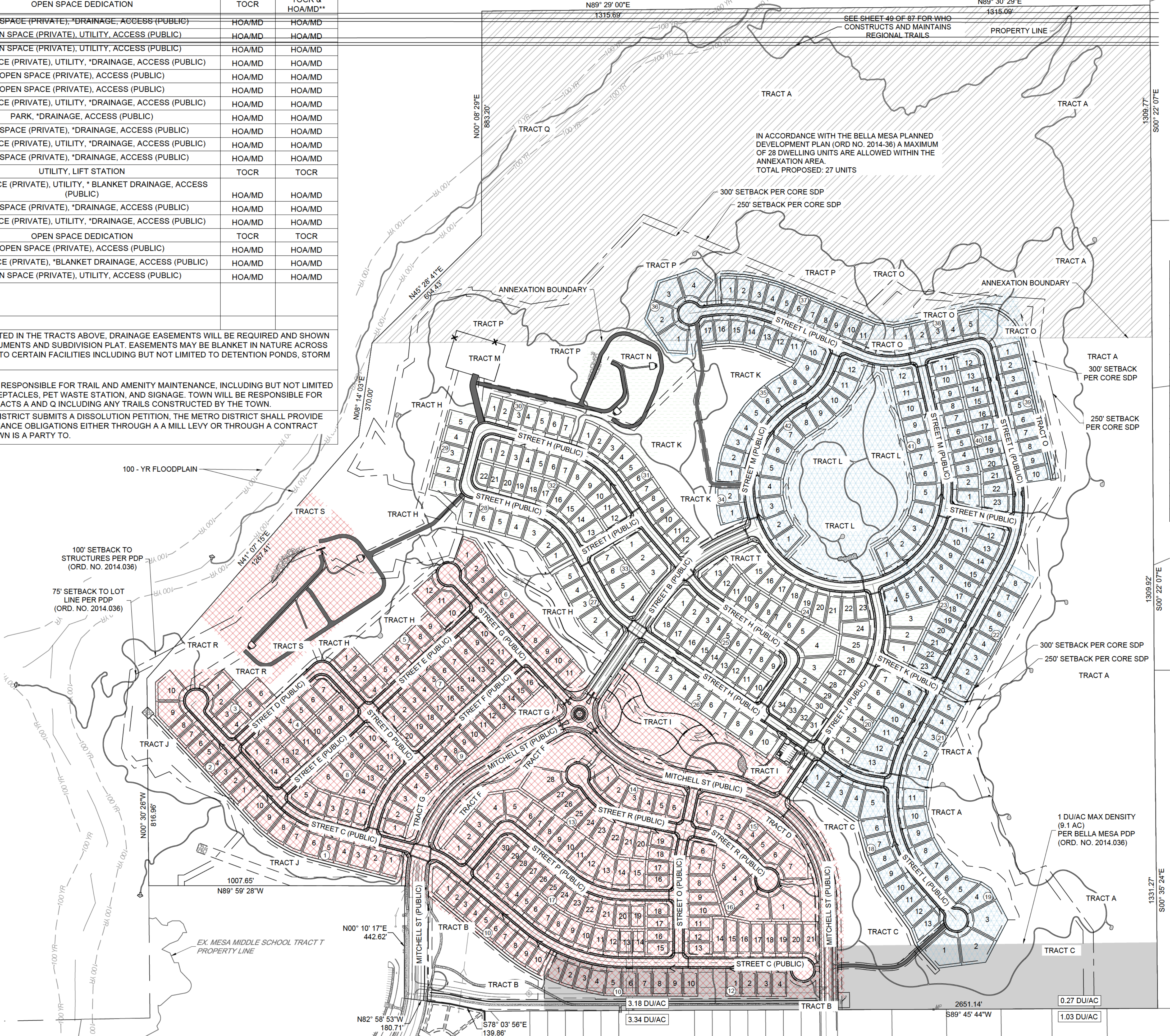
SITE DEVELOPMENT PLAN
BELLA MESA NORTH

LOCATED IN THE PORTIONS OF THE SOUTHWEST QUARTER SECTION 4, THE SOUTHEAST QUARTER OF SECTION 5, THE NORTH HALF OF THE NORTHEAST QUARTER OF SECTION 8, AND THE NORTH HALF OF THE NORTHWEST QUARTER OF SECTION 9, TOWNSHIP 8 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN AND A PORTION OF THE EAST HALF OF SECTION 6, TOWNSHIP 8 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN, TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS, STATE OF COLORADO.
TOWN OF CASTLE ROCK PROJECT NUMBER SDP24-0040

TRACT SUMMARY				
TRACT	ACREAGE	DESCRIPTION	OWNERSHIP	MAINTENANCE
A	86.09	OPEN SPACE DEDICATION	TOCR	TOCR & HOA/MD**
B	5.28	OPEN SPACE (PRIVATE), *DRAINAGE, ACCESS (PUBLIC)	HOA/MD	HOA/MD
C	11.21	OPEN SPACE (PRIVATE), UTILITY, ACCESS (PUBLIC)	HOA/MD	HOA/MD
D	0.93	OPEN SPACE (PRIVATE), UTILITY, ACCESS (PUBLIC)	HOA/MD	HOA/MD
E	0.43	OPEN SPACE (PRIVATE), UTILITY, *DRAINAGE, ACCESS (PUBLIC)	HOA/MD	HOA/MD
F	1.23	OPEN SPACE (PRIVATE), ACCESS (PUBLIC)	HOA/MD	HOA/MD
G	1.14	OPEN SPACE (PRIVATE), ACCESS (PUBLIC)	HOA/MD	HOA/MD
H	13.06	OPEN SPACE (PRIVATE), UTILITY, *DRAINAGE, ACCESS (PUBLIC)	HOA/MD	HOA/MD
I	3.99	PARK, *DRAINAGE, ACCESS (PUBLIC)	HOA/MD	HOA/MD
J	6.28	OPEN SPACE (PRIVATE), *DRAINAGE, ACCESS (PUBLIC)	HOA/MD	HOA/MD
K	4.93	OPEN SPACE (PRIVATE), UTILITY, *DRAINAGE, ACCESS (PUBLIC)	HOA/MD	HOA/MD
L	6.70	OPEN SPACE (PRIVATE), *DRAINAGE, ACCESS (PUBLIC)	HOA/MD	HOA/MD
M	0.69	UTILITY, LIFT STATION	TOCR	TOCR
N	4.79	OPEN SPACE (PRIVATE), UTILITY, * BLANKET DRAINAGE, ACCESS (PUBLIC)	HOA/MD	HOA/MD
O	3.20	OPEN SPACE (PRIVATE), *DRAINAGE, ACCESS (PUBLIC)	HOA/MD	HOA/MD
P	10.79	OPEN SPACE (PRIVATE), UTILITY, *DRAINAGE, ACCESS (PUBLIC)	HOA/MD	HOA/MD
Q	10.10	OPEN SPACE DEDICATION	TOCR	TOCR
R	1.25	OPEN SPACE (PRIVATE), ACCESS (PUBLIC)	HOA/MD	HOA/MD
S	6.62	OPEN SPACE (PRIVATE), *BLANKET DRAINAGE, ACCESS (PUBLIC)	HOA/MD	HOA/MD
T	0.14	OPEN SPACE (PRIVATE), UTILITY, ACCESS (PUBLIC)	HOA/MD	HOA/MD
TOTAL ACER AGE	178.86			

*WHERE DRAINAGE USES ARE NOTED IN THE TRACTS ABOVE, DRAINAGE EASEMENTS WILL BE REQUIRED AND SHOWN ON FUTURE CONSTRUCTION DOCUMENTS AND SUBDIVISION PLAT. EASEMENTS MAY BE BLANKET IN NATURE ACROSS THE ENTIRE TRACT, OR SPECIFIC TO CERTAIN FACILITIES INCLUDING BUT NOT LIMITED TO DETENTION PONDS, STORM SEWER OR DRAINAGE SWALES.

**HOA/METRO DISTRICT SHALL BE RESPONSIBLE FOR TRAIL AND AMENITY MAINTENANCE, INCLUDING BUT NOT LIMITED TO TRAILS BENCHES, TRASH RECEPTACLES, PET WASTE STATION, AND SIGNAGE. TOWN WILL BE RESPONSIBLE FOR MAINTENANCE IN THE REST OF TRACTS A AND Q INCLUDING ANY TRAILS CONSTRUCTED BY THE TOWN.
IN THE EVENT THAT THE METRO DISTRICT SUBMITS A DISSOLUTION PETITION, THE METRO DISTRICT SHALL PROVIDE AN ASSUMPTION OF THE MAINTENANCE OBLIGATIONS EITHER THROUGH A MILL LEVY OR THROUGH A CONTRACT WITH THE HOA TO WHICH THE TOWN IS A PARTY TO.

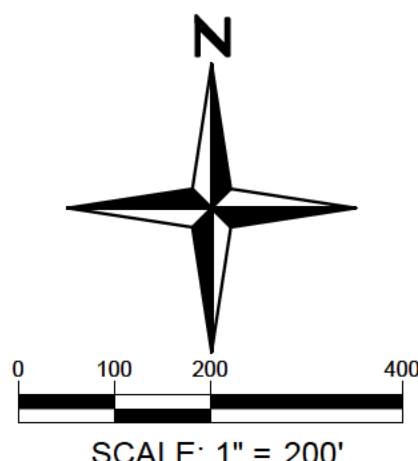


	PHASE 1: 230 LOTS		ADJACENT DENSITY CALCULATION AREA
	PHASE 2: 137 LOTS		ANNEXATION AREA
	PHASE 3: 158 LOTS		

PHASE 1		PHASE 2		PHASE 3	
BLOCK NUMBER	NUMBER OF LOTS	BLOCK NUMBER	NUMBER OF LOTS	BLOCK NUMBER	NUMBER OF LOTS
1	10	20	7	18	13
2	10	23	3	19	11
3	6	24	34	20	6
4	14	25	18	21	5
5	12	26	10	22	8
6	11	27	5	23	20
7	20	28	7	35	17
8	14	29	5	36	4
9	16	30	7	37	11
10	10	31	12	38	5
11	10	32	22	39	10
12	4	33	7	40	23
13	29			41	12
14	6			42	13
15	7				
16	21				
17	30				

STREET NAMES		
PHASE 1	PHASE 2	PHASE 3
-STREET C	-STREET B	-STREET H*
-STREET D	-STREET H*	-STREET K*
-STREET E	-STREET I	-STREET L
-STREET F	-STREET J	-STREET M*
-STREET G	-STREET K*	-STREET N
-STREET O	-STREET M*	
-STREET P		
-STREET R		
-MITCHELL ST		

*SEE TRACT SUMMARY TABLE ON LEFT SIDE OF SHEET FOR MORE INFORMATION.



WHERE GREAT PLACES BEGIN

720.283.6783
REDLAND.COM

• Land Planning
• Civil Engineering
• Landscape Architecture
• Construction Management

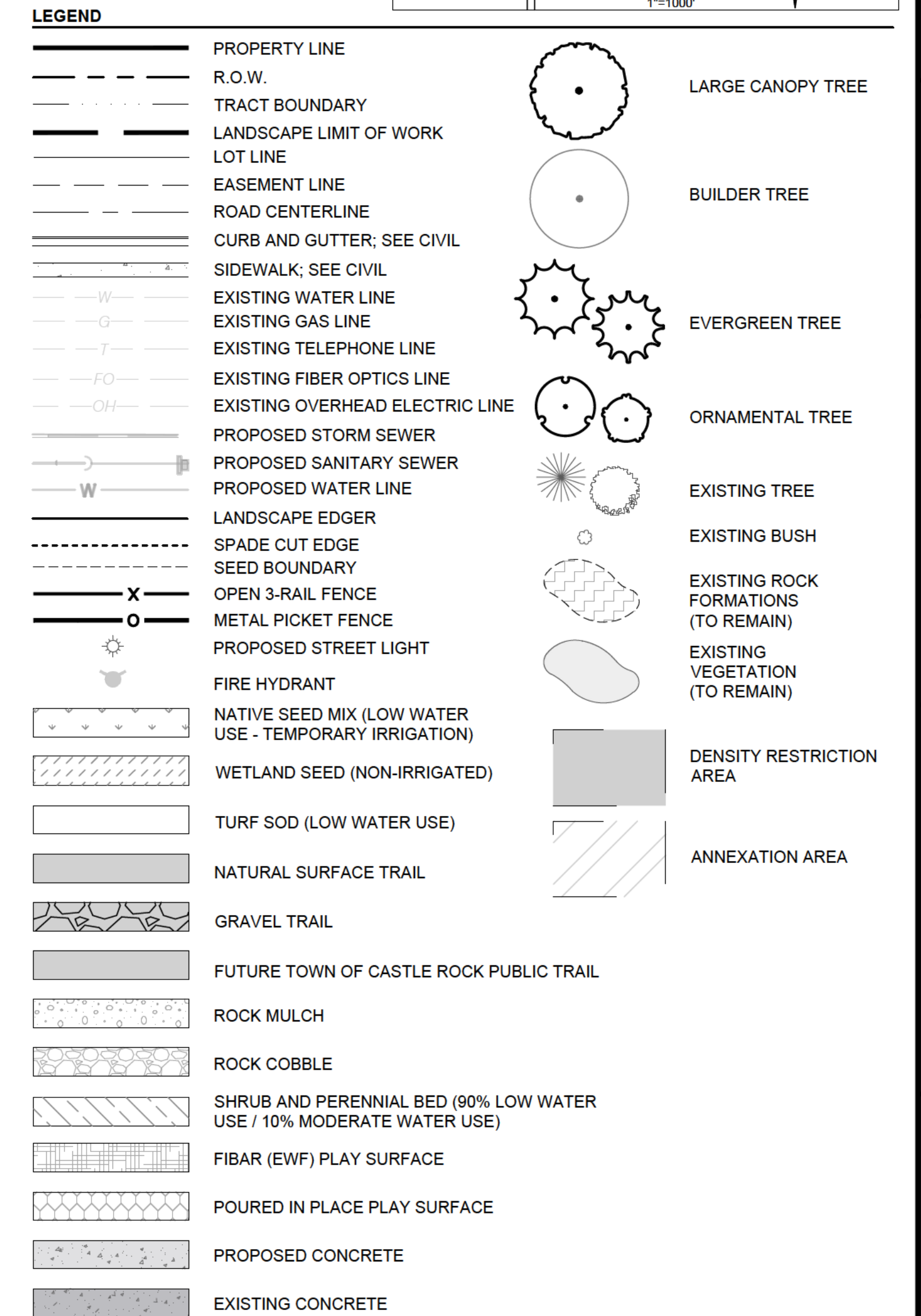
NOT FOR CONSTRUCTION

PROJECT NO.	17026.004
DATE	12/05/2024
NO.	1
NOTES	FIRST SUBMITTAL TO TOWN
DATE	04/04/2025
NO.	2
NOTES	SECOND SUBMITTAL TO TOWN
DATE	08/27/2025
NO.	3
NOTES	THIRD SUBMITTAL TO TOWN
DATE	08/08/2025
NO.	4
NOTES	FOURTH SUBMITTAL TO TOWN
DATE	08/28/2025
NO.	5
NOTES	FIFTH SUBMITTAL TO TOWN

BELLA MESA NORTH
SITE DEVELOPMENT PLAN
PHASING PLAN

SHEET
3 OF 87

LOCATED IN THE PORTIONS OF THE SOUTHWEST QUARTER SECTION 4, THE SOUTHEAST QUARTER OF SECTION 5, THE NORTH HALF OF THE NORTHEAST QUARTER OF SECTION 8, AND THE NORTH HALF OF THE NORTHWEST QUARTER OF SECTION 9, TOWNSHIP 8 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN AND A PORTION OF THE EAST HALF OF SECTION 6, TOWNSHIP 8 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN, TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS, STATE OF COLORADO.



MATERIALS LEGEND		DETAIL/SHEET
PAVING, RAMPS, AND CURBS		
1.1	CONCRETE	SEE CIVIL
1.2	GRAVEL TRAIL	6/86 OF 87
1.3	NATURAL SURFACE TRAIL	9/86 OF 87
SITE FURNITURE		
2.1	BENCH	1/86 OF 87
2.2	PICNIC TABLE	2/86 OF 87
2.3	BIKE RACK	5/86 OF 87
2.4	TRASH RECEPTACLE	3/86 OF 87
2.5	PET STATION	4/86 OF 87
2.6	LOG BENCH	5/87 OF 87
RAILING, BARRIERS, AND FENCING		
3.1	3-RAIL FENCE	7/86 OF 87
3.2	METAL PICKET FENCE	5/87 OF 87
PLANTING AND LANDSCAPE		
5.1	STEEL EDGER	6/85 OF 87
5.2	CONCRETE EDGER	5/85 OF 87
5.3	BOULDERS	7/85 OF 87
5.4	DRY CREEK BED	8/86 OF 87
MISCELLANEOUS SITE FEATURES		
6.1	BARBEQUE GRILL	10/86 OF 87
6.4	SHADE SAIL STRUCTURE	11/86 OF 87
SIGNAGE AND MONUMENTS		
7.1	PARK MONUMENT SIGN	1/87 OF 87
7.2	TRAIL WAYFINDING SIGN	2/87 OF 87
7.3	TRAIL MILE MARKERS	3/87 OF 87
7.4	INTERPRETIVE SIGN	4/87 OF 87
7.5	CASTLEWOOD RANCH MONUMENT	5/87 OF 87

SUNSET POINT
SITE DEVELOPMENT PLAN
PROJECT NO. SDP24-0040

BrieAnna Grandy

From: Caroline Benzley [REDACTED]
Sent: Saturday, October 4, 2025 1:57 PM
To: BrieAnna Grandy
Subject: Bella Mesa North Proposal

Hello BreiAnna,

My husband and I moved to Castlewood Ranch 15 years ago. Everyday we feel grateful for the beautiful place that we can live and raise our children in. We also own a Castle Rock business and work hard to serve the community in healthcare everyday.

I have heard about the proposed Bella Mesa North Subdivision and I am extremely opposed to it.

That little piece of land is a haven for me and our family. We hike the trails often (almost weekly), and feel grateful for the sunset, sunrise, and middle of the day views over into the Franktown area that give us refreshment and perspective in an otherwise very chaotic and busy world. Our 12-year-old daughter is a bird watch and she has learned and followed amazing bird species in that area as well. Without a doubt, she and all of our children have become more confident and grounded through the time that she has spent in nature in that area. Our children do well in school and feel better about life and themselves when they can get off their devices and get time in nature, and for us that is our go-to place to get that time. The area that could have homes on it currently brings us and many other people peace.

Additionally, we have also sent 4 children to Mesa Middle School so far and a part of my every day is driving past the very spot where this subdivision is proposed to be built. Coming from someone who has to try to merge into the Mesa traffic every morning, I would say that there is definitely no room for any more houses and cars. I have to turn from Mitchell onto N. Mitchell Street and as it is, it can take over a minute or so for someone to have the kindness to allow me to turn right into the flow of traffic at the drop off line on N. Mitchell. Additionally, if a car in front of me is trying to turn left onto N. Mitchell to exit the neighborhood (which often happens since this is prime commuting time in the morning), it will take much longer for people going both ways to let them in - several minutes at least and there will be several cars lined up behind them as they wait. With the proposed subdivision there will be additional cars trying to turn into the Mesa drop-off line, or trying to turn out of the neighborhood. Not only is this an inconvenience, but I believe it is a true safety hazard. There are many children that have to cross N. Mitchell street on their way to walking to Mesa Middle School. More cars will just add to the risk that already exists of a car not seeing them, especially in the sometimes glaring morning sun. I believe that additional cars in this area would be a constant source of stress, not only for me, but also for our young middle schoolers who are trying to get to school on time and safely.

Once again, I am strongly opposed to this development.
Thank you for your consideration.

Sincerely,
-Caroline Benzley

Good morning Caroline,

Thank you for providing your feedback and comments related to the Bella Mesa North site development plan. Your information has been compiled and will be provided in the public hearing packets for Town Council, who makes the final decision on this application. We appreciate your comments and concerns on this development. Please feel free to send me any additional questions or concerns.

Thank you.



BrieAnna Grandy

Development Services | Senior Planner

Town Hall, 100 N. Wilcox St, Castle Rock, CO 80104
Direct 720.733.3566 | bgrandy@crgov.com

Your feedback is important to us, please let us know how we are doing by taking our Customer Service survey: <https://www.surveymonkey.com/r/LR35C27>

From: Caroline Benzley [REDACTED]
Sent: Saturday, October 4, 2025 1:57 PM
To: BrieAnna Grandy <BGrandy@crgov.com>
Subject: Bella Mesa North Proposal

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Once again, I am strongly opposed to this development.

Thank you for your consideration.

Sincerely,

-Caroline Benzley

BrieAnna Grandy

From: Jerry Clark [REDACTED]
Sent: Tuesday, October 7, 2025 3:07 PM
To: BrieAnna Grandy
Cc: Denver.land@cardelhomes.com
Subject: Proposed Development of Bella Mesa North

Follow Up Flag: Follow up
Flag Status: Flagged

BrieAnna, et al

As a homeowner located within 1.5 miles of the proposed development site I vehemently object to the proposal by Cardel homes to construct 525 homes in the open space north of Mesa Middle School. I've lived here for 17 years. I've watched the "town" of Castle Rock grow. Undergo development. I'm 76 years old. Seen many beautiful open areas turned into homes and parking lots. The developers move on once finished. Those of us whose quality of life is diminished due to all that follows from their "investments" are not considered all too often. I understand supply and demand economics. Is that what is truly playing out here with this proposed development?

If approved, this addition of 525 homes would see our property values devalued. Increased traffic, crime, and all that goes with such a massive proposed development to the long established surrounding residential community. Maybe a 100 home proposal to start would be palatable. Certainly not 525. How many years would we be looking at, and dealing with, all of the ugliness associated with that construction? Is this a necessary development? I'm saying no. Absolutely NOT.

It will be a horrible shame if the proposed development is allowed to be initiated. I am only one with this opinion. I'm certain there are others. My fear is that our voices will be disregarded and big money will trample us.

Jerry and Ginny Clark
Founders Area, Castle Rock

BrieAnna Grandy

From: Dale Eben [REDACTED]
Sent: Tuesday, October 7, 2025 4:01 PM
To: BrieAnna Grandy
Subject: Public Hearings- Bella Mesa North

Dear Members of the Town Council,

We are residents of the Founders neighborhood writing to formally express our objection to the proposed expansion project at Bella Mesa North.

Our concerns center on the negative impact this development will have on our community. Specifically, we believe the additional housing will significantly increase traffic congestion in and out of the greater Founders area, straining existing road infrastructure. Additionally, the project raises serious concerns about overuse of local water resources, which are already under pressure.

The open space near the school currently provides scenic views, walking trails, and a vital habitat for local wildlife. The loss of this natural area would be a permanent and regrettable change to the character and livability of our neighborhood.

We appreciate your time and consideration of our concerns, and we respectfully urge you to reconsider or revise the proposed expansion plan.

Sincerely,
Amy and Dale Eben
[REDACTED]

BrieAnna Grandy

From: Nathan Beechley [REDACTED]
Sent: Tuesday, October 7, 2025 4:49 PM
To: BrieAnna Grandy
Subject: Late message

Sorry for late message.

I am adamantly against the proposed Bella Mesa North subdivision.

I think this is a terrible idea and a terrible use of such a beautiful piece of land. Dropping off and picking kids off at Mesa middle school is already horrible and I can imagine the already congested traffic would be increased exponentially by another 525 single-family homes.

Brianna I think this development should not move forward. It would ruin such a beautiful area which was the main reason for our move to Founders in 2022. If you've never hiked the trails over there or gone on a run or walk in that area, please take a chance and I promise you'll agree with me.

Thank you for listening and understanding my adamant opposition to this development.

Sincerely yours,

Nathan L Beechley

[REDACTED]

Bella Mesa North Development Concerns

While the proposed plan has been approved by the planning commission concerns remain.

Water Drainage onto Ardmore and Peabody Properties

On Ardmore and Peabody streets along Mitchell street during heavy rains water drainage has extended approximately 20 feet onto Castlewood Ranch property.

There are currently drainage ditches on both sides of Mitchell street in this area. However, this section of Mitchell street will be removed.

Existing drainage concerns were brought to the attention of the city planner and the developer. The developer verbally assured us that no water from Bella Mesa would drain onto Castlewood Ranch property.

Will the city review and assure that there are no future drainage problems for existing home owners from the development, and the removal of this section of Mitchell street?

Blasting

The homes on Ardmore and Peabody street are the closest homes to the set-backs for Bella Mesa North. Existing homes don't have basements, because of rock. The developer stated that the "experts" said that blasting within 100 feet of existing homes "should be safe".

Would the city require the developer to have a further set-back to homes along Ardmore and Peabody streets or not allow blasting for the adjoining proposed homes new homes.

In the event that blasting so near our homes should result in damage, will the city, developer, and "experts" be responsible for any damages, including repairs and loss in home value?

Traffic

With an elementary school and a middle school in Castlewood Ranch, currently, Mitchell street becomes a "parking lot" at least twice a day during school sessions.

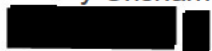
Existing traffic problem: We were told that traffic studies "meet the criteria" for an additional 525 homes. How can this criteria be sufficient when there is an existing traffic problem?

Emergency or evacuation: There is a substantial safety problem for both school children and existing residents should there be an emergency or a needed evacuation.

Would the city and developer adequately address these factual traffic problems?

Thank you,

Nancy Grisham



Castle Rock, CO 80104