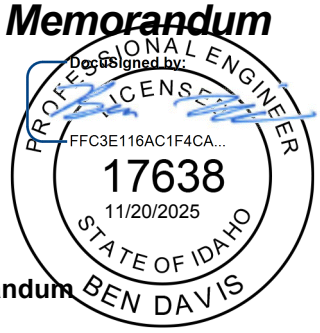
KELLER ASSOCIATES

Traffic Calming and Safety Countermeasures Technical Memorandum



TO: Jay Mazalewski, PE and Doug Self, AICP

FROM: Ben Davis, PE and Matt Steele

DATE: November 20, 2025

SUBJECT: **City of Driggs – S 5th Street & Johnson Avenue Improvements**
Traffic Calming and Safety Countermeasures Technical Memorandum

EXECUTIVE SUMMARY

The City and public have expressed concern of potentially increased vehicle speed after the S 5th Street and Johnson Avenue collector route is paved. The proposed lane width of 11-ft and signing the curve at Gilroy Lane for 15mph will mitigate speed. Given the facility context and proposed design, Keller's initial assessment of additional effective countermeasures for traffic calming includes speed cushions and raised crosswalks. Both countermeasures can be implemented with the proposed roadway dimensions and at sufficient frequency to provide meaningful effort to slow vehicle speeds and improve vulnerable road user comfort. It is recommended that a raised crosswalk be installed initially, a speed study completed post-construction, and additional countermeasures be phased in as needed.

PROJECT CONTEXT

The City of Driggs is improving S 5th Street and Johnson Avenue from Little Avenue to Main Street (SH-33). Currently the corridor is an unpaved, treated gravel roadway within city limits. The proposed improvements include paving the roadway with two travel lanes, separated shared use path, sidewalk, and buffer areas.

Figure 1: Project Location and Extents

Residential development is anticipated north of Johnson Avenue and west S 5th Street. The improved corridor will provide multimodal mobility and access to many residences. Other internal road extensions are expected, such as Teton Avenue, creating a grid of other connections between the residential development and Main Street (SH-33) and Little Avenue. The corridor is also expected to serve large vehicles including dump trucks, recycling trucks, and delivery vehicles.

The posted speed limit is 25 miles per hour (mph) and the corridor improvements will not change the speed limit. Only one crash has occurred according to the most recent 5 years of available crash data – a single property damage only crash, during snowy and rutted conditions. The intersections at either end of the project extents, Main Street/ Johnson Avenue intersection and Little Avenue/ 5th Street intersection, have experienced seven crashes in total over the past five years of available ITD crash data. These crashes are property-damage only. Improvements to these two intersections are included in the City's Transportation Master Plan.

Per the summary above, the corridor characteristics relevant to a safety countermeasure examination are tabulated in **Table 1** below.

Table 1: Corridor Characteristics

Corridor Characteristic	Description
Number of Lanes	2 lanes
Posted Speed	25 mph
Functional Classification	Minor Collector
City Standard Cross-Section	Residential Collector
Adjacent Land Use Contexts	Residential Development
Route for Larger Vehicles?	Yes
Public Transit Stops	No
Lighting	Yes, at City street intersections
Sidewalk	Yes, from Gemstone Ave. to Teton Ave.
Shared Use Path	Yes, from Teton Ave. to Main St. (SH-33)
Bicycle Facilities	Yes. Pathway only, no bike lanes.
Right-of-Way	60-ft
Crash History (2019-2024)	One Crash (Property Damage Only)

SAFE SYSTEM APPROACH

Modern transportation safety best practices include adopting a Vision Zero Mindset – that the only ethical design approach is one that acknowledges that even one roadway fatality is unacceptable. As part of an industry commitment to reach a goal of zero deaths on our roadways, the Federal Highway Administration has adopted a Safe System Approach. This proactive safety approach is rooted in the fact that humans make mistakes, and the human body is fragile.

Figure 2: The Safe Systems Approach (Source: Federal Highway Administration)

The Safe System Approach uses a five-layer multi-disciplinary process of creating mitigations that, when a crash occurs, reduces the severity of the crash. The six principles that guide Safe System Approach are:

1. Deaths and serious injuries are unacceptable.
2. Humans make mistakes.
3. Humans are vulnerable.
4. Responsibility is shared.
5. Safety is proactive.
6. Redundancy is crucial.

The S 5th Street and Johnson Avenue corridor project will maintain a 25 mph posted speed, adhering to the safe speeds component of the SSA approach. A redundant system of safety implementations should include countermeasures that aim to create safe roads. Safety countermeasures should mitigate human mistakes and facilitate safe travel by the most vulnerable road users.

TRAFFIC CALMING COUNTERMEASURES

Per FHWA guidance[1] and given the context and roadway characteristics, there are several traffic calming countermeasures worth exploring for S 5th Street and Johnson Avenue Improvements (see Table 2 below). These options are appropriate for collector or residential collector streets that also serve an emergency access function. Descriptions and application details are provided in the following subsections.

Table 2: Possible Traffic Calming Measures

Traffic Calming Element	Application
Narrow Vehicle Lanes	Project-Wide
Lateral Shift	Segment
Realigned Intersection	Intersection
Raised Crosswalk*	Segment
Speed Cushion	Segment
Offset Speed Table	Segment
Corner Extension	Intersection
Choker	Segment
Median Island	Intersection & Segment

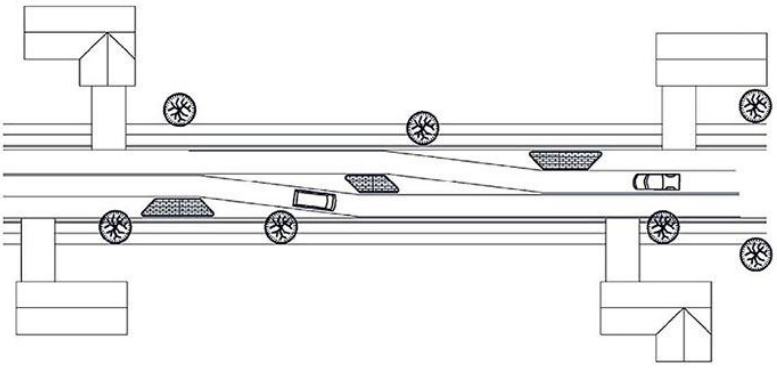
*See caveat for primary access route concerns in the respective section below.

LANE WIDTHS

Lane widths less than 12-feet encourage slower driving speed, thereby reducing the severity of vehicle crashes. Given that S 5th Street and Johnson Avenue can be expected to serve a low volume of larger trucks, 11-foot lanes would be an acceptable width to accommodate larger vehicles. Additionally, the Residential Collector cross-section does not have a shoulder width; therefore, the lessened overall road width is expected to reduce speed.

LATERAL SHIFT

A lateral shift realigns straight lanes to shift slightly in one direction. Lateral shifts are primarily aimed at reducing motor vehicle speeds along a street, with the aid of a median island preventing motorists from crossing the centerline.



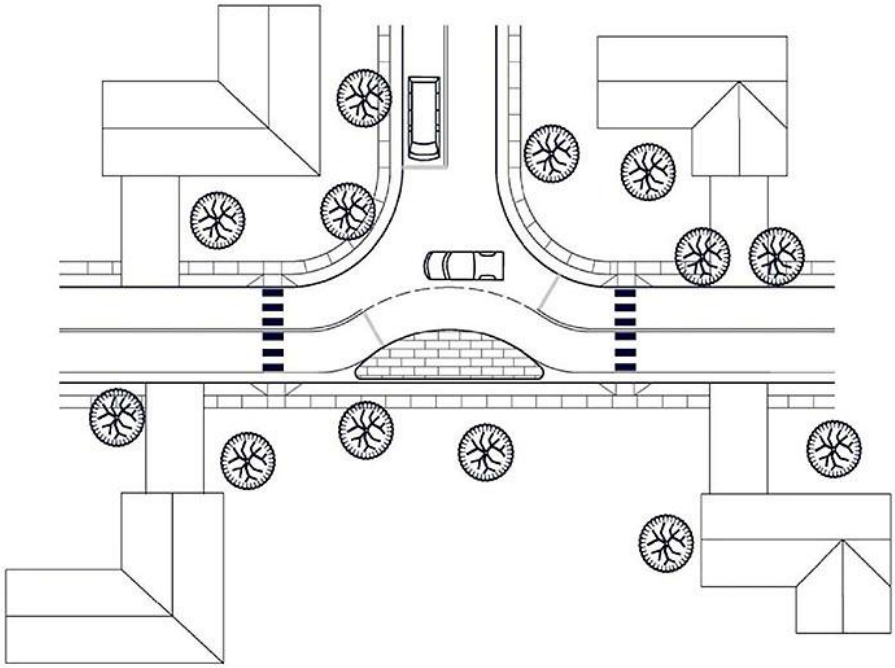
Lateral Shift Applications:
- Appropriate up to 35mph
- Appropriate for all traffic volumes
- Appropriate along a primary emergency and/or industrial access route
- Primary safety benefit – slower speeds

Figure 3: Lateral Shift Schematic (Delaware Department of Transportation)

Conclusion: The 5th Street and Johnson Avenue corridor doesn't have on-street parking, making this configuration difficult to achieve without shoulders. Roadway widening to accommodate this does not capitalize on the proposed typical section and would not be an optimal approach.

REALIGNED INTERSECTION

A realigned intersection adds a physical feature that skews approaches. This traffic calming feature is typically applied at T-intersections with approaches intersecting at right angles. The primary purpose of intersection realignment is to discourage fast vehicle movements.



Realigned Intersection Applications:

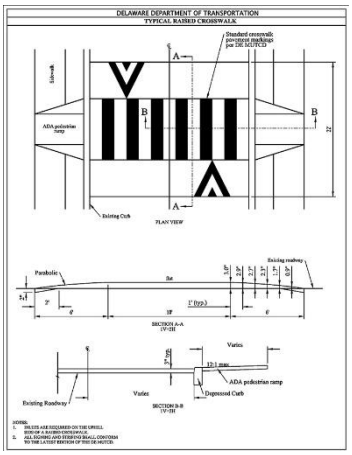
- Applied at T-Intersection
- 25mph ideal application
- If appropriate turning radii can be applied, applicable on emergency and/or industrial access routes
- Adequate signage in advance of the intersection should be balanced with sight distance

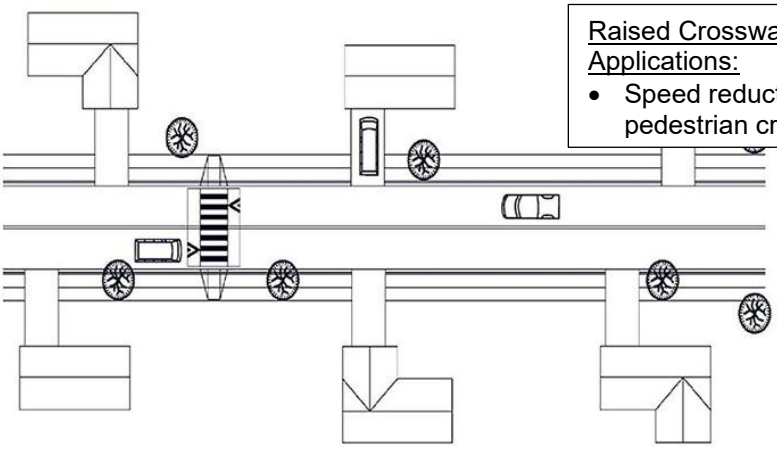
Figure 4: Realigned Intersection Schematic (Delaware Department of Transportation)

Conclusion: This countermeasure is unfamiliar to residents and may cause discomfort to motorists. While the roadway configuration would be conducive to this countermeasure, a lack of community support would be counterproductive to a broader effort towards safety.

RAISED CROSSWALK

A raised crosswalk is a crosswalk raised between 3 and 6 inches above a street typically with a 10-foot width, typically 22 feet in length. Raised crosswalks can be implemented at midblock locations or at intersections, usually flush against roadside curbs (alternatively constructed to an open section). While raised crosswalks are appropriate for low speed (45 mph or less) facilities, they are generally not recommended on roads that serve as primary emergency routes or industrial access routes.





Raised Crosswalk Applications:

- Speed reduction at pedestrian crossings

Figure 5: Raised Crosswalk Schematic (Delaware Department of Transportation)

Conclusion: A raised crosswalk would be familiar to the community and effective at calming traffic in advance of the proposed crossing between the multi-use paths at Teton Avenue and Gemstone Avenue.

SPEED CUSHION

A speed cushion functions similarly to a speed hump, causing discomfort to drivers travelling over 25 mph by causing vertical deflection. Unlike a speed hump, a speed cushion has “cutouts” within the raised area that permit large vehicles with wide tracks – i.e. emergency vehicles, large trucks, buses – to drive over them without experiencing vertical deflection. Typically, the large vehicles are still forced to slow down to navigate the speed cushion.

Speed Cushion Applications
- Appropriate along low speed local roads and collectors
- Accommodates vehicles with wider wheelbases
- Recommended series spacing between 250 and 500 ft
- Midblock placement is recommended 150 feet from an unsignalized intersection and 250 feet from a signalized intersection

Figure 6: Fire Truck Approaching Speed Cushions (FHWA, via Jeff Gulden)

Conclusion: Speed cushions would be an effective means of slowing vehicle speeds while accommodating expected larger vehicle traffic. Considerations will have to be made regarding winter maintenance (i.e. snowplows), which can be addressed by communication with maintenance partners and/or seasonal installations. Delineators and signage are recommended to remind plow drivers of the speed cushion location. Additionally, removable speed cushions are an option, and they could be removed during winter months.

OFFSET SPEED TABLE

Offset speed tables are raised areas spanning across the length of the roadway, split down the centerline of the street and both halves offset longitudinally. Unlike standard speed tables, offset speed tables allow emergency response vehicles to pass through them without delay – while slowing most passenger cars via a 10-foot flat top.

Offset Speed Table Applications

- Appropriate for local and collector streets with a posted speed limit of 30mph or less
- Offset halves spaced 50 feet longitudinally
- Ideally placed at midblock locations, 150 feet from unsignalized intersections and 250 feet from signalized intersections.
- Recommended series spacing of 250 to 500 feet
- Larger vehicles usually cross at slower speeds than personal passenger vehicles

Figure 7: Offset Speed Table (FHWA, via Jeff Gulden)

Conclusion: Communication with the City indicates there is reluctance to implement offset speed tables for fear of passenger vehicles performing serpentine maneuvers (S-turns) to avoid them. While this is a function of driver education, shorter longitudinal spacing could increase the discomfort of a driver swerving around the tables.

CURB EXTENSIONS

Curb extensions narrow roadway sections by extending sidewalk on either side of the street. Curb extensions at intersections are called corner extensions or bulb outs; at midblock locations, they are called chokers. The primary purpose of curb extensions is to enhance the pedestrian experience by shortening crossing distances, increasing visibility of people walking, and slowing automobile turning speeds.

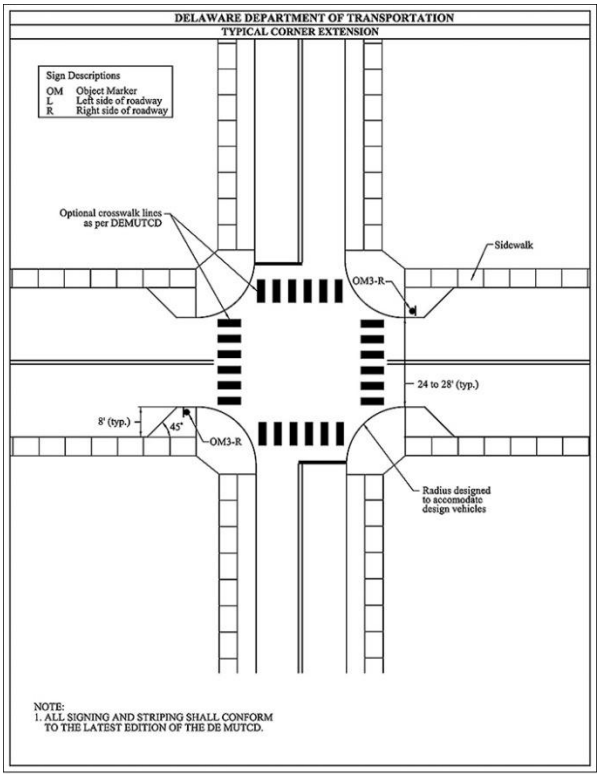


Figure 9: Curb Extension at Intersection Schematic (Delaware Department of Transportation)

Curb Extension Applications:

- Considerations must be made for existing drainage system.
- Requires urban context
- Slows turning vehicles

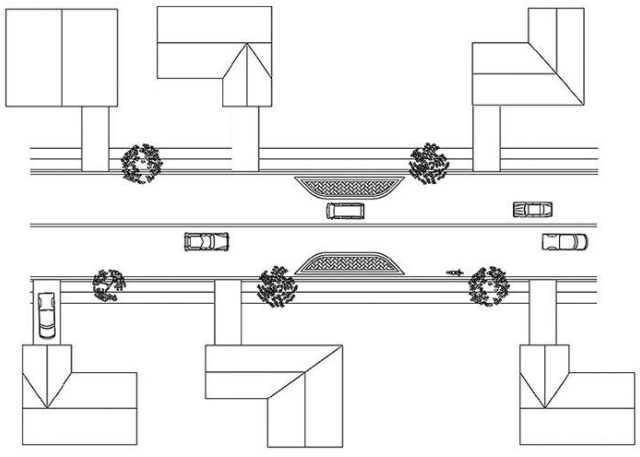
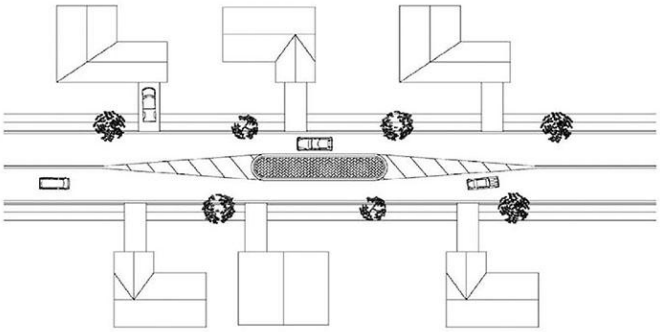


Figure 8: Choker Schematic

Conclusion: Given the proposed roadway design, little shoulder room is provided to make choker implementation feasible. Similarly, curb extensions onto S 5th Street and Johnson Avenue are not feasible. Curb extensions could be explored along future local roads connecting to S 5th Street and Johnson Avenue where on-street parking is provided to slow turning vehicle movements while shortening pedestrian crossing distances.

MEDIAN ISLAND

A raised island located in the center of a street can narrow the roadway cross section, and consequently narrow travel lanes and encourage people driving vehicles to slow. Painted areas may be used in lieu of vertical islands. Median islands can double as pedestrian refuge islands when implemented at crossing locations and cut outs to allow pedestrians to pass.



Median Island Applications:
- Urban or suburban setting
- Can be placed midblock or at an approach of an intersection
- Applied on roadways with sufficient width and can double as a pedestrian refuge for a pedestrian crossing.

Figure 10: Median Island Schematic (Delaware Department of Transportation)

Conclusion: The proposed roadway configuration does not provide significant lane nor shoulder width to implement an effective median island. Adjustments could be made to the proposed design to increase available roadway to implement a median island; however, this would be a large expense that would only be made to accommodate the countermeasure, rather than the countermeasure utilizing the existing configuration to maximize an opportunity for traffic safety.

SPEED DIPS

Speed dips are a traffic calming strategy that induces vertical deflection by installing a recession, or “dip” in the roadway – akin to a speed hump. Speed dips are currently implemented as a traffic calming measure in the City of Driggs on Little Avenue and N 5th Street; however, they are deemed a “Concrete Swale Gutter” for stormwater. Speed dips are not a widely recognized traffic calming element in the United States given the lack of research into their efficacy. Flathead County, Montana has recommended the speed dip not be included in future traffic calming countermeasure options given concerns surrounding winter maintenance and lack of nationally recognized support (thus making them difficult to fund)[2]. A lack of research is indicated by the CMF clearinghouse showing no nationally recognized research effort as to the efficacy of the speed dip.

Conclusion: In general, there is public familiarity of speed dips in Driggs. Given that other vertical deflection options exist that are nationally recognized as effective traffic calming countermeasures, the City may look to other options, such as speed cushions, for a similar effect.

GILROY LANE INTERSECTION RADIUS

At the Gilroy Lane intersection, S 5th Street becomes Johnson Avenue with both northern and western legs stop controlled. The existing approach from Gilroy Lane is free flowing. Gilroy Lane is not part of the City of Driggs and serves as an access road to two properties south of the project.

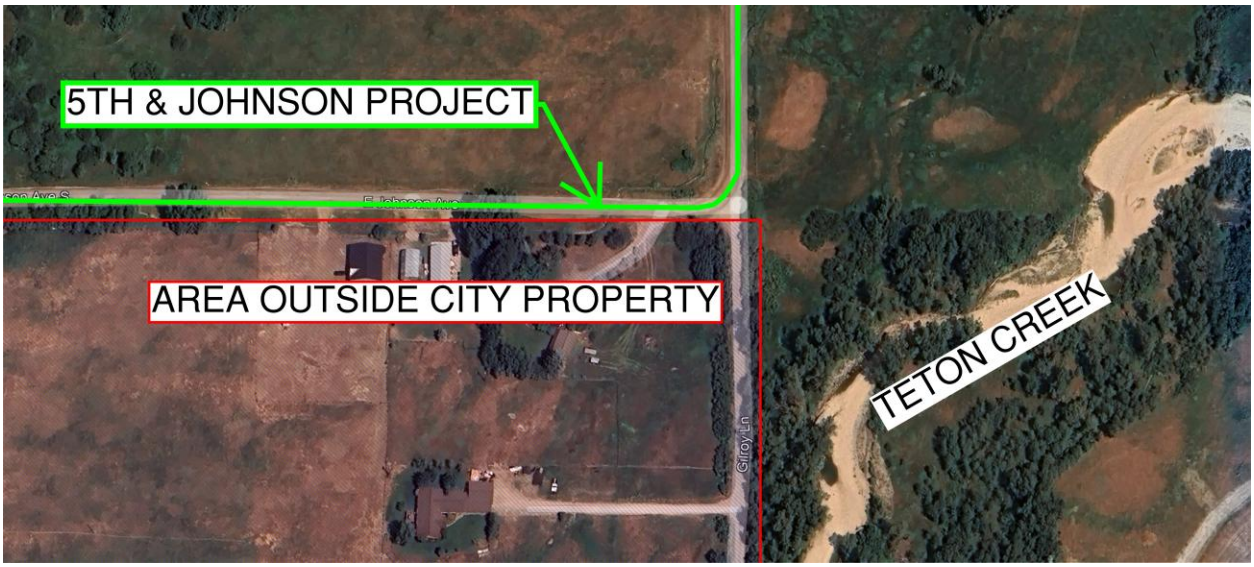


Figure 11: Land Context Surrounding Gilroy Lane

Much of the design approach for the S 5th Street and Johnson Avenue project is predicated on future development in the subdivided area northwest of the corridor increasing traffic volumes. The intent is for the corridor to serve as a minor collector without numerous stop-controlled intersections to flow traffic. Key factors that influence this approach are illustrated in **Figure 11** above, and broadly are:

- Gilroy Lane and the adjacent land is outside of the City of Driggs.
- Future development of the area is restricted by the proximity of Teton Creek, and current low traffic demand from Gilroy Lane.

With these factors in mind, the intersection of Gilroy Lane and Johnson Avenue / S 5th Street will be redesigned to better accommodate turning vehicles along Johnson Avenue / S 5th Street by implementing a stop control on Gilroy Lane (the southern leg of the intersection). Given the low-speed context and constrained right-of-way, the AASHTO Green Book indicates a 4% superelevation rate which at 25 mph would result in a rounded radius of 154 feet. A low-speed urban design using the 4% e^{max} Table the AASHTO Green Book and 4% superelevation for 25 mph would require a curve radius of 154 feet. A lesser design speed could be used to better fit available right-of-way provided proper turn warning and advisory speed signs were employed. A reduced speed curve signed at 15mph is recommended to serve as a traffic calming safety countermeasure.

SEASONALITY, SPACING, AND PHASING CONSIDERATIONS

Several traffic calming elements are recommended per this study. It is understood that the proposed corridor reconstruction and future development will dramatically alter the context and safety challenges established in this study.

1.1. SEASONAL CONSIDERATIONS

The City of Driggs experiences on average 65 inches of annual snowfall[3]. Maintenance procedures for snow plowing along this corridor follow a “white top” policy, wherein plows will not plow to the roadway surface entirely, only removing the topmost layer of snow. It is understood that drivers in the community, being familiar with this white top policy, will exercise greater caution operating vehicles during the winter at slower speeds. Conversely, traffic calming countermeasures may have greater efficacy to slow vehicles in warmer months when roadway conditions are more conducive to speeding vehicles. If countermeasures

are left in place during winter, they can be delineated with sign delineators at both ends to designate their location to plow drivers.

1.2. SPACING CONSIDERATIONS

Spacing of countermeasures in series should be in the range of 300 to 350 feet. A follow-up study for seasonal installation should explore spacing in further detail and be engineered to fit corridor constraints. Should speed cushions be implemented this spacing should be considered with locations between primary intersections.

1.3. PHASING CONSIDERATIONS

A phased approach to traffic calming countermeasures is a logical option. Conversations with the City indicate that there is an appetite for implementing the most critical traffic calming countermeasures (i.e. raised crosswalks) with the project and phasing other traffic calming measures (i.e. speed-cushions) at a future date. The most critical countermeasure was identified as the raised crosswalk, which serves to slow vehicles and aid vulnerable road users crossing the road. The raised crosswalk was the most publicly accepted option at the City's public open house. A speed study should be completed after construction of the project. Should speed concerns be prevalent, then speed cushions can be phased into the project. It is possible to implement speed cushions as either a permanent or removable option.

RECOMMENDATIONS

The Residential Collector road section is recommended with 11-ft travel lanes. The combination of this lane width and no shoulders is expected to inherently reduce speed.

It is recommended that the City pursue raised crosswalks at shared-use pathway crossings at Teton Avenue and Gemstone Avenue. These crossings will provide complete network connectivity between the new shared use path and the existing shared use path. Moreover, the placement of these raised crosswalks in relative proximity to each other will encourage drivers to maintain slower speeds along a section of the corridor more likely to experience users crossing. Rapid Rectangular Flashing Beacons (RRFBs) should supplement the raised crosswalks, with a pair facing each direction of traffic at each crosswalk location.

The City should conduct a speed study along the corridor following the project improvements. Seasonal variations in driving conditions may indicate that additional traffic calming measure implementation is only needed during warmer months. If a speed study indicates that drivers are operating at speeds more than the posted speed limit, speed cushions can be implemented every 300 to 350-feet (pending the recommendation of a speed study) along the corridor, with 150-foot offsets from unsignalized intersections. MUTCD compliant signs advising drivers of the speed cushion location should be implemented to avoid significant damage to vehicles operated by drivers unfamiliar with the roadway.

Gilroy Lane's intersection should be signed appropriately give driver's advance warning the upcoming curve, which may be designed to a 15mph curve radius with advanced warning signage to accommodate right of way constraints and further calm traffic.

REFERENCES

***Reference 1**: Federal Highway Administration. Toolbox of Individual Traffic Calming Measures.*

***Reference 2:** Montana Department of Transportation. North Fork Flathead Road Final Corridor Study. September 2010.*

***Reference 3**: Western Regional Climate Center. https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?id2676.*