



CDOT Region 2 Chain Up Stations
Town of Blue River Meeting
Feb. 10, 2021



NB & SB CO 9 Chain Up Stations



This project is intended to design 3 chain-up stations along the US 285 and CO 9 corridors that will provide safe locations for vehicles (primarily Commercial Motor Vehicles) to mount tire chains prior to both Kenosha Pass and Hoosier Pass. These locations improve driver compliance with the chain law, allow CSP to enforce the chain law when active and result improved traffic operations of these highways (Fewer back ups and closures).

The design and construction of these three locations is paid for using Federal Freight Funding. So, while there is some flexibility in the design of these stations, Federal Freight funding does have specific limits what types of improvement can built using them

- 1) **Hoosier Pass/CO 9** - design of two chain-up stations on each direction of CO 9, one on southbound direction CO 9 in the Town of Blue River in Summit County (CDOT Region 3) and one on northbound direction of CO 9 in the Town of Alma in Park County (CDOT Region 2)
- 2) **Kenosha Pass/US 285** - design of one chain-up station on southbound US 285 (CDOT Region 2) near the unincorporated community of Grant.



Project Purpose

- Vehicle Traction Issues during and resulting from winter mountain storms create both safety and operational issues on steep grades of CO 9 over Hoosier Pass and on US 285 of Kenosha Pass.
- Closures on I-70 resulting from traffic incidents, and inclement weather often pushes drivers to use CO 9 and US 285 as an alternate route.
- Commercial vehicles, not using traction devices, traveling on CO 9 and US 285 when the chain law is in effect result in major back-ups and closures.



The overarching purpose of this project is to improve both safety and traffic operations on both CO 9 and US 285 when:

Winter Traveling conditions warrant the use of vehicle traction devices on the steep grades of Hoosier Pass and Kenosha Pass.

On several occasions when I-70 is dealing with traffic incidents, inclement weather or closures, Drivers use the combination of CO 9 and US 285 as an alternate route into and out of the Mountains.

By improving compliance of commercial motor vehicles with the chain law helps to reduce major backups and closures along these corridors.



Project Purpose (continued)

- Responding to stranded commercial vehicles that have lost traction on these steep grades requires CDOT Maintenance forces to mobilize equipment to move them out of traffic which takes away from snow removal operations on the highway.
- CSP will not typically enforce the chain law when adequate provision has not been made for drivers to safely mount traction devices.
- Need for safe area to allow truck drivers to stop and chain up that does not impede traffic on the corridor.



Responding to stranded trucks requires CDOT maintenance forces to focus their efforts to get the truck moving or into a safe location out of traffic which pulls their attention away from snow removal operations.

In extreme situations, Truck Heavy Tow vehicles need to be dispatched which can result in closures until the truck can be moved.

A designated, safe pull-off encourages voluntary compliance from CMV drivers to mount tire chains during the chain law.

without safe pull outs law enforcement is not willing to enforce the to issue citations that result in fines

Corridors that do not provide safe locations for CMV driver to chain-up, CSP is not willing, nor do they have the ability to safely enforce the chain law.



Safety Benefits

- Minimizes chaining activities in unsafe locations
- Reduces the personal exposure for drivers when chaining their vehicles by providing physical separation between the travel lanes of the highway and the designated chain-up area.
- Minimizes maintenance requirements and provide ITS Signing
- Provide safe ingress and egress from the adjacent highways
- Reduced speed limit when chain law is implemented.



Looking at it from a corridor safety perspective, well designed chain-up stations will.

Minimize occurrences of trucks chaining up in unsafe locations (partially blocking travel lanes, driveways or side streets)

Reduces the personal exposure of truck drivers to safety concerns while they are focused on installing tire chains

Minimizes the time it takes for maintenance to implement the chain law, and reduces their exposure to safety issues through the use of ITS signs that can be turned on automatically.

Provides safe egress from the adjacent highway and safe ingress back into traffic when they have finished installing their tire chains

Reduced the posted speed limit by 10 MPH every time the chain law is implemented. This is done using variable speed limit signs. This speed limit reduction is absolutely enforceable because the time and dates are tracked along with the chain law.

From an environmental point of view, Chain stations have been shown to have positive

impacts to
noise
air quality
Water quality

A designated chain station encourages drivers to chain up and ultimately avoid crashes and potential HAZMAT situations.



Location Selection Criteria

- Chain-up Station locations to be in close proximity to the locations where chain law is put into effect.
- Locations need to provide adequate sight distance to the highway.
- Include enough temporary parking spaces to accommodate the projected number of trucks for a given location.
- Offer adequate lighting and positive separation to ensure the safety of the drivers as they mount traction devices.
- Provide proper advance warning signs that is consistent with chain stations statewide.

When identifying potential chain up stations it is important to consider locations that:

- are in close proximity to the locations where the chain law are put in effect and located in flatter locations prior to the steep grades.
- Locations that provide adequate sight distance to the highways (avoiding curves and short hills)
- Locations that provide enough temporary parking to accommodate the projected number of trucks using the corridor.
- and Locations need to have electrical service nearby to facility adequate lighting.



Location Selection Criteria

- Chain stations aim to avoid:
 - multiple small chain station locations
 - CMVs stopping on the road
 - large environmental impacts
 - access points for residential driveways



The things that need to be avoided when selecting chain-up station locations are:

- multiple small chain station locations
- Locations that may allow CMVs stopping on the road
- Locations that would create larger impact to the environmental (tree removal, large cuts into the slope and potentially creating physical barriers for wildlife.
- Locations that adversely impact access points for residential driveways and side streets.



Chain Up Station Operations

- Typically, only used when chain law is in effect.
- Trucks have up to 30 minutes to chain up.
- Long term parking is not allowed
- Chain law enforcement typically by CSP, but have also utilized local law enforcement through IGAs
- Trucks without traction devices can be turned around.
- Trash and snow removal by CDOT.
- Lighting to be in use only when needed (nighttime and during low visibility)



This Slide provides a quick overview of how chain-up stations work:

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Lighting



- A truck driver was struck and killed since he wasn't visible when putting chains on the truck.
- Lighting improves visibility of people in the chain station
- Lighting provides wayfinding when pulling into the bays



Lighting Control

- Lights only on at night when chain law is in effect
- Potential of a control system
 - Dimming lights prevents over lighting
 - Dim lights in unused bays
 - Dim lights during non-standard use
- Controlled optics
 - Light distributed only along truck ramp
 - Shields to minimize glare
 - Lights aimed towards truck





Traffic Growth from 2016-2019



This Slide provides an overview of traffic conditions on CO 9

The Bar chart on the left side of the slide shows the Annual Average Daily Traffic for Southbound CO 9 during the winter months

The number in the blue portions is the number of passenger vehicles
The number in grey is the number of trucks.

As you can see the average daily traffic grows steadily between 2016 and 2018 (approximately 600 vehicles each year) and seems to level off a bit between 2018 and 2019.

On the Right side of the slide, we can see the Annual Average Daily Traffic for both directions of CO 9 during the winter months.

Again, the blue is passenger vehicles, and the grey is the number of trucks.

Looking total traffic on CO 9 we see a steady increase each year between 2016 and 2019.



Traffic Volumes

- CO 9-SB Current & future passenger vehicles and truck volumes

CO 9-SB	Average Day	10 th Busiest Day
2019 Daily Volume (All Vehicles)	10,714 vehicles/day	15,817 vehicles/day
2019 Peak Hour Volume (Trucks Only)	23 trucks/hour	33 trucks/hour
2019 Peak Hour Volume (Trucks Only During Chain Law) [15% reduction]	20 trucks/hour	28 trucks/hour
Growth Factor (2019 to 2045)	1.47	1.47
2045 Daily Volume (All Vehicles)	15,750 vehicles/day	22,235 vehicles/day
2045 Peak Hour Volume (Trucks Only)	34 trucks/hour	49 trucks/hour
2045 Peak Hour Volume (Trucks Only During Chain Law) [15% reduction]	29 trucks/hour	41 trucks/hour

The Traffic information from the previous slide can be broken down to help us understand how many temporary spaces we need to account for during chain law events.

Looking at 2019 data because of COVID impacts to traffic on highways in Colorado we find that on the average day during a chain law event we are estimating 20 trucks per hour which increases to 28 trucks during the 10th busiest day.

When we apply a growth factor from 2019 data to 2045, we see the same numbers increase from 20 to 29 trucks an hour on the average winter day, and the 10th busiest winter day, the number increases from 28 to 41 trucks an hour.



Traffic Volumes

- CO 9-NB Current & future passenger vehicles and truck volumes

SH9-NB	Average Day	10 th Busiest Day
2020 Daily Volume (All Vehicles)	11,401 vehicles/day	14,865 vehicles/day
2020 Peak Hour Volume (Trucks Only)	19 trucks/hour	25 trucks/hour
2020 Peak Hour Volume (Trucks Only During Chain Law) [15% reduction]	16 trucks/hour	21 trucks/hour
Growth Factor (2020 to 2045)	1.41	1.41
2045 Daily Volume (All Vehicles)	16,075 vehicles/day	20,960 vehicles/day
2045 Peak Hour Volume (Trucks Only)	27 trucks/hour	35 trucks/hour
2045 Peak Hour Volume (Trucks Only During Chain Law) [15% reduction]	23 trucks/hour	30 trucks/hour



Traffic Volumes

- US285-SB Current & future passenger vehicles and truck volumes

US285-SB	Average Day	10 th Busiest Day
2020 Daily Volume (All Vehicles)	11,761 vehicles/day	15,952 vehicles/day
2020 Peak Hour Volume (Trucks Only)	43 trucks/hour	59 trucks/hour
2020 Peak Hour Volume (Trucks Only During Chain Law) [15% reduction]	37 trucks/hour	51 trucks/hour
Growth Factor (2020 to 2045)	1.56	1.56
2045 Daily Volume (All Vehicles)	18,347 vehicles/day	24,885 vehicles/day
2045 Peak Hour Volume (Trucks Only)	67 trucks/hour	92 trucks/hour
2045 Peak Hour Volume (Trucks Only During Chain Law) [15% reduction]	58 trucks/hour	80 trucks/hour



Chain Law Occurrences

- Number of times chain law was active

	SH 285	CO 9
2016	19	51
2017	28	71
2018	29	100
2019	83	166



This slide shows the number of times the chain law was implemented each year.

This information shown is in both directions of the highway

Please keep in mind that some days implement the chain law multiple times)

So that means in 2019, the chain law was implemented 166 times on CO 9.



CO 9 Active Chain Law Days

- Number of days chain law was active.

	# of Days
2016	48
2017	58
2018	63
2019	79

- Day vs Night

	Day	Night
2016	61.2%	38.8%
2017	61.7%	38.3%
2018	66.7%	33.3%
2019	61.7%	38.3%



The upper portion of this slide breaks down the number of days the chain law was active on CO 9.

So, we can see in 2019 the chain law was in effect 79 different days on CO 9

The Lower portion of this slide breaks out the percentage of day that the chain law was in active during nighttime hours.

That means that on CO 9 the Chain Law was active during approximately 30 nights.

Keep in mind that this data is shown for both the northbound and Southbound directions of CO 9.



Proposed SB CO 9 Chain Up Station

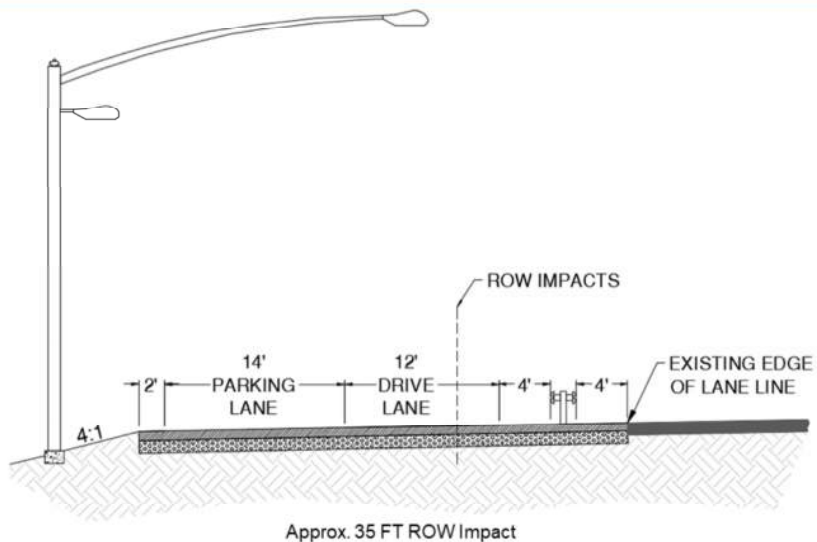


Now applying typical chain station standards used in Region 2, and considering location criteria and truck traffic volumes, CDOT and our team have selected this location for the SB CO 9 Chain-up Station.

This slide shows the approximate footprint that a standard chain-up station would take to create 13 truck parking spaces that would accommodate up to 26 trucks each hour.



Typical Section with Light Standards



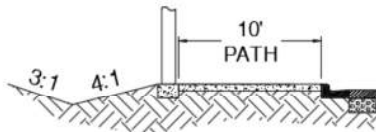
So the layout from the previous slide is based on this standard typical section for Chain-up stations currently being applied in Region 2. This has been our starting point for design, but I would like to reemphasize that today's meeting is to get your comments and concerns to find a solution that work for all the stakeholders in this project.

From the existing edge of pavement (on the west side) the additional widening would be approximately 50' which would require about 35 feet of additional ROW on the West Side.



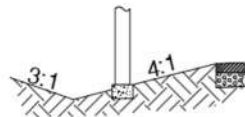
Visual Impact Mitigation & Ped Consideration

MULTI-USE PATH



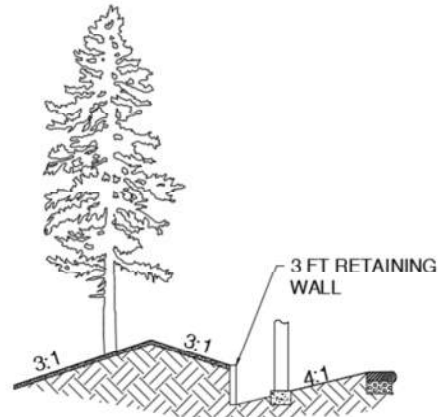
Approx. 49 FT ROW Impact

WATER QUALITY DITCH



Approx. 40 FT ROW Impact

WATER QUALITY DITCH & BERM



Approx. 52 FT ROW Impact



Local Issues Identification

- Posted speed limit of CO 9 through the Town of Blue River
- General location and impacts from Lighting
- Potential of extended truck parking.
- Environmental impacts (wildlife, water quality, Noise and the potential of Hazmat/fuel spills).
- Maintenance of the chain-up facility (trash and snow removal)
- Consistent with the Summit County multi-use recreational path plan
- CO 9 Access Control Plan
- Right-of-way impacts

Last year as this project was in the information gathering phase, I spoke to Mr. Stein over the phone, and

Our design team had a virtual meeting with Michelle Eddy (on 11/24/2020) to discuss some of the local issues and concerns.

This slide provide a summary of the issues that were raised.



Addressing Local Issues

- The Chain-up facility could potentially be used during non-winter months as a bus pull outs, disabled vehicle pull-out, safe areas for Law enforcement activities and recreational parking for hiker's and mountain bikers.
- Reducing Speed limits through in the Town when chain law is in effect.
- Installing radar feedback signs on posted speed limit signs for traffic calming.
- Parking enforcement and ticketing for violations in the chain-up station can be enforced by the Town to eliminate extended vehicle parking.
- Environmental mitigations can be provided to address wildlife, water quality and lighting issues.
- The potential for Hazmat/fuel spills along CO 9 can be reduced by reducing traction issues on Hoosier Pass during chain law events.
- Chain-up station improvements may help modify driver behavior on CO 9 through the Town.

A properly designed chain-up facility in Blue River may be able to help address local issues, and provide additional benefits withing the Town limits

Streetscaping features effect the speeds that drivers are comfortable driving and can result in slower vehicle speeds. Specifically, items like medians, signals, pedestrian facilities adjacent to the highway, or on-street parking all can result in slower speeds on mainline which may justify posting a lower speed limit on the facility.



Project Timeline

- Design
 - October 2020 - November 2021
- Project ready for advertisement/bid
 - February 2022
- Construction commencement
 - Summer 2022





Contact Information

- For questions or comments, please contact:

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