April 29, 2026

Bull Domingo Ranch Property Owners Association
Attention: Karen Genneken, President
PO Box 248
Westcliffe, CO 81252

RE: Review of Bull Domingo Ranch Traffic Calming Implementation Plan

Purpose

McDowell Engineering has reviewed the draft Bull Domingo Ranch Property Owner Association's ("POA") *Bull Domingo Ranch* (*BDR) Traffic Calming Implementation Plan* ("*Plan*") and prepared the comments below. This memorandum evaluates the feasibility of the POA's proposed traffic calming measures and presents additional alternatives for BDR's consideration. The objective of these installations is to address concerns related to vehicle speeding. It is essential to adopt a safe and consistent strategy across the entire BDR roadway network.

Summary

Overall, the draft plan reflects a thoughtful, well-documented decision-making process and is broadly aligned with the goals articulated by the POA. This includes the identification of several relevant discussion items, including:

- Reducing speeding and the perception that BDR is an easy place to speed,
- Reducing incident risk, and
- Managing liability exposure.

The thorough investigation by the POA into solutions for the community demonstrates the Board's due diligence and commitment of transparency and accountability to its constituents.

Key Guidelines for Speed Dip Installation

To ensure the effectiveness and safety of speed dip installations throughout BDR, the following guidelines should be observed:

- Speed dips should not be placed on curves.
- Speed dips should not be located at the bottom of hills.
- Speed dips should not be installed at the top of hills.
- Adequate sight distances must be maintained based on the posted speed limit.
- Appropriate warning signage should be installed in advance of every speed dip.
- Other considerations should be considered to further ensure the safe and consistent application of speed dips across the community's roadway network.

Traffic Calming Implementation Strategy

Bull Domingo Ranch Transportation Infrastructure

Per the BOA's website, BDR has over 50 miles of dirt roads. Maintaining them is their largest expense. Washboarding and dust is a constant battle. Compliance with the 30 mph speed limit will help washboarding and extend the life of the gravel surface.

BDR is bordered by Copper Gulch Road, Oak Creek Grade, and Highway 69. These are public roadways owned and maintained by Custer County and CDOT. The Wet Mountains border the east and northeast portion of the site. There are multiple private accesses to the community. Some are gated and others do not have gates. The roads within BDR are private. The posted speed limit is 30mph throughout the community.

A majority of the traffic is from residents and ancillary services for the residents of BDR. However, non-resident public access is often seen on the roadway network, particularly in the southern portion of the site.

BDR will purchase a radar speed and data acquisition sign in early 2026 to collect baseline speed data before installing traffic calming measures. This will help assess the effectiveness of speed reduction efforts.

Reducing speeding directly addresses a key safety issue for the community. Feedback, including survey responses and a recent incident where a property owner's dog was killed by a speeding driver, highlight the urgency of this problem for the POA and residents. Excessive speed also increases road wear and maintenance costs, such as resurfacing due to dust damage. Traffic calming measures aim to improve safety and create a more welcoming environment for all residents and visitors.

Figure 1: Bull Domingo Ranch

Traffic Calming Implementation: Evaluation of Strategies

Gate Installation

The BDR POA Board reviewed the feasibility of installing gates at each public access to limit non-resident related traffic. Ultimately, they determined that gates presented numerous challenges, including delayed access for emergency services, increased maintenance and repair costs, ongoing technical issues, and significant inconvenience for residents, guests, and service providers. Additionally, gates do not effectively address the root cause of the prevailing safety concerns. Gates are a divisive and costly measure that do not serve the entire community or create a meaningful improvement in safety. Therefore, the Board has determined that gates are not the right solution for the community.

Radar Speed Signs

The POA has ordered solar radar speed signs with feedback that they will continue to relocate throughout BDR. Radar speed signs with feedback placards can effectively reduce speeds while collecting useful traffic data when used strategically. Their effectiveness is maximized by rotating locations, comparing before-and-after data, and reinforcing other traffic calming measures.

1. Rotate signs every 2–4 weeks to prevent driver habituation and maintain effectiveness.
2. Collect before, during, and after speed data (focus on 85th percentile and % speeding).
3. Place signs in high-visibility locations with good sight distance.
4. Use data to identify problem areas and guide future traffic calming decisions.
5. Pair with measures like speed dips and gather feedback from residents and drivers.

Speed Attenuation Alternatives

The POA has examined different types of speed attenuation alternatives. Alternatives that are applicable on gravel roads are limited. Here is a selected list of possible treatments for the gravel roadways within BDR:

Speed humps, bumps, and tables are among the most widely used vertical deflection measures. Speed humps are gently rounded rises, typically 3-4 inches high and 12-15 feet long, designed to slow vehicles to around 15–25 mph without causing excessive discomfort. Speed bumps are shorter and more abrupt, producing greater deceleration and are usually limited to low-speed environments such as parking lots. Speed tables are longer, flat-topped versions that can function as raised crosswalks or intersections, allowing slightly higher speeds than bumps while still calming traffic. These devices are highly effective at reducing speeds but may impact emergency response times, driver aggravation, drainage, and snow removal operations.

Speed dips function as the inverse of a hump; a shallow depression in the roadway rather than a raised feature. They are often used in conjunction with drainage features such as culverts, allowing stormwater to pass across the roadway while also encouraging drivers to reduce speed. They can also introduce maintenance considerations related to erosion and sediment buildup.

Temporary speed humps or bumps are modular devices, typically constructed from rubber or recycled materials, which can be installed and removed with relative ease. These are often used for pilot programs, seasonal traffic control, or temporary construction zones. They would allow the POA to evaluate effectiveness before committing to permanent infrastructure. While flexible and cost-effective, they tend to be less durable and may require ongoing maintenance or replacement, particularly in harsh weather conditions. As such, they are typically employed during seasonal fair weather months and removed during winter months due to snowplow incompatibility.

The POA has determined that the utilization of speed dips is the most appropriate to produce the desired speed reduction with the type of roadway construction that is present in BDR.

Speed Dips

The BOA concluded that speed dips are the appropriate traffic-calming measure for BDR's high-elevation, private gravel road network. The selection process drew on input from emergency responders, county planning and zoning, legal counsel, and the Association's insurance carrier, and was benchmarked against accepted practice in comparable communities. Speed dips were favored over gates because they reliably moderate vehicle speeds while preserving unimpeded access for emergency response, snow removal, and routine maintenance. Unlike gates, dips can be regraded, relocated, or removed as conditions change with relatively low cost, allowing the BOA to adjust the program over time on the basis of observed results rather than committing the community to permanent, costly infrastructure.

When a speed dip is co-located with a culvert crossing, or when a damaged culvert is being replaced and the dip is constructed at the same location, the combined depression can function as a low-water crossing. Whether this is intentional or unintentional, the culvert at any such location should be sized and maintained to carry the expected drainage flows without clogging or overtopping. Otherwise, the dip itself becomes the conveyance, and without adequate armoring the resulting flow can erode the road surface, compromise the subgrade, or render the segment impassable. For that reason, dip-and-culvert installations should be limited to locations where an alternative route is available, so that no portion of the community would be inaccessible during a significant storm event.

Speed Dip Location and Installation Guidelines:

To ensure the effectiveness and safety of speed dip installations throughout BDR, the following location guidelines should be observed:

1. Speed dips should not be placed on curves. Installing speed dips on curved sections of roadway can reduce driver control and increase the likelihood of crashes or loss of vehicular control. Additionally, curves naturally produce speed attenuation due to the rate of curvature.

2. Speed dips should not be located at the bottom of hills. Placement at the bottom of slopes may result in vehicles reaching excessive speeds before encountering the dip, reducing its intended effectiveness and potentially causing vehicle damage.

3. Speed dips should not be installed at the top of hills. Locations immediately following cresting hills can limit driver visibility and reaction time, increasing safety risks.

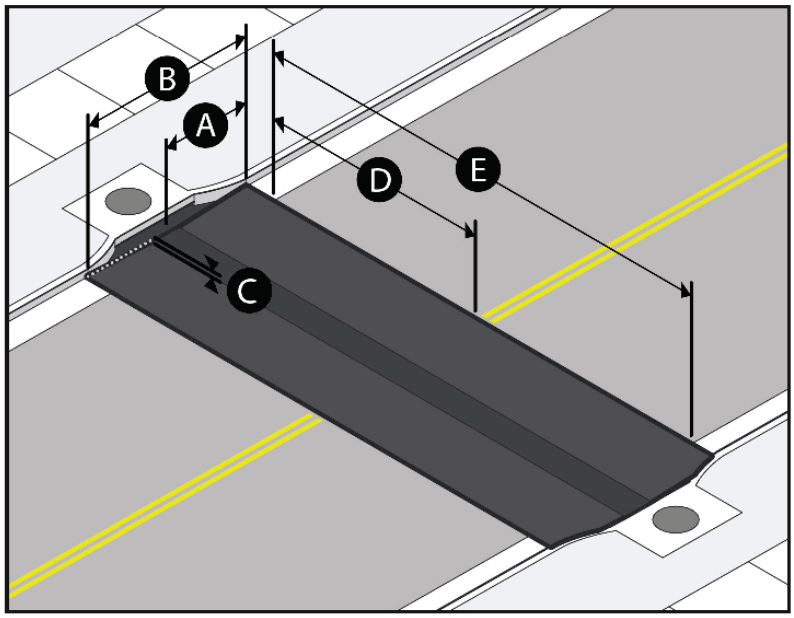
4. Adequate sight distances must be maintained based on the posted speed limit. Drivers should have sufficient visibility to safely see and respond to upcoming speed dips in accordance with the community's 30 mph limit. Advanced warning signage is discussed in the next section.

5. Appropriate warning signage should be installed in advance of every speed dip. Clearly visible signage alerts drivers to the presence of speed dips, improving compliance and safety for all road users. The advanced warning signs need to have a good sight line and be visible from a minimum distance of 250 feet.

6. Other considerations may include evaluating drainage impacts, accessibility for emergency vehicles, noise concerns, and input from residents regarding specific locations, to further ensure the safe and consistent application of speed dips across the community's roadway network.

Speed Dip Geometry

The design of the speed dips will impact vehicle speed required to navigate the deflection. Vehicles with lower clearance will be more impacted than those in high-clearance vehicles. There is little guidance given for the installation of speed dips on gravel roadways. The City of Colorado Springs' *Neighborhood Traffic Management Plan* uses the following geometry for applications on roadways with posted speeds of 30mph or less. Even though this application is for paved streets, the geometric recommendations will serve as a good starting point for Bull Domingo's rural 30mph roadways' traffic attenuation.



Speed dips are similar in design to speed humps or tables, only depressed (concave).

TYPICAL DIMENSION RANGE

- A 6′ - 7′
- B 12′ - 14′
- C 2″ - 4″
- D Lane width
- E Pavement width

Service/Public Outreach

A public outreach plan for the BDR traffic calming project should keep residents, delivery companies, and service providers informed and engaged throughout implementation. Communications should emphasize safety improvements, coordination with emergency services, and transparent use of aggregated speed data for monitoring and enforcement support.

1. Post project updates on the BDR POA website and Facebook page with clear timelines and maps of traffic calming locations.
2. Send formal notices to FedEx, UPS, and utility providers.
3. Determine if notice will be given for observed repeat violations.
4. Coordinate with the Sheriff to communicate increased patrol presence during rollout and peak summer periods.
5. Notify residents of expected changes and impacts through email updates and community notices, including emergency service coordination efforts.

Advanced Signage

Updating the entrance signage to read “30 mph unless otherwise posted”, along with notice that traffic-calming measures are in effect is recommended at all public accesses to BDR.

R2-1
24”x30”

W8-2 Special
30”x30”

R2-5P
24”x18”

Additionally, advanced warning signage is necessary to warn drivers of the need to slow down to navigate the speed dip installations. The speed differential between the 30mph posted speed limit and 10mph speed dip is anticipated to be 20mph. Utilizing a 2.5-second perception-reaction time and deceleration rate of 10 ft/sec2, the sign legibility distance of 250 feet, per MUTCD Chapter 2C and CDOT Standard Plan S-630-1; these signs should be placed 200 feet on either side of the speed dip. A supplemental advisory 10mph speed plaque may be added. The advanced warning signs have a good sight line and be visible from a minimum distance of 250 feet.

Details of the sign requirements, retro reflectivity, and mounting height/location are found in the MUTCD. Reputable sign companies will have this information.

W8-2
30”x30”

W13-1P
18”x18”

- Locate 200 feet on either side of speed dip installation.
- A minimum of 500 feet is required between the signs per CDOT Standard Plan S-630-1.
- The advanced warning signs need to have a good sight line and be visible from a minimum distance of 250 feet.

Maintenance

1. Routine grading should be performed to restore proper crown and drainage, typically 2–4% cross slope, which helps shed water and minimize washboarding. The frequency of grading should be adjusted based on traffic volumes, weather conditions, and observed roadway deterioration (e.g., more frequent during wet seasons or peak use periods).
2. Potholes, rutting, and corrugation (washboarding) should be addressed promptly through reshaping and compaction to prevent further degradation.

3. Periodic addition of new aggregate (re-graveling) is required to replace material lost due to traffic, erosion, and snowplowing operations. Aggregate should be well-graded with sufficient fines to promote binding and reduce loose surface material.
4. Proper drainage is critical—ditches, culverts, and cross-drains should be regularly inspected and cleared to prevent standing water and erosion of the roadway surface.
5. Shoulder maintenance should ensure smooth transitions and prevent edge drop-offs, which can lead to safety concerns and roadway unraveling.
6. Compaction following grading or new material placement is essential to improve durability and reduce future maintenance frequency.
7. Vegetation control along road edges and ditches should be performed to maintain drainage functionality and sight distance.
8. Snow removal operations should avoid excessive removal of surface aggregate and maintain the intended roadway profile, including preserving speed dip geometry. Speed dips are compatible with BDR's snow removal operations that leave approximately 2" of snowpack on the roadway during winter storm events.
9. Traffic control measures, such as speed management, can help reduce washboarding and extend the life of the gravel surface.
10. Seasonal inspections (spring thaw, post-storm events) should be conducted to identify and prioritize maintenance needs across the network.
11. Spot stabilization (e.g., geotextile reinforcement or additional base material) may be necessary in areas prone to persistent soft spots or drainage issues.
12. If dust and noise become a problem on BDR's gravel roadway network, dust mitigation can be implemented. This is typically achieved by the application of Magnesium Chloride (MAG Water) on the roads.

Traffic Calming Implementation Plan Feedback

It is recommended that the BDR POA Board conduct a post-implementation evaluation of the traffic calming measures, specifically the installed speed dips, following completion of the first phase. This evaluation should include a review of radar-collected speed data at multiple representative locations throughout the subdivision to determine the effectiveness of the measures in reducing vehicle speeds. Additionally, any available crash or incident data should be analyzed to identify trends or safety improvements. Qualitative feedback should also be gathered from key stakeholders, including residents, delivery drivers, and emergency response personnel, to assess operational impacts and user experience. Finally, an assessment of roadway wear and surface integrity in the vicinity of the speed dips should be performed to identify any accelerated degradation or maintenance needs associated with the installations. This comprehensive review will help inform any necessary adjustments and guide future phases of traffic calming within the community.

Summary and Conclusions

Overall, the Bull Domingo Ranch Traffic Calming Implementation Plan reflects a thoughtful, well-documented decision-making process and is broadly aligned with the goals articulated by the POA. Please incorporate the recommendations included in this memorandum into implementation.

Please contact me directly with any questions about this information.

Sincerely,
McDowell Engineering

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Traffic/Transportation Engineer