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## I-25: The New Pueblo Freeway



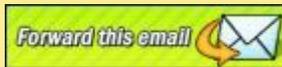
ILEX STREET TO CITY CENTER DRIVE

Colorado Department of Transportation

November 2017 eNewsletter

### In This Issue

[Ilex Team Ready for Winter](#)  
[The Science of Interstate Signs](#)  
[Final Touches on I-25 Bridge over Indiana](#)  
[Project Team Spotlight](#)  
[November Photo of the Month](#)  
[Safe Winter Driving Tips](#)  
[For More Information](#)



*Please forward/share this email with others who may have an interest in the Ilex Design-Build project.*

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### Current Design Work

- Landscaping & irrigation plans nearing completion

### Current Construction

- All roadway and structural work is complete on the I-25 over Indiana segment. Concrete stain on the substructure will begin this fall for 100% completion
- Work is complete on the Mesa bridge structure, signing & roadway. Concrete stain on the

## Ilex Project Ready for Winter Weather

Winter brings many new challenges for construction, however the I-25/Ilex project team works diligently to keep construction moving, even in cold weather. But that doesn't happen without advance planning.

For example, lane striping is one construction activity that is weather sensitive. Once traffic shifts are implemented, it's important to get the restriping of lane lines done quickly. Striping touch-ups are also necessary due to everyday wear and tear.

To complicate matters further, striping is ideally done at night to minimize impacts to the traveling public with alternating lane restrictions. It also cannot be done during extreme cold temperatures or with any sort of precipitation because the paint would freeze and wouldn't stick to the pavement. The I-25/Ilex project team continually monitors the striping and makes improvements as needed.

Traffic control devices are another critical area affected by weather. Signage and protection devices are essential on any construction project, especially when new traffic patterns are in place. During high windstorms, for example, project crews are out right away repairing/replacing damaged signs. During snow, vehicles and snowplows splash mud and snow onto signage and devices, impacting motorist visibility. They need constant monitoring during poor weather.

Paving is what many people associate with being weather-dependent; which it is. Concrete mixtures do not set below a certain temperature, and therefore all work involving the drying of concrete cannot proceed in cold conditions. Pavement also cannot be placed on frozen ground. So if frost is present, paving cannot occur until the ground temperature rises. Instead, the team can pave smaller areas of concrete with the help of ground heaters and tarps to help keep the ground from freezing, and to keep the temperature of the concrete above 32 degrees Fahrenheit.

substructure will begin this fall for 100% completion

- Piers & pier caps for the CML bridge over the railroad, abutment construction, & girder set complete
- Embankment operations between the I-25 bridges over Gruma & UPRR (railroad) underway
- US 50C Truss Bridge over Arkansas River structural rehab complete, painting & deck pour this fall
- Northern Ave bridge is in Phase 3 construction on north side of bridge removing sidewalk & repairing deck with completion in fall
- Clark and D Street cul-de-sac drainage & roadway construction complete w/remaining sidewalk, grading & landscaping completing this fall
- Mechanically Stabilized Earth (MSE) walls from Gruma to City Center Drive nearing completion
- MSE walls from CML to Gruma nearing completion
- Storm drainage installation on the north and south approaches of the project
- Bridge Deck construction on I-25 over Gruma
- Bridge deck construction on I-25 over CML
- Center piers & crash wall construction on Bridge over Phelps Creek Trails & UPRR Easement complete
- Northbound I-25 bridge over Santa Fe deck repairs

This approach does not work well for asphalt, however. Asphalt needs to stay warm while it is being placed and rolled. In addition, a thin layer of asphalt must be completely compacted within 16 minutes of application. Thicker layers of asphalt have an extended timeframe in the cold because the internal temperature of the pavement is higher. In this situation, the team has about 45 minutes to get the surface compacted and ready.



*Tarps keep concrete warm on recent bridge deck pour of the new I-25 bridge over the Union Pacific Railroad.*

Wouldn't it make sense to just start with a hotter asphalt mix in cooler weather? The short answer is, no. A hotter mix presents several problems for the installation crew and the asphalt plant. When asphalt is transported from the plant to the job site the material temperature drops. Asphalt plants may supply tarps or wrap for the trucks to prevent the hot mix from cooling off too much or too quickly, but in general variances in conditions can affect the final stability of the asphalt, causing most paving to be done in spring and summer months.

"While a few construction activities may slow during winter months, we have plenty of construction still happening," said Jennifer Billings, CDOT Project Manager. "So above all, we encourage driving slowly and observing posted speed limit signs with changing traffic patterns to ensure safety."

## The Science of Interstate Signs

Interstate signs are something seen every day, but involve a much more complex process than people may realize.

Traffic engineers follow both national and state regulations set forth by the Federal Highway Administration and the Manual on Uniform Traffic Control Devices (MUTCD).

This MUTCD has resulted in safer, more efficient travel on our Nation's roads establishing guidelines established over the past 82 years.

For example, studies have shown what size letters can be seen at certain distances, traveling at specific speeds. It was determined that a one-inch high letter is visible at 30 feet away. So for Interstate signs, the minimum letter height is 16 inches so motorists are able to read a sign while

### Upcoming Construction

- Northbound I-25 bridge over Santa Fe deck repairs
- Bridge over Phelps Creek Trail & UPRR easement
- D Street on/off ramp MSE walls & roadway construction
- Final Grading and Seeding from Gruma to City Center Drive

### Project Schedule

**Northbound I-25:** Spring 2015 to Fall 2017

**Southbound I-25:** Fall 2017 to Fall 2018

**Bridge Rehabilitations:** Summer 2015 to Summer 2017

**Final Configuration:** December 2018

**Project Completion:** April 2019

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traveling at highway speeds from an appropriate distance away.

There are also limits to the amount of text that can be placed on an Interstate sign. The human eye can only safely read a certain amount of text based on their traveling speed. A maximum of three lines of primary text is allowed on an interstate sign so as not to make the sign too crowded.

Another factor engineers need to consider is how to mount the sign, which is dictated by the sign's size. Motorists usually see either a sign bridge, or a cantilever-mounted sign.

A sign bridge is basically what it sounds like. It's a sign mounted on a structure that "bridges" the highway, secured by foundations on either side of the roadway. This method is used for large signs that extend past two lanes of traffic.

Another method to mount signs is using a cantilever, which is one foundation with the sign attached to a monotube, or "arm", that extends over the roadway. Cantilevers tend to be a slightly easier option as it is one foundation pour, versus two, and is more easily placed.



*Before photo: bridge-mounted sign*



*After photo: cantilever-mounted sign*

A factor that adds some difficulty to the signing process is the need to withstand nature's forces, such as wind. Within four miles of the foothills, Interstate signs must be able to withstand winds of 90mph, and outside that range the limit decreases to 80mph.

While traveling by an Interstate sign, something else that rarely gets noticed is the sheer size of these signs. An average interstate sign is around 17 feet wide by 11 feet tall. Considering a standard living room is 10 feet by 10 feet, that's a



*The average size of a cantilever base is around four feet in diameter, with a twenty-foot deep caisson foundation. The*

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pretty amazing fact! *diameter of the monotube (shown above) is two feet.*

Last but certainly not least, Interstate signs are now treated with a new microprismatic sheeting, providing much better night visibility for drivers. The new coating reduces the need for lights to be mounted on the signs, saving energy and reducing maintenance.

### **What the Project Involves**

The Ilex interchange is the first segment to be constructed as part of the New Pueblo Freeway.

The project consists of replacing bridges on I-25 between Ilex Street and City Center Drive in Pueblo. Work includes rehabilitation of bridges on northbound I-25 over Santa Fe Avenue (US 50C), I-25 over Indiana Avenue, on the Santa Fe Avenue (US 50C) bridge over the Arkansas River, and on Northern Avenue and Mesa Avenue over I-25.

Structurally deficient bridges on I-25 over Gruma Drive, the Union Pacific Railroad, and Ilex Street will also be removed and replaced.

Interchange ramps will be lengthened to provide safer transitions onto and off of the Interstate, especially the 1st Street ramp to southbound I-25. Roadway curves will be softened to improve visibility and provide a smoother ride for motorists.

Local roadway improvements are included at D Street, Ilex Street, Bennett Street cul-de-sac, Clark Street cul-de-sac, and along Santa Fe Avenue.

Bridges will be widened at City Center Drive and I-25 over Santa Fe Avenue (widened to the median).

### **I-25 Bridge Over Indiana Receives Finishing Touches**



The I-25 Bridge over Indiana Avenue recently received its initial coat of stain as one of the finishing touches on its rehabilitation.

First, the team pressure washed all surfaces with a 3000 psi pressure washer, and then allowed the concrete surface to adequately dry. Next, they used an airless sprayer to apply two coats of DOT sealer/stain to all concrete surfaces on the bridge.

### **Project Team Spotlight**

#### **Flatiron Field Engineer Sravan Karthikeya Shanmugam**

As a child growing up in India, Sravan Karthikeya Shanmugam never dreamed he would find himself in Pueblo, Colorado. Shanmugam joined Flatiron working on the I-25/Ilex Project Team in June 2017, after earning a Master of Science degree in Civil Engineering from the University of Colorado, Boulder.

According to Shanmugam, there are some notable differences between construction in India, versus the United States. Primarily, the construction industry in India is labor-intensive, due to the cheapness of labor there. Additionally, there is a larger amount of cast-in-place construction in India (built on-site) in contrast to more precast construction in the U.S. due to difficulty in

Noise abatement will also occur along some segments of I-25.

**Project Partners**

- Colorado Department of Transportation
- Federal Highway Administration
- City of Pueblo
- Pueblo County
- The Community

**Funding**

State of Colorado revenues from a safety fee placed on vehicle registrations have helped fund the Ilex Design-Build project.

***Funding sources for the project:***

Bridge Enterprise

RAMP (Responsible Acceleration of Maintenance and Partnerships)

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transportation.

One of the most notable differences between the countries to Shanmugam is how people here are given a tremendous amount of responsibility at a young age. "I was surprised to find the number of people in their early thirties managing multi-million dollar projects," he said.



"You wouldn't see that happen in India."

Perhaps the most important lesson he brought with him from India is teamwork. "India is a really diverse country, and even within the family - with so many different personalities - you are taught from a very young age to adjust and live with the people around you," said Shanmugam. "I feel is the basis of teamwork, that everyone needs to sacrifice and adjust for the team to succeed."

Although he hasn't been on the I-25/Ilex project team long, Shanmugam mentions the girder set for the new bridge over the Union Pacific Railroad as one of the highlights of the Ilex project so far. He eagerly awaits the demolition of the existing structure as the next highlight.

When Shanmugam is not hard at work on the I-25/Ilex Project, he enjoys playing and watching sports like tennis, soccer and cricket.

**November Photo of the Month Award Winner**



*Chris Hause with Empirical Environmental was the winner of the November photo contest with this photo of the primer application on the historic green truss bridge on Santa Fe Avenue (US 50C). Congratulations, Chris!*

### **Ilex Team Encourages Safe Winter Driving**

Did you know that motorists speeding and not paying attention are the main causes of work zone crashes? The I-25/Ilex project team suggests motorists follow these safe winter driving tips:

- Visit [www.cotrip.org](http://www.cotrip.org) before traveling to get current road conditions.
- Turn on your headlights and wear a seat belt.
- Turn off your cruise control.
- Stay in the lane behind the snowplow. The road behind a snowplow is safer to drive on. However, the plow driver's field of vision is severely restricted behind the truck; they must rely on mirrors to see to the rear and side of the truck. So, slow down and allow at least 10 car lengths between the vehicle and a snowplow.

- Watch for snowplows that turn or exit frequently, and often with little warning.
- Never drive into a snow cloud.
- Snowplows travel much slower than the posted speeds because its slower speeds are more effective for clearing roads. So, be patient and remember snowplows are working to improve road conditions.

Be patient with the snowplows and drive according to road conditions, while paying attention to traffic shifts and signage so everyone returns home safely. Everyone is in the storm together.

### Additional Project Information

For more information about the I-25 Ilex Design-Build project, visit the [CDOT website project page](#). To receive future Ilex Design-Build project e-newsletters and construction notices, send an email to [i25ilex@PublicInfoTeam.com](mailto:i25ilex@PublicInfoTeam.com) requesting to be added to the email list.

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