2021

# FHWA-Colorado Division and CDOT Stewardship and Oversight Agreement Annual Report

U.S. Department of Transportation
Federal Highway Administration

COLORADO
Department of Transportation

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## Section 1 Purpose

This report serves as the principal instrument by which the Colorado Department of Transportation (CDOT) informs the Federal Highway Administration (FHWA) of its performance across a number of mutually agreed upon indicators and measures associated with the administration of the Federal Aid Highway Program (FAHP). In 23 U.S.C. 106(g), Congress directs that the Secretary shall establish an oversight program to monitor the effective and efficient use of funds authorized to carry out the FAHP. This program includes FHWA oversight of the State's processes and management practices, including those involved in carrying out the approvals and related responsibilities assumed by the State under 23 U.S.C. 106(c). Congress defines that, at a minimum, the oversight program shall be responsive to all areas relating to financial integrity and project delivery.

The goal of this performance summary is to ensure that FHWA and CDOT are administering the FAHP in a cost-effective manner that maintains Colorado's national highway network, optimizes operations, improves safety, and provides for national security while protecting and preserving environmental resources.

Section 2 briefly introduces the various functional program areas, describes key activities accomplished in 2021, and provides tables summarizing CDOT's performance and compliance in each area. Performance/compliance measures, and their associated reporting frequencies and targets/baselines, were established in the May 2020 version of the FHWA-CDOT Stewardship and Oversight Agreement.

Section 3 describes risk response strategies that the CDOT and FHWA Quality Improvement Council (QIC) is currently focusing on and the status of recommendations in the implementation phase

# 2.1 ENGINEERING: CIVIL RIGHTS

## INTRODUCTION

**CDOT Manager:** Greg Diehl, Civil Rights Program Director; CRBRC  Kristi Graham-Gitkind, Chief Human Resources Officer; HR Anna Mariotti, Civil Rights Program Manager; CRBRC (Alternate)

**FHWA Manager:** Nicole Bumpers, Civil Rights Program Manager; FHWA Colorado Division

The Civil Rights Program is responsible for all activities in CDOT related to civil rights programs and requirements under state and federal law. Civil rights programs are an integral part of all aspects of CDOT's ongoing activities. The Civil Rights Stewardship Agreement is a Quality Control and Quality Assurance (QC & QA) approach, which relies on joint FHWA/CDOT team reviews of program activities to accomplish oversight of the program. The plan shifts federal oversight from a project-by-project basis to a program-level basis. Staff from CDOT's Civil Rights & Business Resource Center (CRBRC) and the Division of Human Resources work in partnership with each Regional Civil Rights Manager and with the FHWA Civil Rights Specialist to review, evaluate, and improve CDOT's Civil Rights Programs. The partnership between CDOT and FHWA continues to be an important part of ensuring compliance with the letter and spirit of laws and regulations.

## QUALITY/RESULTS

Statewide activities conducted to accomplish elements in Quality Section:

Disadvantaged Business Enterprise (DBE) Program

- Exceeded FFY 2021 Disadvantaged Business Enterprise (DBE) goal of 11.55% with 11.77% overall DBE participation.

- The DBE Specification used for highway construction projects is currently being updated to align processes for CDOT-advertised and Local Agency-advertised projects. This will also addclarity regarding DBE monitoring and oversight in an effort to increase compliance.

Emerging Small Business (ESB) Program

- To date, CDOT has leveraged the ESB Mentor-Protégé program to benefit:
  - 18 Teams
  - 36 Companies
  - 11 DBEs
  - 7 ESBs
  - 4 Protégés with prime contracts; $4M in total prime awards
  - 13 Protégés with subcontracts; $29.4M in total sub awards
  - $20.8M paid to Protégé firms

Outreach

- Hosted eight small business forums (four for professional services and four for construction) toincrease transparency in the CDOT process and improve communication on small business- related issues.

Contractor Compliance

- Continued piloting use of the B2GNow system on Local Agency Professional Services contracts and construction projects for increased accuracy in reporting. This pilot required an update informs as well as guidance documents to ensure consistency and it is anticipated that the Civil Rights compliance systems will be mandatory for projects and contracts that are advertised after July 1, 2022.Two task forces have been formed in an effort to more clearly outline compliance process rolesand responsibilities. One task force is focused

on the creation of process flowcharts for civil rights compliance elements on CDOT-advertised construction projects and professional servicescontracts. While the other is documenting the same information for Local Agency-advertised construction projects and professional services contracts. This assists in documenting both thesimilarities and differences or the compliance processes and will be utilized as a training tool as the systems become mandated for Local Agency projects and contracts in the future.

- Annual Construction Contractor Compliance Training Sessions have long been part of CRBRC'sservices; through virtual training in 2021, CDOT trained 455 individuals on Civil Rights compliance requirements across the state.

- Completed 18 Contractor Compliance Reviews.

On-The-Job Training (OJT) Program

- Achieved 106,007 On-the-Job Training (OJT) hours, which exceeded the goal of 50,000 hours.Of those hours, 37,000 are from seven (7) major projects.

OJT Supportive Services Program

- Continued to develop entry level construction training courses throughout the state; refineddata tracking procedures to better identify impacts and begin to scale programming to additional training providers.

Title VI

- The Title VI E-learning was launched in CDOT's Learning Management System as a requirementfor all CDOT staff. At the conclusion of FFY 2021, 93% of CDOT staff members had taken the training, which is one of the highest completion rates for a required training.

- CRBRC completed 10 subrecipient desk reviews for Title VI plans.

- For FFY2022, CRBRC developed a Title VI equity work plan with the FHWA Division Office CivilRights Manager to review Title VI contract language regulatory compliance within CDOT's agreements and contracts. CRBRC will meet with grant managers, review existing agreementsand contracts, and work with contract writers to implement required language in CDOT's templates. CRBRC will also begin compiling demographic data based on which local agencies have been awarded grants.

## PERFORMANCE MEASURES

The following performance measures demonstrate the health of the Civil Rights Program

Table - Performance/Compliance Measures (Civil Rights)

| PM # | Measure | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline | 2020 | 2021 |
|---|---|---|---|---|---|---|---|
| 107 | DBE participation (as percentage) todate on Federal Aid Highway Program | DBE Program | Transport | Federal FY | 11.55% | 11.66% | 11.77% |
| 459 | # of DBE firms receiving supportive services/benefits | DBE Supportive Services (DBE/SS) | Connect2DOT Program | Federal FY | 100 | 231 | 247 |

| PM # | Measure | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline | 2020 | 2021 |
|---|---|---|---|---|---|---|---|
| 313 | # of completed Contract Compliance Reviews | Contractor Compliance (External EEO) Program | Google Drive | Federal FY | 18 | 17 | 18 |
| 460 | # of OJT hours achieved | On the Job Training (OJT) Program | Google Drive/ LCPtracker | Federal FY | 50,000 hours | 75,480 hours | 106,007 hours |
| 461 | # of persons placed and employed (post-services) | OJT Supportive Services (OJT/SS) | Google Drive | Federal FY | 50 | None placed; 37 trained | None placed; 26trained |
| 310 | # of completed STA reviews | Title VI Program | Title VI Assessment | Federal FY | 6 | 1 | 10 |
| 1438 | Complete workplace culture reviews to support AAP and inclusive excellence strategy | EDI | Quarterly AA Report | Federal FY | 100% | 100% | 2/6 |
| 1439 | Gather EEO, sexual harassment, ADA, and all Title VII investigation outcomes data | EEO/AA | Quarterly AA Report | Federal FY | 100% | 100% | Aggregate data on discrimina -tion reports / findings gathered |
| Mination | Implement EDI training to support Governor's Executive Order D 2020175 | EDI | Quarterly AA Report | Federal FY | 75% | Start Jan 2020 | Started and Continuous |

## KEY LEARNINGS

A key learning opportunity will be to educate CDOT management and staff on CDOT's Civil Rights Programs and to distinguish the responsibility of external versus internal roles in achieving performance measure outcomes. The external program comprises Contract Compliance Programs external to CDOT managed by the CRBRC under the Division of Equity & Environmental Justice. The Equal Employment Opportunity Program has an internal focus on CDOT personnel policies and practices and will be managed by the Division of Human Resources.

Throughout the COVID-19 pandemic, the CRBRC has offered a variety of virtual training opportunities. CDOT also continued to host its quarterly Small Business Collaborative Forums for both the construction and professional services industries, although on digital platforms. Attendance increased as learning opportunities became available virtually. However, CDOT is faced with a new challenge: creating an engaging platform with interactive elements and on-demand content for attendees. One of the ways CDOT has been working to improve the virtual attendee experience is by trying different virtual meeting platforms and activities to increase networking activities and interactions.

Along with this effort, the CRBRC is developing training materials that align specifically with outlined roles and responsibilities for the project compliance team. This ensures the appropriate audiences receive targeted training information. The Civil Rights web pages on CDOT's external-facing website

will be restructured with increased user experience based on these target audiences.

**NEXT STEPS**

CRBRC plans to continue efforts focused on process flow charts for Civil Rights compliance elements to document roles and responsibilities which will result in increased consistency in monitoring and oversight. This will also assist in the implementation of the Civil Rights software systems (B2GNow and LCPtracker) for Local Agency highway projects that are advertised on or after July 1, 2022.

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## 2.2 CONSTRUCTION ENGINEERING SERVICES

### INTRODUCTION

**CDOT Manager CES:** Markos Atamo and Stephen Bokros (Alternate)

**FHWA Manager:** Edward Martinez

The functional group and assigned responsibilities for this section of the report are the Construction Engineering Services (CES) Group who prepares engineering cost estimates of construction projects prior to bidding in accordance with Federal rules and regulations, performs materially unbalanced bid, and prepares cost estimates for added work on active construction projects after their award.

### QUALITY/RESULTS

Overall Program Estimate Accuracy (EEMA):

- CY2021 Total Program Estimate (Design Bid Build projects): $648.1M
- CY2021 Total Program Award (Design Bid Build projects): $618.1M
- Accuracy: 4.63% of Engineer's Estimate

### PERFORMANCE MEASURES

The following performance measures demonstrate the health of the Construction Engineering Services Program:

Table - Performance/Compliance Measures (Contracts and Market Analysis)

| PM # | Measure | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline | 2020 | 2021 |
|---|---|---|---|---|---|---|---|
| 809 | Overall program estimate accuracy (EEMA) | Accuracy of total Program Estimate as compared to total Program Award on ALL Design-Bid-Build projects | CMA Branch Work Plan | Calendar Year | +/- 3% | 4.6% | 4.6% |
| 463 | Percent of projects awarded withinset percentage of Engineer's Estimate | Percent of awarded low bids within +/- 10% of Engineer's Estimate on ALL projects | CMA Branch Work Plans | Calendar Year | 50% | 45.5% | 50.4% |

### KEY LEARNINGS

### NEXT STEPS

CDOT is in the process of implementing a new estimation tool - AASHTOWare, to help improve the accuracies of estimates.

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## 2.3 ENGINEERING: HYDRAULICS

### INTRODUCTION

**CDOT Manager:** Alfred (Al) Gross

**FHWA Manager:** Spencer Tucker

The Hydraulic program addresses statewide issues involving design of hydraulics structures that include bridges, culverts, inlets, utility access holes, channels/ditches, and water quality basins. The program is responsible for working with the Regions to ensure that hydrologic and hydraulic design is implemented consistently according to CDOT Drainage Design Manual standards and criteria. The program is also responsible for creating and reviewing drainage/water related policy and procedural directives along with relevant and applicable standards and specifications.

### QUALITY/RESULTS

**Staff Branches Activities:**

1. Bridge Scour (Plan of Action) POA project. We scoped 29 structures but ended up working on 33 structures as the Big and Little Salt Washes structures were taken off shelf for a second time and readied for AD in 2022. The work involved preparing 21 scour designs and working on structures in approximately 8 projects. Construction support was done on two structures that were completed in construction. Item 113 re-coding memos were submitted for 5 structures that were taken off the Staff Bridge scour critical list. A yearly summary report for TO 13 was completed and sent to FHWA and Staff Bridge. A summary Regional breakdown of CDOT's scour critical projects and structures is as follows:

    - **Region 1**
        - Project #21222: SH 121, I-70, I-76, and SH 95 over Clear Creek with structures: E-16-O, E-16-P, E-16-KB, E-16-KB, E-16-KC, E-16-GS, E-16-PM, E-16-KD and retaining wall. Design progressed after temporary repair measures were implemented at Wadsworth SH 121 Bridge and along the on-ramp to I-76/I-70 retaining wall. Design included grade control, boulder sloping drop structures and pier protection. Ongoing coordination conducted with local governments Arvada, Wheat Ridge, and Mile High Flood District (MHFD). AD was expected late summer of 2021 but due to comments from MHFD it was decided we could not implement their recommendations for the scour countermeasures. Therefore, we went back to the drawing board to come up with a new local hydraulic scour countermeasure design. In addition, due to lack of funding, it was decided to cut back on the Scope and only complete hydraulic designs for 3 structures: E-16-GS, E-16-PM and retaining wall.
        - F-16-AV: 2-D Model was created, and hydraulic analysis completed. Finalized shelf level plans after coordinating with Region.
        - G-17-AL: Re-analyzed hydrology and hydraulics from 2012 POA. The 2-D model provided better representation of flow split in upper basin. It was determined that less flow is coming to the existing bridge and will overtop roadway to south. A memorandum was sent to Region and Staff Bridge outlining the findings. It is expected the structure will be replaced sometime in near future.
        - F-16-JP: 2-D model completed, and analysis done to determine if bridge was scour critical. After much discussion, it was decided structure was not scour critical and a memorandum with item 113 recoding memo was submitted to Staff Bridge.

    - **Region 2**
        - K-16-D: US 50 over Brush Hollow Creek. Completed hydrologic analysis, scour analysis, and finalized shelf level plans.
        - L-19-H: US 50 over Arkansas River. Completed hydrologic analysis, scour analysis, and

finalized shelf level plans.
    - L-26-H: US 50 over Arkansas River. Completed hydrologic analysis, scour analysis, and finalized shelf level plans.
    - P-17-A: #21591. SH 12 over Zaracillo Canyon. Project taken from shelf based on available funding for a new R2 project that packaged scour countermeasure work. Finalized the AD plans, specifications and floodplain permitting. Project went to AD July 2021.
    - K-16-Y: SH 115 over Oak Creek. Completed hydrologic analysis, 2-D model, and scour computations. Based on NCHRP abutment scour analysis results, structural stability analysis, and coordination with R2 it was determined structure was not scour critical and removed from the list.

- **Region 3**
    - H-02-GC: SH 340 WBND over Colorado River. Completed hydrologic analysis, scour analysis, and finalized shelf level plans.
    - F-05-R #24354: SH 13 over Colorado River. Region set up a project in 2021 and design moving forward. Region determined that due to lack of funding they wanted to install scour monitoring equipment on bridge. In process of coordinating that effort with Staff Bridge, R3 and RESENSYS company.
    - H-02-S: SH 340 EBND over the Colorado River. Completed hydrologic analysis, 2-D model and scour analysis and finalized shelf plans.
    - H-03-Z: I-70 over Lewis Wash. Completed hydrologic analysis, 2-D model, and scour computations. Based on updated hydrology, scour results, structural stability analysis it was recommended that the structure be removed from the scour critical list.
    - I-04-M: SH 65 over Gunnison River. Completed hydrologic analysis, 2-D model and scour analysis and finalized shelf plans.
    - H-02-FO/FP/FM/FN: I-70 over Big and Little Salt Washes. Coordination with R3 to address comments and redlines and to finalize AD level plans and specs. Anticipated to go to AD in May 2022.

- **Region 4**
    - D-15-A #22495: SH 7 N. St. Vrain Creek. Project taken from shelf based on available funding for a new R4 project that packaged scour countermeasure work. Finalized and coordinated with R4 Project consultant on the floodplain permit application, specifications, and drainage plans. Project went to AD November 2021.
    - D-15-AR/AX: US 36 over Boulder Creek. Completed hydrologic analysis, 2-D model, and scour computations. Shelf level plans to be completed in TO 14.

- **Region 5**
    - O-12-AD: SH 371 over Alamosa River. Completed hydrologic analysis, 2-D model and scour analysis and finalized shelf plans.
    - P-14-P: SH 142 over Rio Grande River. Completed hydrologic analysis, 2-D model and scour analysis and finalized shelf plans.
    - P-01-G #20685: US 160 over San Juan River. R5 requested to re-analyze hydrology, 2D model, scour computations, foundation stability assessment and the scour countermeasure design. Design is progressing and project is moving ahead.
    - N-11-V: SH 112 over Rio Grande. Completed hydrologic analysis, 2-D model, and scour computations. Based on updated hydrology, NCHRP abutment scour analysis results and structural stability analysis it was recommended that the structure be removed from the scour critical list
    - P-13-D: SH 142 over San Antonio. Completed hydrologic analysis, 2-D model, and scour computations. Based on updated hydrology, NCHRP abutment scour analysis results and structural stability analysis it was recommended that the structure be removed from the scour critical list.

2. Supported the Transportation Engineering Training Program (TETP) – Transportation Core Curriculum for the annual Hydraulic presentation. However, the conference for 2021 was cancelled due to COVID 19. R3 Hydraulic Engineer Stuart Gardner is still interested in participating in 2022.

In addition, John Ewy the new Hydraulic RE in R1, is scheduled to participate in the 2022 class.

3. Supported the Environmental Programs Branch by participating in various committees and meetings. Committees included Water Quality Advisory Committee (WQAC) and the Permanent Water Quality Mitigation Pool Fund Committee. Attended meetings and reviewed documents for development of the new permanent water quality operation and manual template. Project Development (Neil Lacey and I) worked closely with the Environmental Permanent Water Quality group - Rachel Hansgen and Jeremiah Unger on the Pond Information Certification (PIC) language and form. We also implemented a pilot program and hired a consultant to perform the PIC's that continued for the 2021 year. Consultant tasks included reviewing water quality reports and as-built survey models for an estimated 30 water quality ponds statewide. As of the end of 2021, our consultant had reviewed six permanent water quality ponds in R1, one pond in R4 and two ponds in R2 along with a Maintenance facility. Ultimately, the PIC form will be completed by the CDOT Regional Hydraulic Engineers (RHE's) statewide. This will require them to review the pond information and PE sign and seal the PIC form stating the permanent water quality facility (e.g., extended detention basin) was in reasonable conformance to the design and constructed according to plan

4. Supported the Specifications and Standards Unit – Worked on several drainage related standards and specifications details. Worked with the Materials Branch (Ed Trujillo) in reviewing new drainage related products that have been requested to go on the CDOT Approved Products List. Also, continued to work with Materials & Geotechnical branch to address a request from ADS Drainage Company to revise some of our culvert specifications and drainage details for plastic pipe. In addition, we are looking at a request from ADS pipe concerning the number of plastic pipes on CDOT projects in relation to all other pipe materials.

5. Supported the Applied Research and Innovation Branch. Attended meetings and reviewed documents and materials for several water/drainage related research projects. The research projects in 2021 included: Post-Wildfire Peak Flow Data Collection and Modeling in Burn Scar Areas by USGS and Assessment of Post-Wild-Fire Debris Flow Hazard to Transportation Infrastructure in Colorado by CSU and R4 Hydraulics. We are evaluating whether or not to extend Eastern Colorado Crest Stage Network research project by USGS.

6. Participated in an NCHRP pilot study for Applying Climate Change Information to Hydrologic and Coastal Design of Transportation Infrastructure research project with Dewberry consultant. Our scour consultants, RESPEC and Hydrau-Tech, helped with the work. We completed monthly surveys, a final workshop with the other participating DOTs and a presentation at CASFM. Presentation to Staff Bridge will be conducted in 2022. Dewberry has approached us on another research pilot study called FloodCast involving flood forecasting which we have agreed to participate in.

7. Championed and supported FHWA's Every Day Counts (EDC-5) and Collaborative Hydraulics Advancing to the Next Generation of Engineering C.H.A.N.G.E. program. Strongly encouraged Regions and their consultants to use 2D modeling on all culvert and bridge projects. Consultants for the Bridge Scour POA project are using 2-D modeling on all of our scour countermeasure designs and projects. Staff Hydraulics, several of the Regions and our scour consultants participate regularly in FHWA's 2-D Hydraulic Modeling Users Forum webinar.

8. Supported and co-championed the team that researched and tested the 2dQC process which included Kalli Wegren (EIT III R4), Brian Varrella (Resident Engineer R4), Brian Campbell (Hydraulic Engineer R5), six (6) consultants, and Region 5 staff. Consultants were selected from NPS contracts and include AECOM, Ayres, Jacobs, Muller, RESPEC, and RS&H. Through in-house and consultant support, the initiative is on track to complete (54) 2dQC projects statewide by the end of the year and develop a process to identify 2dQC opportunities in the future. Innovations and recommendations received thus far include but are not limited to modified site plans in the right-of-way, riprap reductions, level of service management, clear zone grading and safety

improvements, and safety signage.

Nine projects currently completed in-house identified potential project enhancements that totaled $977,640 in cost savings. About 400 hours were devoted to the 9 projects, which gives us a return-on-investment ratio of 40:1. In addition to cost savings, design and safety enhancement recommendations further protect the traveling public along CDOT roadways. CDOT Leadership hopes the 2dQC effort can fundamentally transform in-house capabilities and expertise and allow CDOT employees and partnering consultants to deliver projects that are safer, more cost effective, and enhance the resiliency of publicly funded infrastructure projects delivered in Colorado. Note: Above information was provided by Kalli Wegren in R4.

9. Miscellaneous – worked with Staff construction to develop articles for the quarterly newsletter. Produced articles on topics including scour, stormwater, and 2-D Quick Checks. Responded to internal and outside agency requests for water quality and hydrologic/hydraulic information. Met with vendors and set up internal meeting with hydraulic staff and others for various drainage related products. Participated on the Risk and Resiliency Working group; attended meetings, participated in workshops, and reviewed reports.

**Region Activities:**

1. The CDOT Annual Hydraulic Meeting was held virtually in April & October 2021. There were half day meetings that centered around discussion topics by Region Hydraulic Engineers (RHE's) followed by round table discussions based on an agenda of topics ranging from hydrology and hydraulics to various specific Region issues or concerns.

2. Office of Employee Development (OED) offered to sponsor a training class in 2021 but there were no classes offered remotely that were of interest. In addition, it did not make sense to sponsor a class physically at CDOT Headquarters as we cannot provide enough participants. Steve Griffin in R4 and Brian Campbell in R5 conducted several lunch and learn sessions on Watershed Modeling Systems (WMS) and Lidar.

3. CDOT Project Support (Neil Lacey) continued to sponsor in 2021 a corporate membership ($400) for the Colorado Association of Stormwater and Floodplain Managers (CASFM). CDOT has approximately 35-40 members statewide from Hydraulics, Environmental and other specialty groups.

## PERFORMANCE MEASURES

The following performance measures demonstrate the heath of the Hydraulics Programs:

**Table - Performance/Compliance Measures (Hydraulics)**

| PM# | Measure | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline | 2020 | 2021 |
|---|---|---|---|---|---|---|---|
| 1441 | Update of the Scour Designs going to Construction for all Scour Critical Bridges | The percentage of scour critical on-system bridges worked on (NBI Item 113 Code: 2, 3 or U) in current year that went to AD or construction or after additional scour analysis were taken off list by re-coding Item113. | Consultant management reports | State FY | 30% | 26.7% | 31% |

**KEY LEARNINGS**

1. Some of the RHE's voiced concerns that they cannot get approval to attend various workshops or conferences. The MHFD annual seminar and the CASFM conference are the two most important water related events to attend each year. A few of the RHE's are attending but many are paying for these expenses themselves. This was not an issue in 2021 due to COVID-19. Most workshops and conferences were either cancelled or held remotely.

2. Through interaction and discussion with the RHE's on the PIC language topic it was recommended that they should attend the various water quality meetings and participate in discussions.

**NEXT STEPS**

1. At the advice of Staff Bridge, the Staff Hydraulics and consultants set up a new invoice system to better track costs associated with Bridge Scour POA project for scour critical bridges. Consultants will be finishing billing cycle in January, and I will present to Staff Bridge Management on the budget tracking system early in 2022. In addition, the consultant prepared a Summary document of the work completed in TO 13.

2. Continued to work with Staff Bridge addressing culvert repairs statewide. Staff Bridge continues to collect and prepare information for culvert repairs statewide including drainage area, hydrology, and hydraulic information.

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## 2.4 ENGINEERING: PAVEMENT AND MATERIALS

**INTRODUCTION**

**CDOT Manager:** Craig Wieden and Laura Conroy (Alternate)

**FHWA Manager:** Brian Dobling

The Materials and Geotechnical Services Branch is responsible for ensuring quality in the products used for construction of the State transportation system. The Branch is responsible for the specifications, test procedures, and associated testing of materials to ensure compliance with CDOT standards and specifications and FHWA Regulations. The Materials and Geotechnical Services Branchincludes Programs in the following areas: Soils/Geotechnical, Geohazards, Concrete and Physical Properties, Asphalt Pavements, Pavement Management, and Pavement Design. Due to the COVID Pandemic and restrictions that were put in place on in-person training and/or number of training attendees, some modifications to our typical processes were required. Updates below reflect those modifications where appropriate.

**QUALITY/RESULTS**

1. The CDOT Soils and Geotechnical Program conducted 37 Western Alliance for Quality Transportation Construction (WAQTC) certification classes. This included certificationsessions in Durango to provide service to Western Slope personnel.

2. Through partnerships with industry (Colorado Asphalt Pavement Association [CAPA], American Concrete Pavement Association [ACPA], Colorado Ready Mixed Concrete Association [CRMCA], etc.), CDOT hosted numerous ACI certification courses and Concrete Paving Inspector courses atour Central Lab location and provided certified proctors for various LabCAT certifications coursesover the year. 48 American Concrete Institute (ACI) certification/training courses were offered,with the majority of those consisting of both morning and afternoon sessions due to COVID attendance restrictions. Five Concrete Paving Inspector classes were offered via the Colorado Ready Mixed Concrete Association and American Concrete Pavement Association. 27 LabCAT certification courses, 11 Asphalt Inspector certification courses, and 5 Introduction to PC/OA courses were offered via the Rocky Mountain Asphalt Education Center (RMAEC). Three meetingsof the LabCAT Board of Directors were also held, as were two meetings of the WAQTC Board of Directors to review and discuss the Programs. A proposed fee increase of $25/certification wasapproved by the LabCAT BOD which is intended to be used primarily for equipment maintenanceand upgrades, as well as purchase of new equipment to support emerging technologies.

3. Two manuals were updated and improved over the course of the year. They included the Field Materials Manual (FMM), and the CDOT Laboratory Manual of Test Procedures. In addition, an addendum to the Pavement Design Manual was issued, to be used as a supplement to the existing Pavement Design Manual. FMM improvements included an update to each chapter for Documentation when using SMM/LIMS and language on the use of the Adobe Sign Form 473/474, updates to the Documentation for Design-Build Projects, and updates to the Special Notice to Contractors, OA Frequency Guide Schedules, and IA Schedule.

4. The Materials Advisory Committee met six times to identify, discuss, and resolve Materialsrelated issues. Notable improvements include:
   - Updates to the M&S Standards M-603 specifically for Plastic Pipe. Proposed changes to theM-standards were reviewed by the MAC over the course of several meetings and were approved to go to the PDAC. Revision to the M&S M412 Standards.
   - Approved a new Class of Concrete to be used specifically for dry-cast precast box culverts.
   - Approved a revision to Section 412 of our specifications as well as M-standard plans forconcrete pavement repair.

- Approved updates to the specifications related to increased joint density values. These updates affected Sections 105, 106, and 401 of the specifications and will be piloted on two projects per Region for 2022.

5. The CDOT, Arizona Department of Transportation, New Mexico Department of TransportationUtah Department of Transportation Four Corners peer exchange meeting was not held in person in 2020, but we were able to hold a series of remote meetings to discuss topics of concern/interest with our adjacent State counterparts. While productive, we intend to try and bring back the in-person meetings as soon as possible.

6. The Central Laboratory maintained 86 tests in the American Association of State Highwayand Transportation Officials (AASHTO) Accreditation Program (AAP). The Central Laboratory quality review of each of the five Region Laboratories and remote testing facilities was conducted and reporting completed in June 2021. The 2020 inspection consisted of in-person reviews of each Region lab and equipment, as well as paperwork reviews and round robin testing/review.

7. The testing reports for the round-robin proficiency program with the Regions, consultants,and contractors were completed for asphalt, concrete compressive strength, aggregates, sulfates in soil, and soils materials.

8. The Pavement Management Technical Committee met six times during the year. Improvements made to the Pavement Management system are documented in the Technical Committee meeting minutes. The FY 25 planned SUR projects were finalized. In an effort to address interstate pavement condition related to the Federal Performance Measures, the HQ PavementManagement Program has begun to generate 1/10$^{th}$ mile reports using the Federal criteria on the raw data collected. This information is reviewed with the Region SUR Asset/Pavement Managers, and areas of concern are identified. This led to the identification and planned project to consist of diamond grinding 24 miles of I-76 in Region 4 to help address pavement conditions.

9. The Geohazards Program continued to provide support and response around the state to address Geohazards. The 2020 Grizzly Creek Fire burn area through Glenwood Canyon received much attention by the Program due to the debris flows that began to occur withColorado's monsoon season.

10. Partnering with Industry: The CDOT/American Concrete Paving Association (ACPA) Coop met four times to identify and resolve issues. CAPA and CDOT brought back the Asphalt Industry Forum Meetings in the fall of 2021 to discuss relevant topics. One meeting was held and primarily focused on Pavement Smoothness and the guidance provided for assigning PavementSmoothness Categories on projects. These discussions will continue into 2022. Work continued on task force topics related to Concrete Pavement Repairs and updates to the Concrete Pavement M&S Standards. The Colorado Ready Mixed Concrete Association and the Concrete & Physical Properties Program meet bi-monthly to discuss specification changes and administration of the ACI certifications. Industry partnerships generate and refine the finishedimplemented improvements that are listed under MAC accomplishments in item 4 above.

11. The use of CP-59 to document and approve WMA technologies and contractors continued in 2021. The total number of approved Warm Mix Asphalt (WMA) technologies stands at 12 andcontractors at 12. Many contractors are approved for multiple WMA technologies.

12. LIMS (Laboratory Information Management System) - LIMS Support/Training continues through CDOT's 's Technology and Data Services, Engineering Software support group. A representativeof this group continues to attend MAC meetings to provide updates. An effort led by the same group to evaluate engineering software systems has concluded. Our next LIMS system will be provided by Atser. Efforts related to the development of this program are underway with Materials Personnel involvement. CDOT's Materials Technician Certification continued through 2021 as an e-learning course through our Transportation Engineering Training Program (TETP). This e-learning

certificationprovides Materials Technicians an overview of what is expected from them as a Materials Technician on CDOT projects, including processes and resources, communication protocols/expectations, documentation requirements, and provides an overview/refresher of SMM/LIMS. CDOT continues to work on improvements to our Buy America documentation requirements as well as efforts to update our pre-qualification requirements for Pre-Cast Manufacturers as detailed in CP-11. Updates to our processes will continue into 2022 through coordination with the Colorado Contractors Association as well as pre-cast product manufacturers.

13. The Product Evaluation Program continues to implement changes and improvements to betterthe process used for approval of products.

14. The Concrete/Physical Properties Program, continued programs for certifying Pavement Smoothness Testing Devices, and certification of Pavement Smoothness Operators in 2021.

## PERFORMANCE MEASURES

The following performance measures demonstrate the health of the Pavement andMaterials Program:

Table - Performance/ Compliance Measures (Pavements and Materials)

| PM # | Measure | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline | 2019 | 2020[1] |
|---|---|---|---|---|---|---|---|
| 811 | Percentage of pavements of the Interstate System in good condition | Percent of all Interstate pavement segments rated good under the criteria set by 23 CFR 490 | Highway Performance Monitoring System (HPMS) | State FY | National Performance Measure Targets: 2020: 46% 2022: 40% | 46.5% | 46.3% |
| 812 | Percentage of pavements of the Interstate System in poor condition | Percent of all Interstate pavement segments rated poor under the criteria set by 23 CFR 490 | Highway Performance Monitoring System (HPMS) | State FY | National Performance Measure Targets: 2020: 1% 2022: 5% | 2.7% | 3.9% |
| 813 | Percentage of pavements of the non- Interstate NHS System in good condition | Percent of all non- Interstate NHS pavement segments rated good under the criteria set by 23 CFR 490 | Highway Performance Monitoring System (HPMS) | State FY | National Performance Measure Targets: 2020: 50% 2022: 40% | 41.5% | 41.7% |
| 814 | Percentage of pavements of the non- Interstate NHS System in poor condition | Percent of all non- Interstate NHS pavement segments rated poor under the criteria set by 23 CFR 490 | Highway Performance Monitoring System (HPMS) | State FY | National Performance Measure Targets: 2020: 1% 2022: 5% | 3.1% | 3.3% |

[1]Data for the reporting year 2021 is not available until June 15th after the close of the reporting year.Therefore, data from 2020 is reported.

## KEY LEARNINGS

CDOT Materials, in conjunction with the Construction Area Engineers, revised Section 106.11 of our Standard Specifications to better clarify Buy America documentation and requirements. This revision was made to clarify that documentation received is capable of allowing CDOT personnel to track the steel/iron used on projects back to the original point of smelting or melting through continued reference/tracing of mill test report/heat number.

Improvements to CDOT's Longitudinal Joint Density Specification – worked with industry to raise the lower limit of our longitudinal HMA joint density requirements.

**NEXT STEPS**

Efforts continued to revise/improve our pre-qualification of manufacturers of pre-cast concrete projects. We continue to work with manufacturers on the proposed changes. The concern and continued goal is to ensure compliance with Federal Buy America requirements to the satisfaction of the FHWA Personnel, without causing additional undue burden on CDOT's Field Construction Staff. During the course of the rewrite, we also have included additional requirements for the Precast Manufacturers to follow/include in the Quality Systems Manual that is submitted for the pre-qualification process.

Asphalt Cement Cost Adjustment – Continue to monitor the index trends and associated payments with the new specification to track the benefit to CDOT as well as those projects now bid that opt in or out of the AC adjustment specification.

Buy America – Continue work on Buy America training. Currently we are working on a module to be delivered through CDOT's Learning Management System that is intended to help CDOT personnel, Local Agency Personnel, as well as Contractors to better identify if the Buy America Paperwork being received is sufficient to satisfy our specifications.
Pre-Qualification of Pre-cast Manufacturers (CP-11) – Continue to work with manufacturers on the proposed changes to CP-11.

Design Bulletin for Alternate Bidding Best Practices – Continue to work on a document intended to provide Best Practices for CDOT Designers when assembling Alternate Bid Plans/documents. Current information on Alternate Bidding is contained within the Pavement Design Manual but focuses on the LCCA aspect and decision on when to Alternate Bid a project. The Best Practices Documents will go from that point into providing recommended practices to minimize design effort, as well as to capture the needed nuances and specifications for an alternate bid project.

Implementation of a process/specification to begin collecting Environmental Product Declarations (EPD's) for eligible construction materials in support of HB 21-1303. This bill requires that CDOT begin collecting EPD's on projects advertised after July 1, 2022.
Efforts are underway in support of this Bill.

Continued work on implementation of Balanced Mix Designs for HMA. A joint CDOT/Industry working group continues discussions on implementation and movement towards this effort.

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# 2.5 ENGINEERING: DESIGN AND CONSTRUCTION

## INTRODUCTION

**CDOT Manager:** Neil Lacey (Design) and Markos Atamo (Construction)

**FHWA Manager:** Shaun Cutting

The Design Program Manager and Construction Area Engineers are responsible for assisting the five CDOT Regions to maintain uniform administration and management practices in construction, design and contract administration. In addition, they are responsible for providing technical assistance to the Regions and various local agencies.

## QUALITY/ RESULTS

1. There were 198 Change Orders submitted in FY2021. Of those 198, 182 (92%) werecomplete as submitted, 16 (8%) needed revision, and 0 (0%) needed supplemental documentation. There were 6 Major Change Orders requiring FHWA approval.

2. The Liquidated Damages table was revised this fiscal year and in place for FY 2022-23. Thenext revision is scheduled for review in FY 2024, revised bi-annually.

3. There was one claim filed in FY 2021. Typically, claims are filed only after the disputeresolution process is exhausted. This year two claims went straight to claim status.

| Status of FY21 Claims | | < $250,000 | >$250,000 |
|---|---|---|---|
| Claims Open Beginning FY21 | 5* | 0 | 3 |
| New Claims FY21 | 1 | 1 | 0 |
| Claims Resolved FY21 | 1 | 0 | 1 |
| Claims Carrying Over FY22 | 5* | 1 | 3 |

*claims of undetermined amount

4. Dispute Status FY 2021

| Status of FY21 Disputes | | < $250,000 | >$250,000 |
|---|---|---|---|
| Disputes Open Beginning FY 21 | 3* | 0 | 2 |
| New Disputes FY21 | 3 | 2 | 1 |
| Disputes Resolved FY21 | 1 | 1 | 0 |
| Disputes Carrying Over FY22 | 4 | 1 | 3 |

*dispute of undetermined amount

5. Four Joint CDOT/ Colorado Contractors Association (CCA) Specifications Committee meetings were held, and sixty standard specifications were issued. There were twenty Findings in Public Interest (FIPI) posted
   - Field Materials Manual issued
   - CDOT M-E Pavement Design Manual issued
   - Laboratory Manual of Test Procedures with revisions issued
   - Safety Selection Guide for Crash Cushions, End Treatments, and Barrier Guide issue Three

Inter-Regional Reviews were performed for FY 2021. No Post ConstructionReviews were performed this year.

6. The Area Engineers and FHWA Area Engineers conducted Residency Visits with all of theregional design/construction residencies and traffic units.

7. Four Area Engineer/FHWA Program Delivery Team Leader meetings were held in FY 2021.

8. The Project Development and/or Contracts and Market Analysis Branches were representedat the following committee meetings:
    - CDOT/CCA Specifications Committee - 4 of 4 meetings
    - CDOT/ American Concrete Pavement Association (ACPA) Coop - 4 of 4 meetings
    - CDOT/ Colorado Asphalt Pavement Association (CAPA) Coop - 4 of 4 meetings
    - Project Development Advisory Committee (PDAC) - 4 of 4 meetings
    - Materials Advisory Committee (MAC) - 6 of 6 meetings
    - Local Agency Roundtable Team (LART) - 4 of 4 meetings
    - Resident Engineer Committee – 6 of 6 Meetings including the Annual PE II Meeting.
    - Water Quality Advisory Committee – 4 of 4 Meetings

9. Ten construction projects and one maintenance project traffic control reviews wereconducted in FY 21, of which two were nighttime reviews. Statewide average construction and maintenance project scores were 92.6% and 96.0%, respectively. The final report was submitted to FHWA on December 17, 2020.
10. Five Construction Bulletins, three Design Bulletins and one Local Agency Bulletin wasissued.
11. The TETP conducted training courses in numerous subject areas (number of classes held): Alternative Delivery: Introduction to the Major Types of Project Delivery at CDOT VILT (9), Alternative Delivery: RFQ/RFP Evaluation (2), Construction Project Administration (1), CPM Scheduling for Construction (2), Design Build: Develop Request for Proposal (2), Design Build: Executive Summary/Design Build 101 (4), Disputes and Claims Resolution (3), Lighting Design Guide (2), Managing Contract Time (1), Negotiations (2 - *Newly Developed), Project First Program (6), Writing for Engineering Professionals (3). Thirty- Seven (37) virtual instructor-led TETP courses were held in FY 2021. Zero (0) in-person instructor-led TETP courses were held in FY 2021 (including the Transportation Core Curriculum). In addition to the virtual training courses there were the following e-learning courses available:
    - Construction Budget Management for Project Managers & Engineers,
    - Construction Change Orders,
    - Construction Force Accounts,
    - Construction Manual: Section 100,
    - Construction Project Financials,
    - CPM Scheduling: MS Project 2013,
    - Guardrail Systems for Construction Engineers and Inspectors,
    - Managing Contract Time,
    - Plan Checking,
    - Project Development Manual,
    - Negotiation Fundamentals eLearning,
    - Project Lifecycle Simulation,SAP Project Portal,
    - Specifications Writing and Development,
    - Survey Basics for Engineers, and
    - Work Hour Estimation: Scope of Work.

Due to the ongoing COVID-19 pandemic, TETP did not schedule: Transportation Core Curriculum, Applied Roadway Design, Construction Project Administration for Local Agencies, Interchange Planning and Design, & Reading Structural Plans.

**PERFORMANCE MEASURES**

The following performance measures demonstrate the health of the Design and Construction Programs:

Table 1 - Performance/ Compliance Indicators (Design and Construction)

| SAP # | Indicator | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline | 2021 Actual |
|---|---|---|---|---|---|---|
| 328 | Number of change orders approved byCDOT | Number of change orders which did not require FHWA approval | CDOT Work Plan | State FY Quarterly reporting | Track trend | 192 |
| 345 | Time to close a project from final acceptance to project closure in (Fiscal Management Information System (FMIS) | Average # of days to close a project | CDOT Work Plan | State FY Quarterly reporting | 200 days | 321 days |

Note additional prior year actuals are:

- 2020: 280
- 2019: 394
- 2018: 415
- 2017: 443
- 2016: 374
- 2015: 278
- 2014: 314

## KEY LEARNINGS

CDOT determined that landscape establishment is a major factor for the delay in project closure, SAP #345. We are continuing to work on process improvements in this regard. The goal is to have 95% of projects closed and de-budgeted within 12 months of project acceptance.

## NEXT STEPS

Resolve any disputes within the projects as timely as possible. Continue to teach and support the development of engineering training courses in order to support consistency and maintain knowledge throughout our design and construction staff.

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## 2.6 ENGINEERING: PROGRAM AND PROJECT DELIVERY – PROGRAM Reporting and Transparency

**INTRODUCTION**

**CDOT Manager:** Hilary Hawthorne and Brian Metzger (Alternate)

**FHWA Manager:** Elizabeth (Liz) Cramer

**QUALITY/ RESULTS**

In CY 21 PMO transitioned to a new role, Program Reporting and Transparency Office (PRTO). PRTO will continue to support consistent, and best, Project Management practices across CDOT. but the office's primary focus is to provide transparency to our capital construction program.
PRTO tracks program delivery metrics at the statewide level such as on time project delivery and the Expenditure Performance Index (XPI) and reports the results of data analysis and data trending to the Regions for review and actions, if needed. The PRTO is continually working to determine the best metrics to guide decision making for program management. We are improving project management tools, gathering data, and working on the best methods for reporting outcomes.

PRTO is leading the initiatives described in the table below.

Table – PMO Initiatives

| Initiative | Description | Status | Benefits |
|---|---|---|---|
| Reporting | Continued development of Visual, easy-to-read reports that instantly aggregate and organize key program and project management data and metrics. Coordination with other CDOT teams to standardize reporting and make it more efficient, with afocus on helping CDOT communicate with our stakeholders. | Updated Monthly and new Dashboards and views are added and modified as needed. Participate with EDMAC and TUG to work towards consistency in reporting across CDOT. | • Provides access to consolidated data in an easily accessible and understandable manner<br>• Track project and program progress<br>• Develop new reports for new funding<br>• Develop new reports to improve communication with our stakeholders. |
| PMWeb System Production Support and Training (Formerly OnTrack) | Project information system to support program and project management lifecycle, including multiple levels of CDOT stakeholders across functions, Regions, headquarters, and partner organizations (e.g., FHWA). | First release of PMWeb records and functionality is available. Development will continue. Training and adoption are ongoing. | • User friendly, one-stop shop for all project information, including progress tracking, workflows, approvals, notifications, and more<br>• Supports efforts to group and aggregate projects, identify program needs, prioritize projects and distribute funds<br>• Provides access to easy-to-use metrics-based dashboards<br>• Data from across the program and project lifecycle can be used to forecast<br>• Increases efficiency of process workflows, collaboration, and data entry |
| Project Management Guidance for Preconstruction | Processes, guidance, tools, andrequirements for project managers that are standardized across CDOT. Teaming with PMWeb and Project Delivery to ensure guidance is updated, consistent and available in one virtual location. | Update of the Project Development manual has been initiated. | • Establishes standardized, consistent approach for managing projects across Regions<br>• Ensures accurate and consistent project data is maintained in PMWeb, critical to supporting accurate progress reporting and aggregating project data in dashboards |

| Initiative | Description | Status | Benefits |
|---|---|---|---|
| Project Management Tools Develop, Maintain, and Train | PRTO maintains 4 tools and is developing/refining 2 others.<br>• Project Cost Planner Tool<br>• Change Order PriceAnalysis Tool<br>• CM Staffing tool<br>• Work Hour Estimation<br>Construction Duration tool<br>Project management website | • Work Hour Estimation (under development)<br>• Construction Duration tool (being refined)<br>• Project management website (being updated) | • Establishes standardized, consistent approachfor managing projects across Regions<br>• Encourages PMs to utilize consistent processes for estimating cost and work hoursin projects. |

## PERFORMANCE MEASURES

The following performance measures demonstrate the health of the Program Management Program.

Table - Program Management Performance/ Compliance Measures

| PM # | Indicator | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline | 2020 | 2021 |
|---|---|---|---|---|---|---|---|
| 555 | Expenditure Performance Index (XPI) | XPI is actual program expenditures divided by annual target[1] for program expenditures. | Reported to PMO Governance | Monthly | 0.95≤XPI ≤1.05 | 0.92 | 0.88 |
| 1442 | % Projects advertised by baseline Late AD date | Projects must be advertised by the Late AD Date set at the FIR milestone, in order to achieve planned construction expenditures for the CY | Reported to PMO Governance | Monthly | 95% | 76% | 93% |
| 1443 | % Projects closed on-time | Percent of projects closed and de-budgeted within 12 months of final acceptance | Reported to PRTO Governance | Monthly | 95% | 82% | 83% |

[1]The CY21 annual target reflects planned expenditures as of 01/2021.

## KEY LEARNINGS

1. XPI achieved in 2021 was 88 percent, with total expenditures of $694 million comparedto a target of $784 million, or 7 percent lower than the desired range or 95%-105%.

2. Of the 292 projects that had construction expenditures in 2021 9 were considered regionally significant (budget>$100M). Those 9 (3% of total projects) contributed 27% ofthe shortfall in construction spending as discussed in point #1 above.

3. Of the 98 projects advertised, six were advertised after their Late AD. The late AD did not affect the project's spending for the construction season. We are continuing to see improvement with advertising projects on time and we are optimistic that the implementation of PMWeb will support this progress.

4. PRTO worked with our region partners to create a better dashboard to communicate the duration and step of a project in the closure process. This allowed PRTO to help teams prioritize projects for closure as dates where approaching. A careful analysis of the closure process also allowed PRTO to help regions determine when a project was atrisk of missing the

1-year deadline. PRTO intends to continue to the communication of risk projects throughout the next year.

**NEXT STEPS**

PRTO will be working with the regions to migrate projects, and project management into the PMWeb system. We expect that reporting will need to be refined as we use the new data source.

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## 2.7 ENGINEERING: RIGHT OF WAY

**INTRODUCTION**

**CDOT Manager:** Christine Rees and Brian Cesarotti (Alternate)

**FHWA Manager:** Jeff Bellen

A host of state and federal rules and regulations governs the acquisition of private real property for public use. The Right of Way (ROW) Program has overall responsibility for the acquisition of real property on Federal Aid projects. This responsibility includes assuring that acquisition and relocation activities are conducted in compliance with Federal and State legal requirements.

The ROW program is part of the CDOT Project Development Branch. The right of way phase of the project development process can be divided into four process categories or work activities:

- Survey
- Valuation (Appraisals/Review and Waiver Valuations)
- Acquisition
- Relocation

**QUALITY/RESULTS**

1. All of the required actions on the FHWA ROW Required Actions List assigned to ROW were completed for fiscal year 2021.

2. CDOT's ROW Manual is updated every 5 years. A complete 5-year update to the ROW Manual was approved by FHWA on March 9, 2021 and put into effect by CDOT on April 1, 2021.

3. There were no requests for waivers.

4. In accordance with the Statistical Report requirement in 49 CFR Part 24 Appendix B, CDOT submitted the required annual statistical report to FHWA on November 13, 2021.

5. To better understand the data, a baseline of the number of Federal Aid projects with ROW is useful and shown below.

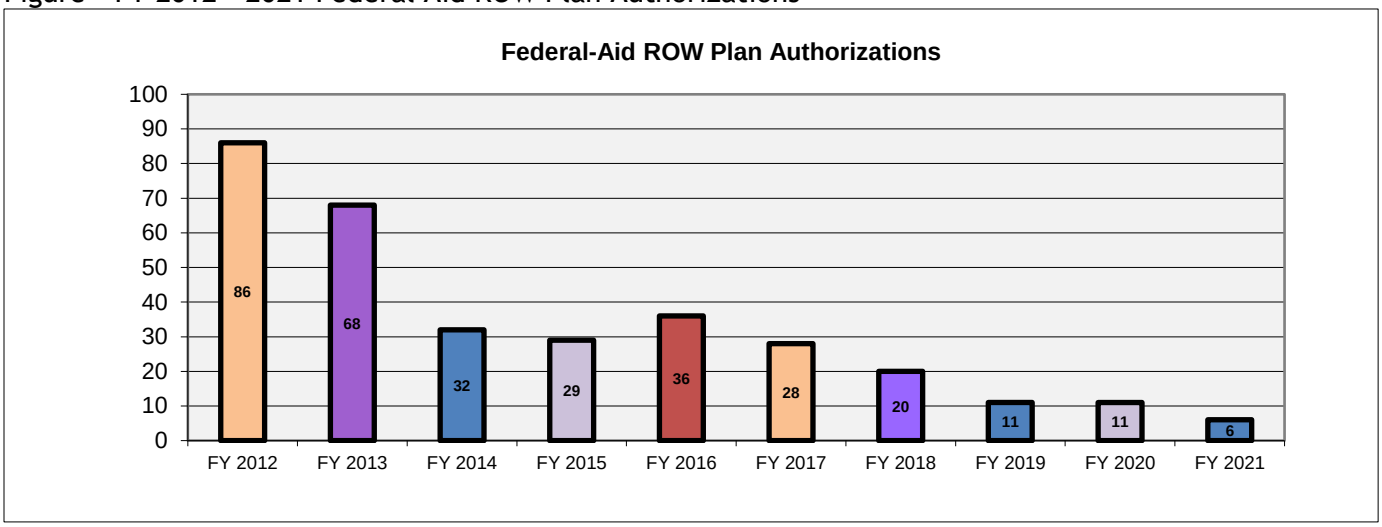
Table - FY 2012-2021 CDOT Authorized ROW Plans for Federal Aid Projects

| ROW Plans Authorized | FY 2012 | FY 2013 | FY 2014 | FY 2015 | FY 2016 | FY 2017 | FY 2018 | FY 2019 | FY 2020 | FY 2021 | 10 Year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Federal Aid Projects with ROW | 86 | 68 | 32 | 29 | 36 | 28 | 20 | 11 | 11 | 6 | 32.7 |

6. Ongoing monitoring regarding Uniform Act-based processes was performed on every project for which federal participation was sought. All required forms were fully completed, and three or more levels of review were done on each acquisition and relocation prior to issuance of any funds. HQ ROW and Region staff adapted to the pandemic and associated work-from-home requirements with electronic signature processes for internal authorizations.

7. CDOT authorized 6 ROW Plans for Federal Aid Participation projects and 43 ROW plans for non-participation projects, for a total of 49. (See Figure FY 2012 – 2021 Federal Aid ROW Plan Authorizations).

Figure - FY 2012 – 2021 Federal Aid ROW Plan Authorizations




8. HQ ROW staff and Region ROW staff continue to conduct systematic file reviews. The COVID-19 pandemic and associated restrictions precluded the possibility of field visits in FY 21. However, the ROW Program began implementing workflows in CDOT's electronic records management system called OnBase. The workflows allow for ROW acquisition files to be more accessible for review, reference, and comparison to ensure statewide consistency. Implementation efforts will continue into FY 22 and FY 23 with increased access and use by Region ROW staff and an expansion to include relocation documents.

9. The CDOT ROW Program provided virtual training to statewide ROW staff in the format first developed in FY 2020. Trainings were given on July 10, July 24, August 7, August 18, September 4, September 17, September 22, October 20, January 26, and June 18. The focus of the training sessions included lessons learned from eminent domain trials, eminent domain appraisal components, researching CDOT records using GIS, reading ROW plans, ROW plan authorization requirements, pre-construction project management, a case study of a residential water well relocation, and common issues with landowner W-9s. HQ ROW continued to provide training and technical assistance to consultants, local agencies and CDOT Region ROW staff as requested.

## PERFORMANCE MEASURES

The following performance measures demonstrate the health of the Right of Way Program: CDOT will continue to track Conditional Clearance, Condemnation, Fair Market Value
Settlement Rate, and Appeals statistics and compare against the prior 10 years to identify major deviations and trends.

**Table - Performance/Compliance Measures (ROW)**

| PM # | Measure | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline | 10-Year Avg. | 2021 |
|---|---|---|---|---|---|---|---|
| 319 | Conditional clearances | Percentage of Federal-aid projects with conditional ROW certifications | A list of conditional clearances | State FY | Track trend | 20.7 | 22 |

| PM # | Measure | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline | 10-Year Avg. | 2021 |
|---|---|---|---|---|---|---|---|
| 320 | Condemnations | Percentage of parcels acquired using condemnation | Uniform Act Relocation Assistance and Real Property Acquisition Statistical report as required by 49 CFR, Appendix B | State FY | Track trend | 11.7 | 6 |
| 322 | Fair market value settlement rate | The percentage of parcels settled at FMV | Calculation of the number of parcels that settled at FMV versus the total number of parcels acquired | State FY | Track trend | 69% | 75% |
| 321 | Appeals | The number of appeals filed each year | A list of appeals | State FY | Track trend | 1.2 | 0 |
| 426 | ROW Customer Service Survey | ROW appraiser and agent customer service rating | ROW customer service survey by Region | State FY | Achieve very good or better in all categories | 4.4 | 4.68 |

Additional detail on the performance measures is provided below:

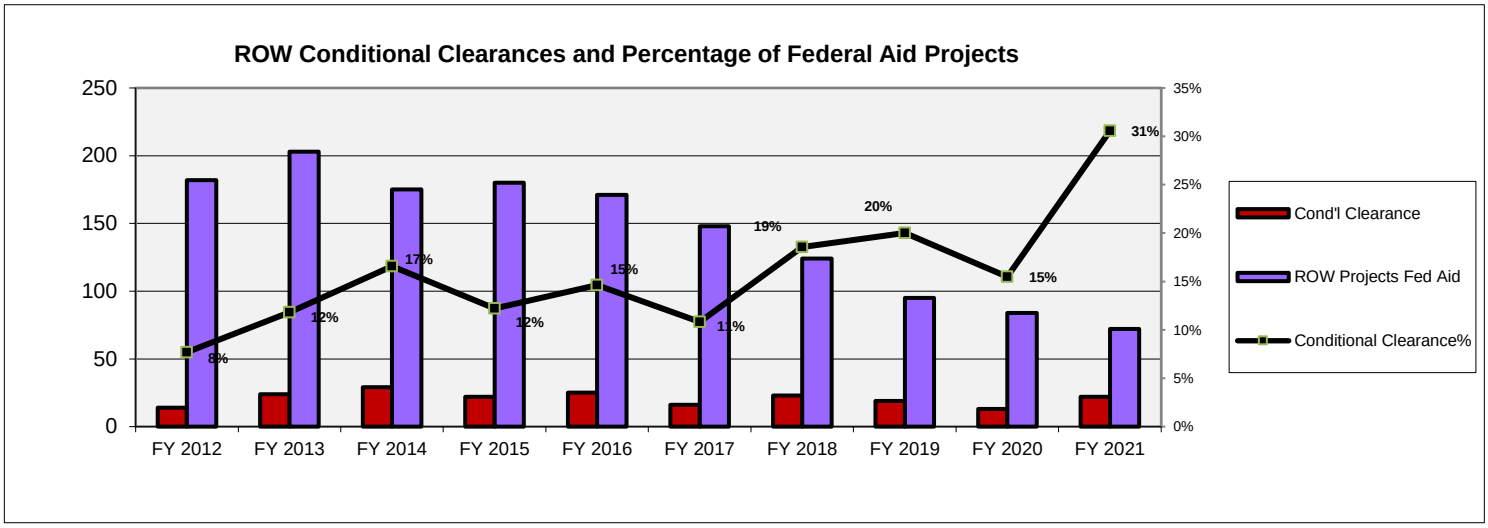
10. Conditional Clearances – Percentage of Federal Aid projects with conditional ROW certifications was 31%. While the percentage has increased significantly over prior years, the total number of conditional clearances remains near historical averages, so at least part of the change can be attributed to CDOT more readily closing Federal Aid projects. A review conducted in FY 21 revealed that only 4 out of 1,117 construction contract change orders from FY 18 to FY 20 were due to ROW delays. Whether the higher rate of conditional clearances has an impact on change orders will be monitored.

Table - FY 2012 – 2021 Federal Aid Projects with Conditional Clearances

| Federal Aid Projects with ROW Conditional Clearances | FY 2012 | FY 2013 | FY 2014 | FY 2015 | FY 2016 | FY 2017 | FY 2018 | FY 2019 | FY 2020 | FY 2021 | 10-Year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Federal Aid Projects with ROW | 182 | 203 | 175 | 180 | 171 | 148 | 124 | 95 | 84 | 72 | 143.4 |
| Conditional Clearances (granted) | 14 | 24 | 29 | 22[1] | 25[1] | 16[1] | 23[1] | 19[1] | 13[1] | 22[1] | 20.7 |
| Percentage of Conditional Clearances | 8% | 12% | 17% | 12% | 15% | 11% | 19% | 20% | 15% | 31% | 14% |

[1] FY 2015, 2016, 2017, 2018, 2019, 2020 & 2021 Clearances include Local Public Agency (LPA) project

Figure - FY 2012 – 2021 Federal Aid Projects with ROW Conditional Clearances




11. Condemnations – In FY 2020, 349 acquisitions were conducted. Six (6) acquisition cases were forwarded to the Office of the Attorney General for the initiation of condemnation proceedings. Two (2) cases resulted in acquisition by condemnation (via court award).

Table - FY 2012 – FY 2021 Condemnations – Cases Settled

| Condemnations - Cases Settled | FY 2012 | FY 2013 | FY 2014 | FY 2015 | FY 2016 | FY 2017 | FY 2018 | FY 2019 | FY 2020 | FY 2021 | 10-Year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Number of Acquisitions (Acq.) | 252 | 264 | 175 | 197 | 395 | 252 | 427 | 358 | 317 | 349 | 309 |
| Parcels Acquired by Region Administrative Settlement / % of Total Acq. | 0 / 0% | 0 / 0% | 0 / 0.0% | 0 / 0% | 0 / 0% | 0 / 0% | 2 / 0.5% | 9 / 2.5% | 1 / 0.3% | 2 / 0.6% | 1.6 |
| Parcels Acquired by Legal Settlement / % of Total Acq. | 10 / 4.0% | 20 / 7.6% | 16 / 9.1% | 10 / 5.1% | 6/ 1.5% | 3 / 1.2% | 1 / 0.2% | 1 / 0.3% | 1 / 0.3% | 0 / 0% | 6.8 |
| Parcels Acquired by Negotiation / % of Total Acq. | 0 / 0% | 0 / 0% | 0 / 0% | 0 / 0% | 0 / 0% | 0 / 0% | 0 / 0% | 0 / 0% | 1 / 0.3% | 2 / 0.6% | 0.5 |
| Parcels Acquired Using Condemnation (via court award) / % of Total Acq. | 1 / 0.4% | 0 / 0% | 1 / 0.6% | 1 / .5% | 1 / 0.3% | 2 / 0.8% | 2 / 0.5% | 9 / 2.5% | 9 / 2.8% | 2 / 0.6% | 2.7 |
| TOTAL (Cases) / % of Total Acq. | 11 / 4.4% | 20 / 7.6% | 17 / 9.7% | 11 / 5.6% | 7 / 1.8% | 5 / 1.4% | 6 / 1.4% | 19 / 5.3% | 12 / 3.79% % | 6 / 1.7% | 11.7 |

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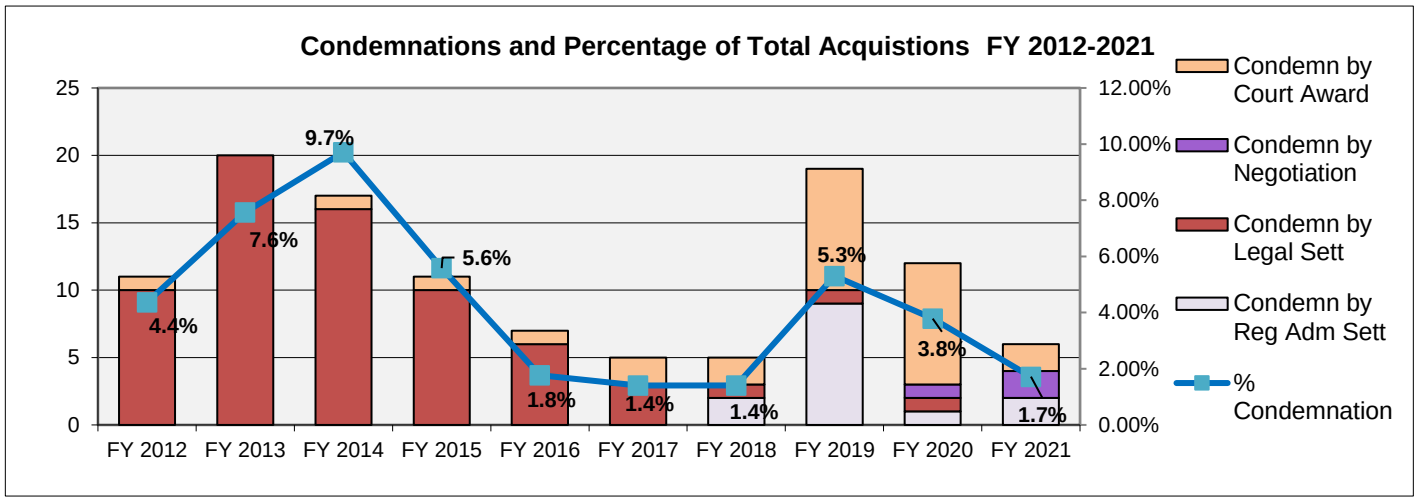
Figure - FY 2012 – FY 2021 Condemnations




12. Statewide acquisition settlement rate at Fair Market Value: 75%. When including parcels that were acquired under the Voluntary ADA Acquisition Program, the acquisition settlement rate at Fair Market Value was 82%. Most of these additional acquisitions were below $5,000 with offer amounts determined through streamlined procedures. Furthermore, parcels that could not be acquired were removed from the project, so the acquired parcels are not included in the baseline statistic.

    Tracking the settlement rate at Fair Market Value (FMV) is used as one gauge to assess the overall health of the CDOT ROW Program. Settlement rates are influenced by the strength and quality of the property rights valuations and the negotiation skills of the acquisition agents. The ROW Program's consistent settlement rate trend in the 60-75% range is interpreted as evidence that the property owners from whom CDOT acquires property rights have confidence in CDOT's valuation methods and outcomes used to determine the FMV. Similarly, the trend also indicates that the acquisition agents meeting and negotiating with the property owners are doing a very good job of explaining CDOT's valuation and acquisition processes, and then negotiating toward the final acquisition price.

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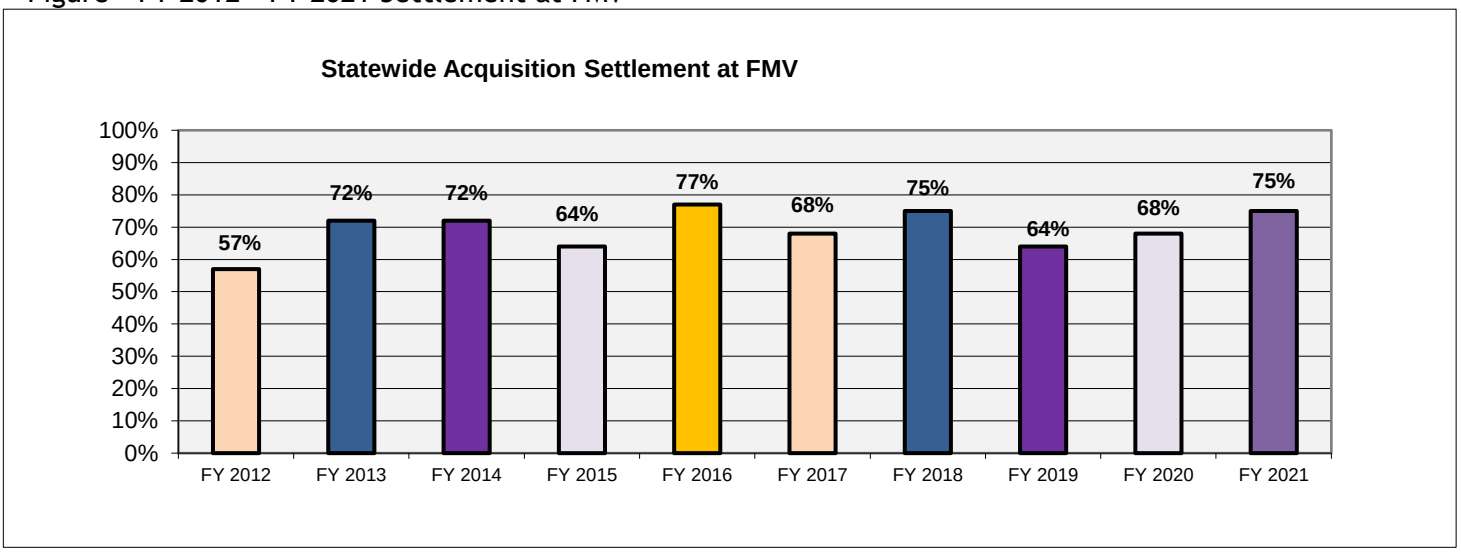
Figure - FY 2012 – FY 2021 Settlement at FMV




13. Beginning in FY 19, CDOT ROW began tracking the FMV settlement rate at three different valuation thresholds to reflect the different valuation methods used and to provide additional context to the FMV Settlement Rate statistic. The three thresholds are: 1) FMVs under $5,000 where the landowner does not have a right to obtain an appraisal at CDOT's expense; 2) FMVs between $5,000 and $25,000 where CDOT may perform waiver valuations, but the landowner is provided an option of obtaining an appraisal; and 3) FMVs above $25,000 where CDOT will always perform appraisal and the landowner is provided an option of obtaining an appraisal. In FY 2021, the FMV settlement rate below $5,000 was 86%, between $5,000 and $25,000 was 68%, and above $25,000 was 43%.

Table - FY 2012 – FY 2021 FMV Settlement Rates

| FMV Settlement Rate | FY 2012 | FY 2013 | FY 2014 | FY 2015 | FY 2016 | FY 2017 | FY 2018 | FY 2019 | FY 2020 | FY 2021 | 10-Year Avg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FMV Settlement Rate below $5,000 | NA | NA | NA | NA | NA | NA | 82% | 77% | 86% | 86%[2] | 83%[1] |
| FMV Settlement Rate between $5,000 and $25,000 | NA | NA | NA | NA | NA | NA | 66% | 48% | 68% | 68%[2] | 63%[1] |
| FMV Settlement Rate above $25,000 | NA | NA | NA | NA | NA | NA | 50% | 34% | 27% | 43%[2] | 40%[1] |
| TOTAL FMV Settlement Rate | 57% | 72% | 72% | 64% | 77% | 68% | 75% | 64% | 68% | 75%[2] | 69%[1] |

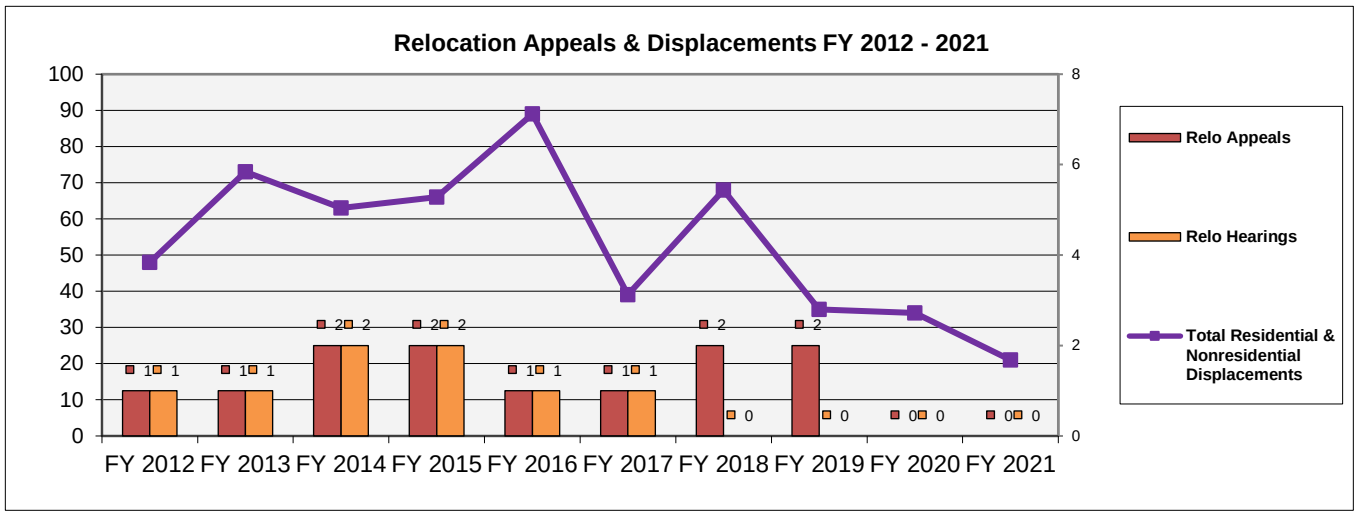
[1]10-Year FMV Settlement Rates only reflect 4 years of data for the three valuation thresholds
[2]FY 2021 FMV Settlement Rates including ADA Program: <$5K – 92%; $5K-$25K – 68%; >$25K – 43%; Total – 82%

14. Appeals – Zero (0) relocation appeals were filed.

Table - FY 2012 – FY 2021 Appeals

| Appeals | FY 2012 | FY 2013 | FY 2014 | FY 2015 | FY 2016 | FY 2017 | FY 2018 | FY 2019 | FY 2020 | FY 2020 | 10-year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Appeals Filed | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 0 | 0 | 1.2 |
| Appeals that went to Hearings | 1 | 1 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0.8 |
| Total Residential and Nonresidential Displacements | 48 | 73 | 63 | 66 | 89 | 39 | 68 | 35 | 34 | 21 | 53.6 |

Figure - FY 2012 – 2021 Appeals




## ROW Customer Service Survey

Mid FY 2010, CDOT ROW began the process of surveying the public impacted by ROW acquisition and/or relocation. That survey was a Quality Assurance Review (QAR) effort and, although it was conclusive, CDOT has decided to continue these efforts to assure continued high-quality customer service to the public. For FY 2021, the rate of return on this survey was 28%. Following are statewide results of said survey for FY 2021 and FY 2020. In FY 2021, CDOT achieved very good or better in all categories, and an overall rating of 4.68, which was higher than the 10-year average of 4.40. Region ROW Managers are provided individual survey results on an annual basis.

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Figure - FY 2021 ROW Customer Survey

## Colorado Department of Transportation:
## Right of Way Customer Service Survey
## (FY 2021 Information Summary - STATEWIDE)

We are striving to provide excellent customer service and request for your assistance. Please take a moment to fill out this survey and give us your constructive input. Please skip any questions that are not applicable to your experience. Please return this survey to us in the provided envelope, or send to CDOT – ROW, 4201 E. Arkansas Ave., Denver, CO 80222.

**Appraiser** — **Average Ratings**

1. What was the Appraiser's name who worked with you? (See Details on Compilation Sheet)

2. How well did the Appraiser explain the appraisal process to you? (Please circle one) — 4.48 *

| *Excellent* | *Very Good* | *Good* | *Fair* | *Poor* |
|---|---|---|---|---|

3. How well did the Appraiser work with you when your appraisal visit was conducted? — 4.48 *

| *Excellent* | *Very Good* | *Good* | *Fair* | *Poor* |
|---|---|---|---|---|

4. Were your questions answered in a clear and timely manner? (Please circle one) — 1.00 **

| *Yes* | *No* |
|---|---|
| 100.00% | 0.00% |

*Comments* (See Details on Compilation Sheet)

**Acquisition Agent**

1. What was the Agent's name who worked with you on Acquisition? (See Details on Compilation Sheet)

2. How well did the Acquisition Agent explain the project as it related to your property? — 4.78 *

| *Excellent* | *Very Good* | *Good* | *Fair* | *Poor* |
|---|---|---|---|---|

3. Were you comfortable with the amount of time you had to consider the offer for your property? — 1.00 **

| *Yes* | *No* |
|---|---|
| 100.00% | 0.00% |

*Comments* (See Details on Compilation Sheet)

4. Were your questions answered by the Acquisition Agent in a clear and timely manner? — 1.00 **

| *Yes* | *No* |
|---|---|
| 100.00% | 0.00% |

*Comments* (See Details on Compilation Sheet)

**Relocation Agent**

1. What was the Agent's name who worked with you on Relocation? (See Details on Compilation Sheet)

2. How well did the Relocation Agent explain the project as it related to your property? — 5.00 *

| *Excellent* | *Very Good* | *Good* | *Fair* | *Poor* |
|---|---|---|---|---|

3. Were you comfortable with the amount of time you had to consider your Relocation offer? — 1.00 **

| *Yes* | *No* |
|---|---|
| 100.00% | 0.00% |

*Comments* (See Details on Compilation Sheet)

4. Were your questions answered by the Relocation Agent in a clear and timely manner? — 1.00 **

| *Yes* | *No* |
|---|---|
| 100.00% | 0.00% |

*Comments* (See Details on Compilation Sheet)

**Other**

Do you have any other comments or questions about the service we provided? Please feel free to write on the back of this sheet as well. Please include your name and contact information if you would like a response.

(See Details on Compilation Sheet)

**Overall Rating** **4.68**

Number of Surveys Disbursed: 181
Number of Surveys Received: 51
Response Rate: 28.18%

* Excellent = 5, Very Good = 4, Good = 3, Fair = 2, Poor = 1
** Yes = 1, No = 0

Figure - Prior ROW Customer Survey, FY 2020

# Colorado Department of Transportation:
# Right of Way Customer Service Survey
# (FY 2020 Information Summary - STATEWIDE)

We are striving to provide excellent customer service and request for your assistance. Please take a moment to fill out this survey and give us your constructive input. Please skip any questions that are not applicable to your experience. Please return this survey to us in the provided envelope, or send to CDOT – ROW, 4201 E. Arkansas Ave., Denver, CO 80222.

**Appraiser** — Average Ratings

1. What was the Appraiser's name who worked with you? (See Details on Compilation Sheet)

2. How well did the Appraiser explain the appraisal process to you? (Please circle one) — 4.18 *

| *Excellent* | *Very Good* | *Good* | *Fair* | *Poor* |
|---|---|---|---|---|
| | | | | |

3. How well did the Appraiser work with you when your appraisal visit was conducted? — 4.12 *

| *Excellent* | *Very Good* | *Good* | *Fair* | *Poor* |
|---|---|---|---|---|
| | | | | |

4. Were your questions answered in a clear and timely manner? (Please circle one) — 0.91 **

| *Yes* | *No* |
|---|---|
| 90.91% | 9.09% |

*Comments* (See Details on Compilation Sheet)

**Acquisition Agent**

1. What was the Agent's name who worked with you on Acquisition? (See Details on Compilation Sheet)

2. How well did the Acquisition Agent explain the project as it related to your property? — 4.37 *

| *Excellent* | *Very Good* | *Good* | *Fair* | *Poor* |
|---|---|---|---|---|
| | | | | |

3. Were you comfortable with the amount of time you had to consider the offer for your property? — 0.99 **

| *Yes* | *No* |
|---|---|
| 98.81% | 1.19% |

*Comments* (See Details on Compilation Sheet)

4. Were your questions answered by the Acquisition Agent in a clear and timely manner? — 1.00 **

| *Yes* | *No* |
|---|---|
| 100.00% | 0.00% |

*Comments* (See Details on Compilation Sheet)

**Relocation Agent**

1. What was the Agent's name who worked with you on Relocation? (See Details on Compilation Sheet)

2. How well did the Relocation Agent explain the project as it related to your property? — NA *

| *Excellent* | *Very Good* | *Good* | *Fair* | *Poor* |
|---|---|---|---|---|
| | | | | |

3. Were you comfortable with the amount of time you had to consider your Relocation offer? — NA **

| *Yes* | *No* |
|---|---|
| NA | NA |

*Comments* (See Details on Compilation Sheet)

4. Were your questions answered by the Relocation Agent in a clear and timely manner? — NA **

| *Yes* | *No* |
|---|---|
| NA | NA |

*Comments* (See Details on Compilation Sheet)

**Other**

Do you have any other comments or questions about the service we provided? Please feel free to write on the back of this sheet as well. Please include your name and contact information if you would like a response.
(See Details on Compilation Sheet)

**Overall Rating** 4.23

Number of Surveys Disbursed: 145
Number of Surveys Received: 86
Response Rate: 59.31%

* Excellent = 5, Very Good = 4, Good = 3, Fair = 2, Poor = 1
** Yes = 1, No = 0

## KEY LEARNINGS

FY 2021 saw both a reduction in the total number of condemnations and an increase in the Fair Market Value Settlement rate with both figures being near or exceeding historic averages in the current year. The fair market value settlement rate increased in all valuation levels.

Due to a lower fair market value settlement rate in prior years for parcels valued above $25,000, the ROW Program began ongoing analysis of administrative settlements at this level. Initial analysis suggests that over one-third of settlements are due to large differences in unit value between CDOT and owner appraisals. Other settlements have been caused by property-specific impacts such as water rights. Overall, differences in opinion regarding damages and cost-to-cure considerations have not been a primary driver of settlements.

The ROW Program found that there was continued interest for virtually delivered training and enthusiasm, even after some staff returned to working in the office or on a hybrid schedule.

## NEXT STEPS

CDOT will continue to its ongoing analysis of the Fair Market Value Settlement Rate at the higher valuation and look to address any findings within the CDOT appraisal program when necessary. If settlements are being reached above Fair Market Value to avoid condemnation proceedings, CDOT will continue to encourage the continuation of this practice and look for a corresponding continued reduction in the number of condemnations.

CDOT will continue to provide virtual training with a goal of at least one event per month. A current focus of the ROW Program is regular staff-level meetings of the specialty groups (survey, appraisal, and acquisition/relocation) to promote the sharing of ideas and best practices.

The ROW Program will monitor the lower response rate of customer service surveys to determine if alternative data collection methods should be used.

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# 2.8 ENGINEERING: STRUCTURES

## INTRODUCTION

**CDOT Manager:** Mike Collins and Natasha Butler (Alternate)

**FHWA Manager:** Spencer Tucker

The Structures Program is responsible for working with the Regions to ensure structures are properly designed, constructed, and maintained throughout the state. Structures include major structures (bridges and culverts that span more than 20 feet); minor structures (culverts and bridges that span 4 to 20 feet); overhead sign structures; high mast luminaires and mast arm traffic signals; retaining walls; noise walls; and tunnels. The staff of the Structures program develops structural design requirements, standard structural details, and structural construction specifications. In addition, the Structures program evaluates structural products and materials. The Structures program provides the vital services of structure inspection, fabrication inspection, construction assistance, structure asset management, bridge load rating, and oversize overweight vehicle permit investigations.

## QUALITY/RESULTS

**Staff Bridge Branch Activities:**

1. The FHWA Colorado Division Bridge Engineer is invited to the monthly Staff Bridge BRIAR Meeting to discuss records, inspection, asset management, and ratings to review process and policy surrounding program management best practices and state/federal compliance. The FHWA Colorado Division Bridge Engineer is also invited to the biweekly Staff Bridge Unit Leader Meetings where issues with the Department's structures program and needed improvements are identified, process improvements are discussed, and process improvements are implemented with regards to design policy and branch direction.

2. Funds continue to be directed to On-System bridge preventative maintenance actions,bridge repairs requiring engineering, and bridge rehabilitations, per the CDOT Transportation Asset Management Plan.

3. Development of SIMSA began in 2018 which will expand the data collection to all structural assets, improve data collection quality and timeliness, be web-based and spatially driven, reduce paper usage, reduce inspection costs for savings reallocation to projects, and expand the access to structure data for CDOT personnel at all levels. Phase II of this project received Notice to Proceed in December 2021, with an expected completion of December 2023. Phase II is the final phase of the initial development for SIMSA.

4. Staff Bridge continues to work with the CDOT Office of Financial Management and Budget (OFMB) on Off-System Bridge Program process improvement to better manage off-system funding and awarded projects tracking from award to completion.

5. Consultants have been selected to perform nondestructive evaluation of post-tensionedbridges and efforts have begun to implement the first task order.

6. Staff Bridge has completed all ratings of bridges on the Interstate and is taking steps to complete the ratings on structures within reasonable access for Emergency Vehicles (EVs) and is continuing to rate required bridges for Specialized Hauling Vehicles (SHVs), with an expected completion date of December 2022. These efforts are reducing the risk of bridge overloading due to EVs and SHVs.

7. A more formal process for tracking construction-related issues with CDOT's structures across the state is in development. These efforts include the development of a Joint Process Review with QIC started in 2020, as well as three consultant contracts that are being utilized to

develop a tracking database, construction inspection training, and augment Staff Bridge construction inspection staff capacity. FHWA has also supported CDOT in awarding support fromthe Resource Center. A draft tracking database has been developed and is currently under revision for implementation. Additionally, construction inspection training has been developed and the first class was hosted in December 2021.

8. Staff Bridge has begun to track projects in more detail to capture (a) construction milestones for new structures, (b) potential construction-related issues with structures (c) lifecycle costs for structures. This includes bi-weekly meetings with unit leaders to discuss updates with projects, as well as a new full-time position – the Statewide Bridge Project Portfolio Manager. The Statewide Bridge Project Portfolio Manager is responsible for tracking and communication regarding projects that include structures. The Statewide Bridge Project Portfolio Manager developed a tracking database and is revising the database alongside revising the process for developing the four-year list of bridge treatments.

9. A pilot project to define a new timber girder repair design that can be implemented at a statewide level to increase the longevity of CDOT's timber structures, improve load carrying capacity, and reduce the number of poor timber bridges is mostly complete. The Transportation Commission set aside funding to implement pilot projects in other regions and install the selected sister beam repair on select timber bridges around the state.

**Region Activities:**

1. The Branch produces an essential repair tracking report. The essential repair finding spreadsheet is effective in tracking maintenance needs, identifying future structure project work, and the subsequent repairs.

2. Regions bridge maintenance continue to schedule essential repair work.

3. Regions have been allocated $1M each to develop a Bridge Bundle Planning and Prioritization project, which will be used to position for grant opportunities and to ensure quick and efficient use of any federal, state, or stimulus funding that may be allocated for bridges. All of the regions have active consultant task orders or are in the process of starting consultant task orders to develop plans. Region 1 wrapped up most work on their plan in December 2021and has begun design work on high priority projects.

4. Regional Bridge Maintenance Crews continue to perform preventative maintenance in bridge rinsing actions on the deck, bearings, drainage, and other critical elements to ensure the longevity of CDOT's bridges.

5. Regions 2 and 5 completed pilot timber bridge repair projects in-house utilizing the newtimber girder repair design.

## PERFORMANCE MEASURES

The following performance measures demonstrate the health of the Structures Program. CDOT updates the bridge1 reporting data annually in April.

Table - Performance/ Compliance Measures (Structures)

| PM# | Measure | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline | 2020 | 2021 |
|---|---|---|---|---|---|---|---|
| 745, 746, 747 | NHS bridges[1] and deck area in Poor condition (FHWA Definition) | Number of Poor bridges* per NHS<br><br>Deck area of Poor bridges* per NHS<br><br>Percentage of Poor deck area per NHS | Staff Bridge annual asset management reports | State FY | National Performance Measure Targets: 2020: 4% 2022: 4% | 117<br>1.90M sf<br>5.88% | 107<br>1.65M sf<br>5.08% |
| 748, 749, 750 | NHS bridges[1] and deck area in Good condition (FHWA Definition) | Number of Good bridges* per NHS<br><br>Deck area of Good bridges* per NHS<br><br>Percentage of Good deck area per NHS | Staff Bridge annual asset management reports | State FY | National Performance Measure Targets: 2020: 45% 2022: 44% | 1,107<br>13.7M sf<br>42.36% | 1,015<br>12.1M sf<br>37.33% |

[1]The term “bridge” is used in place of “major structures”, which includes all bridge and culvert structures carryingvehicular traffic and that span more than 20 feet along the centerline of the carried roadway.

Additional detail on the performance measures is provided below:

Figure – NHS Bridge Condition

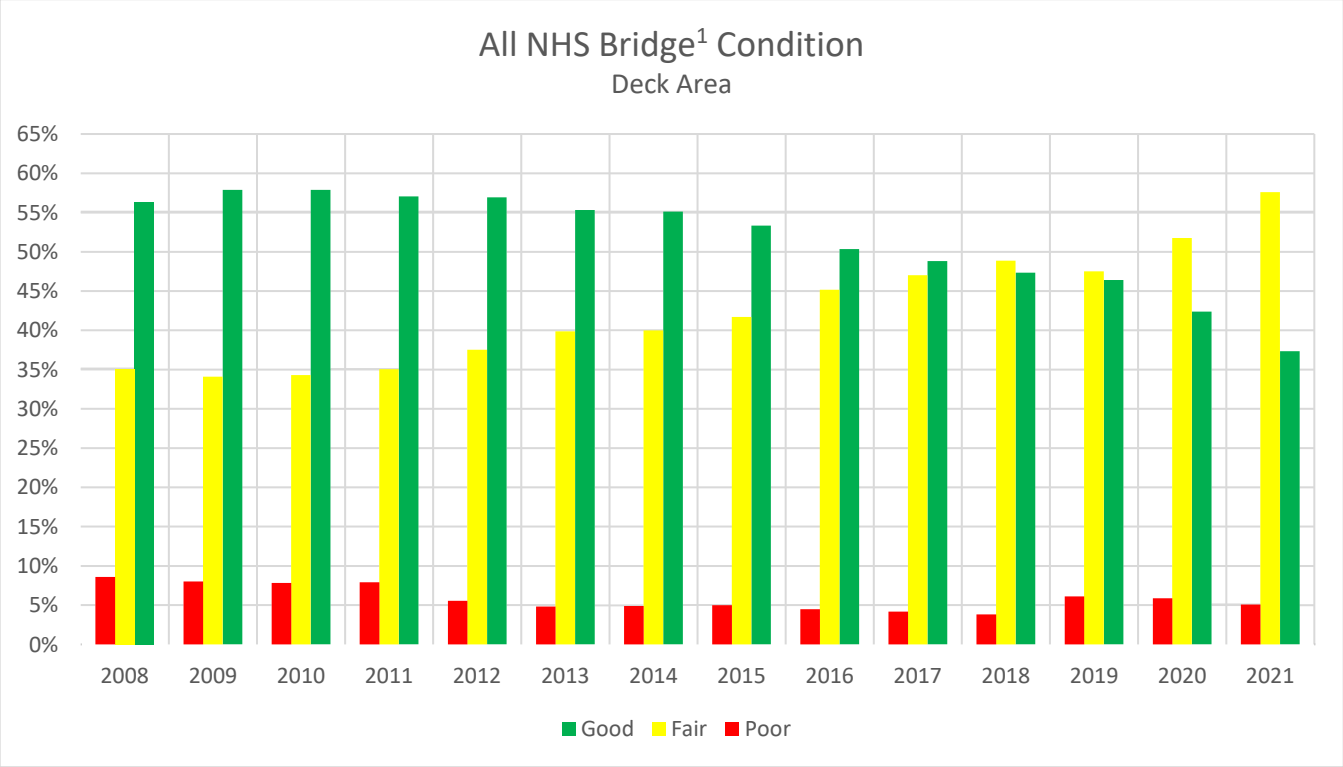
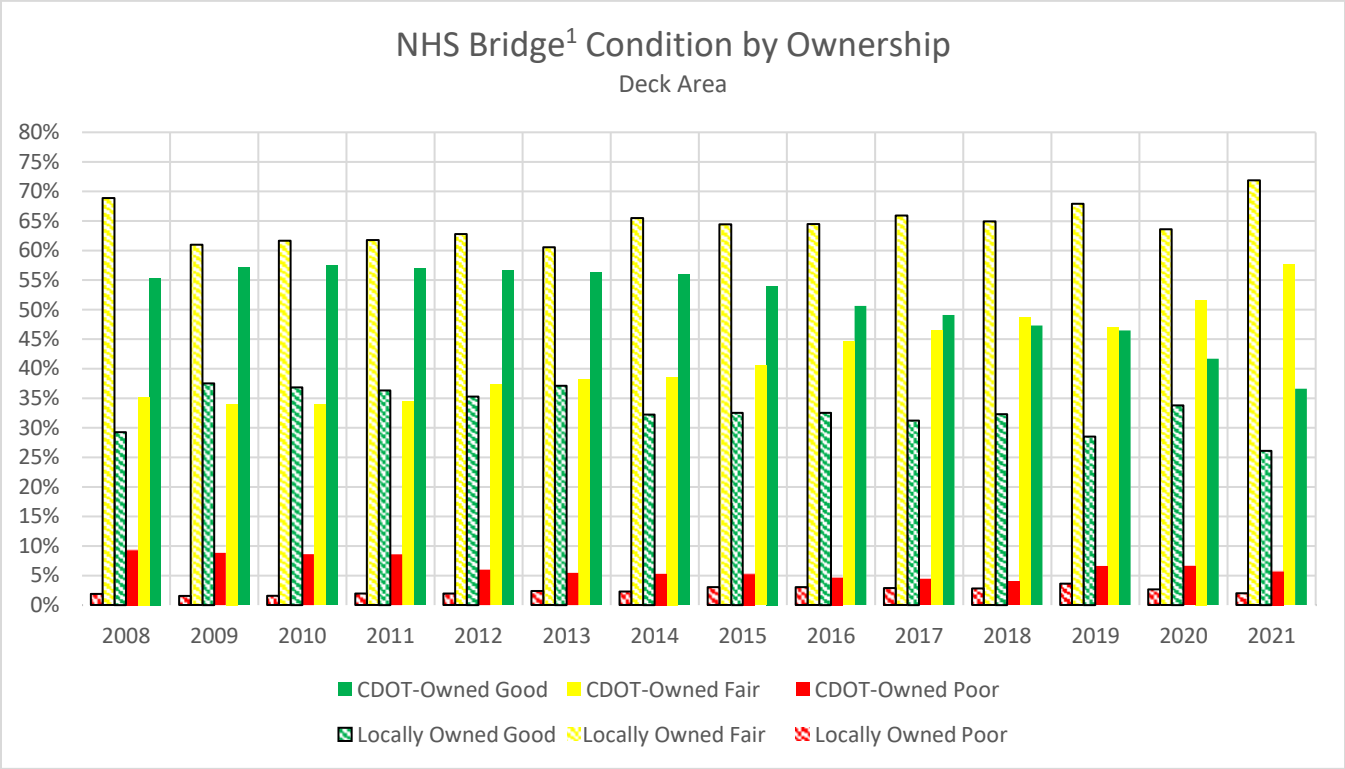


Figure – NHS Bridge Condition by Ownership




## KEY LEARNINGS

No key learnings were identified.

## NEXT STEPS

1. Finalize the formal process for tracking construction-related issues with CDOT's structures across the state.

2. Support region delivery of timber girder repairs, including design guidance and analysis aswell as facilitating conversations regarding lessons learned and project successes.

3. Continue support of regional development of Bridge Bundle Planning and Prioritization,including data analysis.

4. Implement tracking for open Essential Repair Findings with the goal of reducing the numberof open ERFs.

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# 2.9 ENGINEERING: TRAFFIC SAFETY AND ENGINEERING SERVICES

## INTRODUCTION

**CDOT Manager**: San Lee and Alternates: David Swenka, Ben Acimovic, and Manjari Bhat

**FHWA Manager**: Dahir Egal

The Traffic Safety and Engineering Services Branch (The Branch), in collaboration with the CDOT Office of Transportation Safety (OTS) and multiple other safety stakeholders, focuses on reducing fatalities and serious injuries resulting from crashes on the transportation system. The Branch is the steward responsible for developing, maintaining, and coordinating delivery of the Highway Safety Improvement Program (HSIP) (as defined by 23 CFR 924) for CDOT.

The Branch coordinates with the regional traffic engineers to plan and deliver HSIP funding to safety improvement projects along all public roadways statewide, including high-risk rural roads. The Branch is responsible for developing and maintaining the FHWA-mandated Strategic Highway Safety Plan (SHSP). CDOT has updated the plan in 2020, referred to as the Colorado Strategic Transportation Safety Plan (STSP). CDOT understands the importance of a vision of transportation safety and works with Colorado stakeholders to form that vision – Zero Deaths and Serious Injuries.CDOT continues to work with its stakeholders to implement the 2020-2023 STSP plan. FHWA and CDOT will ensure that STSP implementation efforts are developed and tracked for each emphasis area identified.

The STSP also provides a roadmap for development of the annual Colorado Integrated Safety Plan (ISP). The ISP is a comprehensive program and project plan for addressing both behavioral and engineering safety issues. The ISP meets the annual safety program planning requirements of the NHTSA. The goal of the program is to reduce traffic deaths on Colorado's highways. Primary focusesof the program, implemented by OTS, include reducing impaired driving related traffic deaths, motorcycle, and pedestrian fatalities, and increasing adult seat-belt use. Public information and outreach activities are coordinated through the program, as are training and education services and high visibility and enforcement (HVE). The OTS administers the state's traffic safety program funded by the NHTSA.

The STSP also provides a basis for delivering HSIP funding. The Branch works with regional traffic engineers and local agencies to identify and construct cost-effective projects that improve safety on Colorado's roadways. This is accomplished by assessing the nature and magnitude of safety problems on roadways in a region, county, or town and providing adequate information to support the development of an investment strategy to resolve the problems. Finally, a cost-benefit analysisaffirms that the regions select the most beneficial and cost-effective safety projects for implementation.

Statistically based and consistent with the Highway Safety Manual (HSM), the Branch applies advanced safety performance functions (SPF) and diagnostic analysis to identify statewide locations of high crash concentrations with potential for crash reduction. This safety analysis applies to the HSIP as well as most types of projects delivered by the state by means of project-safety assessments done during the early planning and design phases.

The Branch also acts as the state's repository for statewide traffic crash information. Approximately 120,000 crash records are reported in a calendar year. The Branch administers both the National Highway Traffic Safety Administration (NHTSA) and FHWA funding to improve the accuracy, completeness, timeliness, and availability of the data after receiving the statewide crash records from the Department of Revenue. The Branch serves on and carries out the strategic plan of the Statewide Traffic Records Advisory Committee (STRAC), made up of representatives from the Colorado Departments of Transportation, Revenue, Public Health and Environment, Human Services,Public Safety, and the Judicial Department. Crash data serves as the foundation for planning safety improvement projects and programs.
State agencies rely on crash data to meet the requirements of the federal FAST Act (Fixing America's

Surface Transportation Act, December 4, 2015), which includes timeliness, accuracy,uniformity, integration, and accessibility of data suitable for problem identification and countermeasure analysis. CDOT puts forth significant effort to cultivate a crash data set that possesses these attributes. CDOT remains committed to improving its safety data and has established a goal to keep crash data processing backlogs to no more than six months.

**QUALITY/RESULTS**

1. Traffic Fatalities – The mission of both the OTS and the Branch is to "reduce the incidence and severity of motor vehicle crashes and the associated human and economic loss." In 2020, there were 622 reported traffic fatalities reported in Colorado. This is a four percent increasefrom 597 fatalities in 2019. While 2021 crash data is currently being verified and is not yet official, preliminary indications show that the number of fatalities (688) has increased at least11 percent from 2020. While CDOT has continued to deliver programs that engineer safer highways, educate the driving public, recommend traffic safety legislative enhancements, andconduct high-visibility enforcement of the State's driving laws, fatalities and the fatality rate continued to increase.

   Many of the most serious transportation safety challenges continue to be driver behavior related - impaired driving and the lack of occupant protection compliance (seat belts). These driver behaviors are leading to an increase in vulnerable user fatalities. In fact, fatalities to pedestrians, motorcyclists, and speed related continue to remain high or increase each year. The OTS aggressively addresses these challenges by supporting projects, programs, and other measures to educate the public and raise awareness. Public information programs and high- visibility enforcement have served to raise the awareness of the public of the risks of driving andtheir responsibilities as drivers. Grassroots organizations, state partnerships, and local community efforts also have had a significant impact.

   Below is a snapshot of how fatalities have changed from previous years in certain areas. Note:some of the fatalities below are accounted for in multiple categories.

   Table - Change in Type of Fatalities – 2015-2020

| Traffic Fatalities by Category | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Off roadway crash (FHE)* | 234 | 235 | 236 | 244 | 241 | 242 |
| Intersection related* | 153 | 200 | 190 | 210 | 188 | 196 |
| Speeding related* | 217 | 211 | 230 | 210 | 239 | 287 |
| Unrestrained (excluding MC)+ | 191 | 192 | 233 | 221 | 200 | 208 |
| Impairment related* | - | - | 254 | 246 | 241 | 265 |
| Rollover/Overturn (FHE; excluding MC)* | - | - | 60 | 68 | 55 | 62 |
| Motorcycle/Scooters+ | 106 | 125 | 103 | 103 | 103 | 140 |
| Aging road user 65+ (all person types)+ | 95 | 109 | 113 | 110 | 115 | 65 |
| Pedestrian (any event)+ | 64 | 84 | 92 | 90 | 76 | 93 |
| Head-on crash (FHE)* | 51 | 57 | 78 | 74 | 66 | 66 |
| Rear-end crash (FHE)* | 35 | 40 | 40 | 30 | 28 | 25 |
| Live animal crash (FHE)* | 7 | 4 | 5 | 2 | 2 | 5 |

   *Source: Fatal Analysis Reporting System (FARS)
   +Source: CDOT Crash Data Fatal Tracker
   FHE = First Harmful Event
   MC = Motorcycles/Scooters

2. National Safety Performance Measures - Now in its fourth year of implementation, CDOT met with safety stakeholders and established 2018-2022 safety performance measure targets. Belowis a table of the last four years so far for comparison.

Table – Colorado Safety Targets - Actual vs. Target for 4 Years

| Colorado Safety Targets | | Time Period | | | |
|---|---|---|---|---|---|
| | | 2015-2019 | 2016-2020 | 2017-2021 | 2018-2022 |
| | Baseline: | 2013-2017 | 2014-2018 | 2015-2019 | 2016-2020 |
| | Targets must be set by: | Jul-2018 | Jul-2019 | Jul-2020 | Jul-2021 |
| | Data / Results will be official: | Jan-2021 | Jan-2022 | Jan-2023 | Jan-2024 |
| Fatalities | Target | 644.0 | 618.0 | 603.0 | 597.0 |
| | Baseline | 554.6 | 584.6 | 606.4 | 621.4 |
| | Actual / Preliminary | 606.2 | 621.4 | 637.4 | |
| | Target Met? | Yes | No | No | |
| Fatality Rate | Target | 1.210 | 1.143 | 1.113 | 1.093 |
| | Baseline | 1.098 | 1.126 | 1.146 | 1.184 |
| | Actual / Preliminary | 1.144 | 1.183 | 1.206 | |
| | Target Met? | Yes | No | No | |
| Serious Injuries | Target | 2909.0 | 3271.0 | 3161.0 | 3194.0 |
| | Baseline | 3148.6 | 3193.8 | 3188.6 | 3096.6 |
| | Actual / Preliminary | 3177.0 | 3100.6 | 3141.6 | |
| | Target Met? | No | Yes | Yes | |
| Serious Injuries Rate | Target | 5.575 | 6.075 | 5.828 | 5.846 |
| | Baseline | 6.268 | 6.175 | 6.030 | 5.887 |
| | Actual / Preliminary | 6.006 | 5.913 | 5.931 | |
| | Target Met? | No | Yes | No | |
| Non-motorized Users Fatalities and Serious Injuries | Target | 514.0 | 670.0 | 551.0 | 571.0 |
| | Baseline | 555.2 | 555.2 | 558.8 | 540.6 |
| | Actual / Preliminary | 558.6 | 542.4 | 548.4 | |
| | Target Met? | No | Yes | Yes | |

The above measures reflect the trend that Colorado is seeing general increases in these categories, and we expect to continue to see increases in the future. While all safety stakeholders in Colorado are striving to reduce crashes and fatalities, they have to be strategic and effective with limited resources. Noting that without significant changes in funding, legislation, population growth, VMT, or increased enforcement and education, these trends will continue. Agencies are striving to be strategic in their approaches and more prioritizing of effective strategies that will reduce crashes - for example, concerted data analysis, project safety analysis and prioritization, and deployment of innovations and technologies. Further, the automotive industry alone, and transportation partnerships with them hold promises for future years' reductions in crashes and fatalities.

CDOT continues to work with the Metropolitan Planning Organizations (MPOs) to assist them in establishing their own safety performance targets, required by February 2022.

3. Strategic Transportation Safety Plan (STSP) – The 2020-2023 STSP update was issued in April2020. This updated plan sets a visionary goal of zero deaths and serious injuries so all people using any transportation mode arrive at their destination safely. The effort to update this planinvolved the engagement of hundreds of stakeholders across the state, in coordination with several other pertinent plans (Denver Regional Council of Governments [DRCOG] Vision Zero, Denver Vision Zero, and CDOT Statewide Plan). Implementation of the STSP strategies is anticipated to reduce the number and rate of fatalities and serious injuries in Colorado. The STSP Executive Committee has established a 15% reduction in fatalities and serious injuries as the performance target for the 2020 to 2023 period.

4. Highway Safety Improvement Program (HSIP) – In State Fiscal Year (FY) 2021, CDOT delivered $35.3 million in HSIP and state matching funding to the Regions and Local Agencies around the state for 59 projects to address fatal and serious injury crashes related to infrastructure and thedriver interaction (run off road, intersections, speed, and pedestrians). These projects have an estimated present value safety benefit of $110.3 million for an overall benefit cost ratio of 3.13.CDOT also has a state funded FASTER Safety Mitigation program that delivers approximately $70 million annually in safety improvement projects along the state highway system.

   Examples of safety improvement projects include roundabouts, intersection improvements, guardrail upgrades, pedestrian crossings, traffic signal upgrades, interchange ramp improvements, wrong way driving treatments, variable speed signing, and access improvements.The Branch and regions are currently programming State FY 2022 HSIP projects while compiling new projects for the State FY 2023 though FY 2026 plan.

5. Work Zone Safety and Mobility (WZSM) – The bi-annual WZSM Task Force issued its Process Review report to FHWA in April of 2020. The Task Force found that additional work is necessaryin the areas of training and Smarter Work Zones. Training focuses on creating a new course designed to educate all design and construction stakeholders on CDOT's procedures regarding work zone safety and mobility. This course is to be piloted in the spring of 2021. Smarter Work Zone strategies continue developing through partnerships with the Regions. Pilot projects havebeen completed and CDOT will soon create safety standards and specifications in reference to this technology.

   A break though has occurred within CDOT divisions and ITS's new data hub will allow the transition from data collected in the field to be uploaded and distributed to public feeds. This process will kick-off due to a recent FHWA grant awarded to CDOT's MOI division. The original scope of this grant will focus on maintenance TMAs, but the data feed created in this endeavor can be universally applied. This will help achieve our goal to upload data and provide real-time information to the travelling public. CDOT will continue to participate in the national USDOT Joint Program Office (JPO) through the (Work Zone Data Exchange) (WZDX).

   The Task Force has begun its new process to send survey questionnaires outto a much broader and larger audience. This has helped better define the Task Forces' efforts while also creating performance measurements for these efforts. CDOT has released a new procedural directive titled "*Traffic Control for Planned and Unplanned Work*." While COVID 19has hindered work zone traffic control reviews, CDOT Area Engineers made a plan to handle these reviews and unfortunately, not all proposed projects received a review this year. The Area Engineers still sent their required letter to FHWA, however with the information received.

6. Crash Data – In October 2021, the Branch has published a new public facing online crash data dashboard that is integrated with the state's Behavioral and Engineering Safety Data for Transportation (BESDT) database and application. This dashboard provides real time updates Colorado crash totals from 2010 to the most recent crash data received through the Departmentof Revenue (DOR).

   https://www.codot.gov/safety/traffic-safety

Over the next year, the BESDT database is anticipated to go through substantial updates so that the process of streamlining the data leads to improved accuracy, completeness, timeliness, uniformity, accessibility and integration. National Highway Traffic Safety Administration (NHTSA) 405(c) grant funding will be requested to support this effort.

The Branch has also worked closely with DOR regarding a number of issues with data sharing, data linkages, and various projects. CDOT and DOR have a new draft interagency agreement, which allows CDOT to share data more readily with the public as well as state, federal and local agency partners. With the removal of restrictions on location information and statewide data, CDOT is taking steps to publish dashboards and data to improve the visibility and availability of CDOT's crash dataset.

7. Rail Highway Grade Crossing Program – During FY 2021, CDOT apportioned Federal safety fundsto approximately 20 individual safety projects entailing improvements to at-grade highway crossings. The program is responsible for maintaining a database of all active public railroad crossings within the State of Colorado. CDOT has developed a data collection tool to allow for more accurate and consistent data collection efforts along with the creation of a geo-database to host the data. This tool incorporates CDOT's hazard index calculation as identified by staff.

   There are two Class I railroads: BNSF Railway and Union Pacific (UP) Railroad and there are no Class II railroads operating in Colorado. Additionally, there are 15 short-line railroads that provide local service with connections to the Class I railroads. Colorado has nine tourist railroad lines, which highlight Colorado's history and offer trips through Colorado's scenic outdoors. The two percent support funds used from the annual apportionment were utilized to maintain the inventory of all public railway-highway crossings in Colorado including the Hazard Index formula calculations.

   In addition to funding projects with both the BNSF and Union Pacific Railroad Companies, CDOT has safety projects with four Class III railroad companies this year. The Class III railroad companies are Durango & Silverton Narrow Gage Railroad, Great Western Railway of Colorado, San Luis Central Railroad, and San Luis & Rio Grand Railroad Company.

8. Colorado Safety Legislation and Statutes
   - Primary Seat Belt: Colorado does not have a primary seat-belt law.
   - Repeat Offender Law: Colorado is not in compliance.
   - Zero Tolerance Law: Colorado is in compliance.

9. Colorado Repeat Intoxicated Driver Requirements of 23 U.S.C. Section 164 – Due to changes in Colorado State Statutes, Colorado does not meet requirements of 23 U.S.C. Section 164 for mandatory minimum sentencing of imprisonment.

## PERFORMANCE MEASURES

The 2021 Colorado HSIP Report lists nearly all of the applicable safety performance measures are through FHWA's web reporting system, including the required FHWA and NHTSA national safety performance measures in FAST: fatalities, fatality rate, serious injuries, serious injury rate, and non-motorized fatalities and serious injuries.

https://safety.fhwa.dot.gov/hsip/reports/

Measures not specifically in the HSIP Annual Report and still pertinent to the StewardshipAgreement are listed below.

Table - Performance/ Compliance Measures (Traffic Safety and Engineering)

| PM# | Measure | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline | PastYears | 2020 Actual[1] |
|---|---|---|---|---|---|---|---|
| 336 | Reduce alcohol-related fatal crashes | Alcohol-related fatal crashes as a percentage of overall fatal crashes | Colorado Highway Safety Program Annual Report | Calendar Year | Less than45% | 2019: 223<br>2018: 227<br>2017: 254<br>2016: 249 | 247 |
| 376 | Reduce crash data processing time | Number of months crash data from crash to publication | Colorado Highway Safety Program Annual Report | Calendar Year | Less than 6 months | 2019: 15.6<br>2018: 9.7<br>2017: 13.0<br>2016: 11.2 | 2020 crash data is not published yet |

[1] Data is not official for a year after the end of the calendar year. Therefore, this is 2020 data and not 2021 data.

## KEY LEARNINGS

No key learnings were identified.

## NEXT STEPS

No next steps were identified.

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# 2.10 FINANCIAL MANAGEMENT

## INTRODUCTION

**CDOT Manager:** Bethany Nicholas

FHWA Manager: Andre Compton

The Financial Management Program encompasses the entire Federal-aid program from the authorization of a project through expenditure, billing, and final closure. This includes all phases (right of way, utilities, preliminary engineering, and construction) of a capital project as well as non-infrastructure projects such as planning and research. Oversight is performed at Headquarters, Regional business offices, and during project site visits to ensure eligibility of Federal-aid funds.

## QUALITY/RESULTS

- While the average number of days to close a project has increased, it is still belowthe Target of 365 days.
- CDOT continues to outperform the goal of less than 2% of its annual apportionment value being inactive at any given time. This value will need to be monitored as we goforward due to the higher amounts of federal funding being received in the IIJA.

## PERFORMANCE MEASURES

The following performance measures demonstrate the health of the Financial Management Program:

Table - Performance/Compliance Measures (Financial Management)

| PM # | Measure | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline | 2020 | 2021 |
|---|---|---|---|---|---|---|---|
| 1444 | Federal Funds Inactive Relative to Annual Apportionment | Federal funds inactive should be no more than 1-2%. 2% is the official FHWA target and 1% is the Colorado target. | PM | Federal FY | Less than 1% = Excellent Less than 2% = Good Greater than 2% = Poor | Q1:0.51%<br>Q2:0.40%<br>Q3:0.97%<br>Q4:0.71% | Q1: 0.9%<br>Q2: 0.6%<br>Q3: 0.4%<br>Q4: 0.6% |
| 1445 | Closure of federal aid projects (including non-construction in calendar days). | The average # of calendar days after the final federal expenditure/billing date to closure in Fiscal Management Information's Systems. | FMIS | Federal FY | Average not to exceed 365 days. | 201 Days | 235 Days |

## KEY LEARNINGS

FHWA has recently updated requirements regarding project closure in FMIS. Projects must close before 120 days after the FHWA Agreement End Date. CDOT will perform a review of practices for setting the End Dates to minimize the risk of passing 120 days. Additionally, CDOT will encourage timely End Date extension requests when justified.

As mentioned in the prior year's Next Steps section CDOT is implementing a process to close projects in FMIS once they are determined to be "shelved" meaning the project will not go to construction within the next several months after preconstruction phases have been completed. This process will reduce the number of inactive/languishing project.

The new federal Bipartisan Infrastructure Law is making several new grant opportunities for states and

partners to apply for. The Department in tandem with the Governor's Office of State Planning and Budgeting will closely monitor the grant opportunities and applications to be well positioned for success.

**NEXT STEPS**

CDOT's Office of Financial Management and Budgeting is analyzing and interpreting the new funding sources made available in the Bipartisan Infrastructure Law and will allocate those resources to applicable budgetary programs.

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# 2.11 MAINTENANCE AND OPERATIONS: HIGHWAY MAINTENANCE

## INTRODUCTION

**CDOT Manager:** Braporh (B.J.) Jacobs and Tyler Weldon (Alternate)

**FHWA Manager:** Shaun Cutting

CDOT has within its Central Office a Division of Maintenance and Operations (DMO), and Information Management Services (IMS) Unit. The Division of Maintenance and Operations has twoprimary functions:

- Providing policy and guidance for the state maintenance program; and
- Maintaining operational oversight for the administration of the maintenance program forthe eight maintenance sections and five traffic sections. The Division provides a liaison contact that assists and oversees the successful completion of the Methods of Operationsand Maintenance.

## QUALITY/RESULTS

The IMS Unit is responsible for overseeing the collection of performance data for the MLOS performance-based budgeting system. The sources for the performance data comes from various location including, but not limited to, Pavement Management, Staff Bridge, Night Inspection, and remote data collection. MLOS performance data is listed in the chart below:

Table - FY 2020 MPA Performance

| MPA | 2020 LOS Target | 2020 LOS Achieved | 2021 LOS Target | 2021 LOS Achieved |
|---|---|---|---|---|
| 100 - Planning, Training & Scheduling | N/A | N/A | N/A | N/A |
| 150 - Roadway Surface | B- | B+ | B | C+ |
| 200 - Roadside Facilities | B- | B+ | B- | A- |
| 250 - Roadside Appearance | B | C+ | B+ | B- |
| 300 - Traffic Services | B- | A- | B+ | D+ |
| 350 - Structure Maintenance | B- | B+ | A- | B+ |
| 400 - Snow and Ice Control | B | B | B+ | C- |
| 450 - Rest Areas, Buildings and Grounds | N/A | N/A | N/A | N/A |
| 500 - Tunnel Maintenance | N/A | N/A | N/A | N/A |
| Overall | B- | B | B | C- |

Maintenance was not able to meet its overall targeted Levels of Service (LOS). The Roadway Surface, Roadside Appearance, Traffic Services, Structure Maintenance and Snow and Ice MPAs targets were not met.

## PERFORMANCE/COMPLIANCE MEASURES

The following performance measures demonstrate the health of the Highway Maintenance Program:

Table - Performance/Compliance Measures (Highway Maintenance)

| PM # | Measure | Description | Reporting Mechanism | Reporting Frequency | Target / Baseline | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|
| 271 | Maintain the transportation system at the adopted annual MLOS grade | Annual MLOS adopted target grades for maintenance Program Areas 150, 200, 250, 300, and 350 | MLOS actual grades from annual survey | State FY | B- | B | B | B+ |
| 270 | Maintain the annual LOS snow mapping grade at the adopted annual grade | Annual LOS gradefor snow and ice removal | MLOS reporting | State FY | B | B | B- | B+ |

## KEY LEARNINGS

Colorado's statewide winter snowfall totals were in line with the average winter over the past 30 years. However, upon taking a deeper dive there were several record set for snowfall totals experienced throughout the state. The following cities ranked in the top 10 snowiest cities in the country. Boulder was #1, Lakewood was #3, Fort Collins was #6 and Denver was #7.

## NEXT STEPS

The I-70 corridor, from mile markers 205 to 213.5, is a highly used corridor that is vital to moving commerce and providing access to highly sought-after tourist locations in the state of Colorado. Due to the high Amount of Daily Traffic (ADT) along this corridor, especially during winter months, DMO developed a temporary solution called the Joint Operations Area (JOA) to address the unique challenges within this area during the winter months. Over the next few years, DMO will move to replace this temporary solution. As of fiscal year 2022, the JOA will no longer be in operation and DMO will move to develop a dedicated maintenance facility with staffing to meet the needs within this corridor.

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# 2.12 MAINTENANCE AND OPERATIONS: INTELLIGENT TRANSPORTATION SYSTEM (ITS)

## INTRODUCTION

**CDOT Manager:** Bob Fifer and Allie Axley (Alternate)

**FHWA Manager:** Eva LaDow

The overall purpose of the ITS/Technology program is to use innovative technology and strategies to enhance and improve operations of the transportation system by implementing advanced traveler information, advanced traffic and incident management, and other applications that improve mobility and safety of the system for all travelers. Over the last decade, rapidly changing technology has influenced the implementation of operational applications and how technology can be used to improve operational effectiveness. Advances in wireless communications, higher quality, and higher volume of transportation data (a.k.a. "Big Data"), traveler information, and smarter roadways have significantly improved the capability of ITS to impact operations on a greater level and at the same time the ability to deliver more sophisticated, focused, and real-time operational services. Some examples of these services and applications are: Adaptive Traffic Signal Control; Dynamic and Integrated Ramp Metering Access System Control; Advanced Traffic Management Systems; Advanced Traveler Information Systems; Active Traffic Management; Managed Lanes; Peak Period Shoulder Lanes; Variable Speed Limits (VSL); real-time video analytics cameras; weather stations; incident detection software; unmanned aerial systems; and others.

ITS is one of the primary, if not the foremost, transportation tools that can provide high levels of quantifiable and visible operational benefits on the entire transportation system more rapidly and at a lower cost than other traditional transportation applications, while providing a force multiplier on resource productivity. The goals are to improve safety, reduce traffic delays and congestion, and increase system reliability so that the transportation system can operate as effectively and efficiently as possible.

## QUALITY/RESULTS

To accomplish the elements identified above, the ITS Branch works with numerous stakeholders, both within and outside of the Department, to engage broad-based and representative participation. Working with these stakeholders the ITS Branch participated in the development and implementation of the Advanced Traffic Management System, Advanced Traveler Information System and Video Management System on September 29th, 2021. These systems were well over 18 years old and needed to be modernized to stay up with the advancement of systems and devices with data and predictive analytics. At the same time, we also moved our Data into a hybrid storage environment, meaning that some data resides within our Data Centers and some in the Cloud. We are focusing on stabilizing the Data Lake to start predictive analytics. The ITS Branch has also developed and is in the process of implementing performance measures to evaluate and quantify specific activities and applications to ensure optimum effectiveness and applicability to similar operational situations.

To ensure continuous success and improve the level of technical advancements within CDOT, in fiscal year 2019-20, ITS developed the Joint Process Review on the Systems Engineering Analysis (SEA). In fiscal year 2020-21, a charter was kicked off to address the timeliness, quality, and ownership of SEA documentation and deliverables. In September 2021, the official SEA Process was launched CDOT wide with success. We are currently tracking the progress and adoption of the new SEA process and sharing results with FHWA. In 2022, we will be kicking off the Colorado specific ITS Architecture.

We implemented a new Fiber Development Team that will focus on the MOBILE NOW Act, that FWHA adopted rules on 12/3/2021. This Team will focus on Public Private Partnerships and collaboration with broadband agencies and entities.

## PERFORMANCE/COMPLIANCE MEASURES

The following performance measures demonstrate the health of the ITS Program:

Table - Performance Measures (ITS)

| PM # | Measure | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline[1] |
|---|---|---|---|---|---|
| 1450 | TechnologyAvailability | Measure the uptime of critical technology and fiber backbone | ITS Work Plan Performance Measures | Calendar FY | TrackTrend |
| 1451 | Mean Time ToRestore (MTTR) | How long it takes to restore the technology | ITS Work Plan Performance Measures | Calendar FY **Semiannual reporting** | TrackTrend |
| 489 | vice Useful Life(UL) | Percentage of Useful Life of the technology | ITS Work Plan Performance Measures | Calendar FY | 90% |
| 1446 | SEA Completion | Percent of projects with an ITS element that have completed an SEA | SEA Tool | Calendar FY | TrackTrend |

[1] Data will not be available until 2022.

## KEY LEARNINGS

- How important clear expectations and documentation is for SEA processes and deliverables,
- The SEA and the ITS architecture cannot succeed without each other,
- Updating the ITS architecture will go hand in hand with the ATMS project, and
- Training is needed for Project Managers to be successful in implementing technology projects.
- The increase in reliance of technology, software, and data, has increased the demand on resources to maintain the infrastructure both virtually and physically.

## NEXT STEPS

The branch will begin a Colorado specific ITS Architecture in 2022. The ITS Architecture will be amajor element to gain consistency and uniformity on a complex system, ensure technology is implemented that is useful, cost effective and contributing to the mission of CDOT.

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# 2.13 MAINTENANCE AND OPERATIONS: REAL-TIME OPERATIONS

## INTRODUCTION

**CDOT Manager:** Ryan Tyler and Alternates: Patrick Chavez and Steven Gillespie

**FHWA Manager:** Eva LaDow

The Real-time Operations Services Branch is within the Division of Maintenance and Operations. The Real-time Operations Services Branch facilitates the Department's commitment to place a higher strategic emphasis on delivering statewide operations and to align and consolidate critical traffic incident, event, and regional operations functions with other traffic and traveler operational activities. The two primary program areas within this branch are the Statewide Operations Center and Traffic Incident Management (TIM) programs.

The Real-time Operation Services Branch directly oversees the Statewide Operation Center (Golden), and Statewide Program Management for the Operation Centers, and Traffic IncidentManagement programs. The other operation centers are located in Region 2 (Pueblo Headquarters), and Region 3 (Hanging Lake Tunnel).

## QUALITY/RESULTS

Not including the day-to-day operations work, some of the key program accomplishments in 2021 include:

Operation Centers Program:

- Operational Periods: All dispatch centers were provided resources to operate 24/7/365.
- CDOT Maintenance Dispatch: Completed statewide maintenance dispatch. Hanging Lake Tunnel dispatches for Sections 2, 3, and 6 (Western Slope). Pueblo dispatches Sections 4 and 7 (southern area). Golden dispatches for Sections 1, 5 and 9 (northeast, metro, and I-70 mountain corridor).
- Launched new OpenTMS system: In September 2021, CDOT launched a new Advanced Traffic Management System (OpenTMS), new Advanced Traffic Information System (ATIS), and Video Management System (VMS). These new systems propel operations with enhancedsituational awareness, efficient incident management, and public messaging abilities.
- Colorado Transportation Investment Office (previously HPTE): CDOT and CTIO continue to partner for the efficient operations regarding Express Lane operations, which includes shared space for operators at the Golden Operation Center.

Traffic Incident Management (TIM) Program:

- Supported Colorado First Responder Task Force: Strategic training (4DX) and guidance for 27 statewide TIM Teams.
- Held 5th Annual TIM Virtual Conference.
- Awarded new state Safety Patrol contract and finalized a new Safety Patrol Sponsorship agreement (Gieco).
- Increased numbers of Colorado first responders trained on SHRP2 TIM to over 61%.

## PERFORMANCE MEASURES

The following performance measure demonstrates the health of the Real-Time Operations Program:

Table - Performance Measures (Real-Time Operations)

| PM # | Measure | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline | Data |
|---|---|---|---|---|---|---|
| 815 | Interstate Level of Travel Time Reliability (LOTTR) | Percent of person-milestraveled on the Interstate that are reliable per federal requirements | Highway Performance Monitoring System (HPMS) | Calendar Year | National Performance Measure Targets: 2020: 81% 2022: 81% | 2021: 85.3% 2020: 91.55% 2019: 78.3% 2018: 78.2% 2017: 80.7% 2016: 81.0% |
| 816 | Non- Interstate NHS Level of Travel Time Reliability (LOTTR) | Percent of person-milestraveled on the Non- Interstate NHS that are reliable per federal requirements | Highway Performance Monitoring System (HPMS) | Calendar Year | National Performance Measure Targets: 2020: 64% 2022: 64% | 2021: 94.7% 2020: 94.3% 2019: 87.7% 2018: 86.5% 2017: 86.2% 2016: 64.3% |
| 386 | CDOT Safety Patrol Assists[1] | Measure the # of CDOT Safety Patrol Assists | ATMS Software | Calendar Year | Track trend | 2021: 38,712 2020: 36,590 2019: 30,187 2018: 29,452 2017: 30,071 |
| 665 | Non-CDOT Safety Patrol Assists[2] | Measure the # of non-CDOT Safety Patrol Assists on E-470 | E-470 Highway Group Data | Calendar Year | Track trend | 2021: 12,273 2020: 11,187 2019: N/A 2018: 12,920 |
| 666 | Hits for CDOT Traveler Tools | Measure the number of hits for CDOT traveler tools that customers have accessed on CoTripin order to identify trends to improve information consumptionby the public | Google Analytics CoTrip Site | Calendar Year | Track trend | 2021: 14,787,302 2020: 5,982,222 2019: 5,647,068 2018: 9,794,945 2017: 2,741,671 2016: 3,116,098 |
| 667 | Number of CDOT Push Notifications | Measure the number of CDOT communications pushed out (i.e., publicemail/text alerts) in order to identify trendsto improve information consumption by the public | 511 Data collection (Priorto 2019) CARS (2019 and after) | Calendar Year | Track trend | 2021: 27,946 2020: 19,549 2019: 23,633 2018: 15,66 2017: 18,035 2016: 18,251 |
| 1404 | Number of Lane Miles Covered by TIMS Coalitions[3] | In coordination with Department of Public Safety and Colorado State Patrol, increase the number of lane miles covered by TIM coalitions | TIM Website Coloradotim.org | State Fiscal Year | 2020: 8,928 | 2021: N/A 2020: N/A 2019: 8,796 2018: 5,846 |

[1] The CDOT Safety Patrol operates on selected routes such as: US 6, I-25, US 36, I-70, I-225 and C470 with varying coverage 7 days/week. The assists include, but are not limited to, the following services: protection and clearance of crashes, debris removal, and mechanical failure services (e.g., flat tire, fluid(s) transfer, jump-start). For 5 months this past year, there was expanded Safety Patrol coverage during the weekdays on the I-70 mountain corridor.

[2] The non-CDOT Safety Patrol includes the E-470 Highway Group's courtesy patrol, with operational periods and servicessimilar to CDOT's Safety Patrol. N/A means no data was received.

[3] This metric was discontinued as the goal was accomplished.

## KEY LEARNINGS

Operational Environment: With COVID policy, we saw reduced traffic volumes across the system. However, it also brought higher speeds, which led to more serious crashes per volume.

Procurement Strategy: A key learning this past year was that procurement strategy that encourages open competition leads to more effective operational coverage. This past year, the operation center operator supplemental contract, safety patrol contract, safety patrol sponsorship, and operation center systems were all recompeted. The result was higher quality services at a reduced cost. This has provided additional resources to focus on Colorado's real-time operational environment.

## NEXT STEPS

1. Continue to make improvements/enhancements to the Operation Centers systems tailored for Colorado. Specifically, continue to explore options to share information, including video feeds.
2. Continue to reinforce moving from a "Champion" based TIM program, to an "Institutionalized" program.
3. Continue to support all the TIM Teams, with an emphasis on the Metro TIM teams.

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# 2.14 TRANSPORTATION DEVELOPMENT: APPLIED RESEARCH AND INNOVATION

## INTRODUCTION

**CDOT Manager:** Stephen Cohn and David Reeves (Alternate)

**FHWA Manager:** Aaron Bustow

The Research Development and Technology Transfer Program at CDOT aims to conduct a program of high-quality, applied research, advancing solutions to the increasingly complex needs confronting Colorado's transportation future. The program strives to improve the quality of life and environment in Colorado by developing and deploying new or innovative methods, products, or materials in the planning, design, construction, and operation of transportation. The program also strives to monitor and disseminate relevant transportation research conducted by other states and the NCHRP. To meet these goals, research must be timely, relevant, and valid when applied to priority real-world problems, as well as cost-effective and accurately documented and disseminated. Knowledge and technology must be appropriately transferred to practitioners to be effectively used.

## QUALITY/RESULTS

Fourteen (14) research reports were published in State FY2021 (July 2020 – June 2021) (https://www.codot.gov/programs/research/pdfs). Of these, 11 result from ARIB investigations, 2 result from related research projects led outside ARIB, and 1 is a literature review report.

| | Report# | Title |
|---|---|---|
| ARIB Research Report | | |
| 1 | 2020-07 | Performance of a GRS-IBS Bridge Abutment: Colorado Case Study |
| 2 | 2020-09 | Residual Strength of Full-Depth Reclamation |
| 3 | 2020-10 | Construction and Design Soil Property Correlation |
| 4 | 2020-11 | Historic Streetcar Systems of Colorado |
| 5 | 2020-12 | Evaluating Effectiveness of Crash Type SPFs in Safety Management |
| 6 | 2020-13 | Synthesis report on the use and design of snow sheds to protect transportation corridors against avalanches |
| 7 | 2020-15 | Transportation of Hazardous Materials Through Eisenhower-Edwin C Johnson Memorial Tunnel - Executive Summary |
| 8 | 2020-16 | I-25 South Gap Work Zone Performance Measures Report |
| 9 | 2020-17 | I-25 South Gap Queue Warning System Evaluation |
| 10 | 2020-19 | Bridge Deck Repair Investigation and Quantity Estimation |
| 11 | 2021-01 | State Highway 9 Wildlife Mitigation Monitoring |
| Literature Report | | |
| 12 | 2021-06 | Autonomous Maintenance Technology Literature Review |
| Other Report | | |
| 13 | 2020-14 | US Highway 6 Wildlife Highway Mitigation Assessment |
| 14 | 2020-18 | Colorado Greenhouse Gas Pollution Reduction Roadmap |

## PERFORMANCE MEASURES

The following performance measures demonstrate the health of the Research Program:

Table - Performance/Compliance Measures (Research)

| PM # | Measure | Description | Reporting Mechanismm | Reporting Frequency | Target/ Baseline | 2019 Actual | 2020 Actual | 2021 Actual |
|---|---|---|---|---|---|---|---|---|
| 97 | Percent of recommendations implemented | Percent of recommendations implemented or adoptedwithin two years of finalresearch report, using 5 years of data<br><br>The research findings and recommendations will impact one or more of the following: improve design and construction methods, improve design and construction specifications, improve planning processes, impactmaintenance practice, update manuals, initiate new programs, and provide new technology | Research Work Planand Report | State FY | 35%-80% | 57% | 57% | 70%* |
| 412 | Number of projects completed on schedule | The number of projects completed in the fiscalyear on schedule | Research Work Planand Report | State FY | 10 | 9 | 7 | 11 |

## KEY LEARNINGS

ARIB adjusted the calculation methodology for PM # 97. In past years, projects where the implementation status is unknown were considered “not implemented”. We were not able to get feedback from the project Champion for 10 projects. This year, we excluded those projects from the calculation and will continue to pursue their status. Using the prior methodology, the PM # 97 value would be 58% rather than 70%.

ARIB staff are intimately involved in managing research projects to successful conclusions. Following a year of transition in personnel (FY20) with 3 departures and one vacancy filled, ARIB filled one more vacancy in FY21 and focused on catching up slowed or stalled projects and updating our management tools. The PM #412 outcome of eleven completed projects (as reflected in published reports) is respectable and does not include two reports from research managed outside the Branch, but which did include ARIB participation. These are items 13 and 14 in the above list.

ARIB is testing a more aggressive approach of Literature reviews to ensure research outside the state is considered when developing in-state research project plans. Reviews are conducted by a skilled contractor, and their results will be published as reports when appropriate. The first such published literature review is included in the above list as item 12.

ARIB is exploring changes to improve efficiency, stakeholder experience during the research cycle, and to become targeted toward research that is more impactful. As the branch tests and updates practices for research selection and for research management, Performance Measures should be monitored for unexpected changes.

## NEXT STEPS

- Continue to monitor and update the implementation status of completed research projects.
- Continue to encourage implementation of completed research by project Champions.
- Monitor use of the enhanced Literature Review capability.
- Continue to develop the Areas of Emphasis concept to ensure CDOT’s research portfolio addresses recognized priorities within the State.

# 2.15 TRANSPORTATION DEVELOPMENT: ASSET MANAGEMENT

## INTRODUCTION

**CDOT Managers:** William Johnson and Toby Manthey

**FHWA Manager:** Aaron Bustow

CDOT's Performance and Asset Management Branch (PAMB) coordinates with FHWA, the Department's asset-program managers, CDOT Regions, and other agencies to manage 12 asset classes. PAMB empowers CDOT's strategic planning and decision-making by providingtools to measure, analyze, forecast, and communicate to staff and transportation stakeholders the performance of asset programs and investment decisions.

The Department's 12 asset classes are pavement, bridges, culverts, walls, traffic signals, intelligent transportation systems, tunnels, geohazards, road equipment, buildings, rest areas, andmaintenance.

## QUALITY/RESULTS

CDOT in June 2019 published its Risk-Based Asset Management Plan Version 2.0 (RB-AMP 2.0), which describes the Department's current processes and plans for managing pavement and bridges, including those on the National Highway System (NHS). FHWA determined in August 2019 that the plan was consistent with requirements for asset management plans established by 23 U.S.C. 119 and 23 CFR part 515.

The 2019 plan was CDOT's third asset management plan, and the Department intends to publish its fourth plan in summer 2022.

The Department employs a multi-level organizational structure to support asset management. At the highest level, the Transportation Commission formulates general transportation policy and makes recommendations to the Governor and General Assembly on issues related to transportation policy and CDOT's budgets and programs. At the middle level, the Transportation Asset Management Oversight Committee includes the Executive Director, Deputy Director, Chief Engineer, Chief Financial Officer, Chief of Staff, Director of the Division of Transportation Development, the Director of Project Support, and all Regional Transportation Directors. This committee makes decisions on asset management strategy, goals, and objectives. A Working Committee includes headquarters-level asset managers. Finally, program developments are reported to Regional and Division staff in a regular briefing. The Working Committee and the Oversight Committee work together on the Risk-Based Asset Management Plan (RB-AMP), asset management implementation, and emerging issues.

The Department's infrastructure objective for all asset categories is "to preserve the transportation infrastructure condition to ensure safety and mobility at a least life cycle cost."

## PERFORMANCE MEASURES

The Department has developed statewide targets for "national performance measures" for pavements and bridges on the Interstate and National Highway System. This process has included working collaboratively with MPOs in support of their target-setting activities. CDOT plans to include new two- and four-year pavement and bridge targets for these metrics in the Department's 2022 asset management plan. CDOT also has long maintained internal metrics for all its asset classes, which are contained in the Department's Policy Directive 14. The Department continues to revise its budget setting process.

In addition, two new performance metrics for CDOT's Transportation Asset Management Plan (TAMP) are shown below.

| PM# | Measure | Description | Reporting Mechanism | Reporting Frequency | Target | Past Years | Actual |
|---|---|---|---|---|---|---|---|
| TBD | Certification of Transportation Asset Management Plan (TAMP) development processes | FHWA Certified TAMP development processes in effect? (Yes/No) | FHWA letter to CDOT (Certification Decision) | FHWA certifies processes every four years (or whenever TAMP development processes are amended) | Target: Certified TAMP processes in effect | 2020: Yes. (Certified TAMP processes in effect.) | 2021: Yes. (Certified TAMP processes in effect.) |
| TBD | TAMP Implementation Determination | FHWA determination of whether CDOT has *implemented* a TAMP consistent with 23 U.S.C. 119 and 23 CFR part 515. | FHWA letter to CDOT (Annual Consistency Determinationn) | Annual | Target: Positive determination of TAMP implementation | 2020: Yes. Successful implementation of TAMP consistent with 23 U.S.C. 119 and 23 CFR part 515. | 2020: Yes. Successful implementation of TAMP consistent with 23 U.S.C. 119 and 23 CFR part 515. |

## KEY LEARNINGS

The asset management program has spent the previous year refining certain asset models, including a model that forecasts pavement condition according to National Performance Measures. The program has been increasing documentation of its general policies. This included creating a new policy directive, PD 1609.0, in 2021.

## NEXT STEPS

CDOT will continue developing its new asset management plan over the first half of 2022. The Department continues to refine its asset models and how it tracks investment according to federally defined work types for pavement and bridges. These investments will be reported in an annual memo sent to FHWA for determining whether CDOT is managing its asset management program in accordance with the Department's asset management plan.

In addition, the asset management program in 2022 is developing planning budgets for state fiscal years 2025-26 and 2026-27.

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# 2.16 TRANSPORTATION DEVELOPMENT: ENVIRONMENT

## INTRODUCTION

**CDOT Manager:** Jane Hann and Brian Fauver (Alternate)

**FHWA Manager:** Stephanie Gibson

The FHWA/CDOT Environment program is focused on avoiding, minimizing, and mitigating potential adverse impacts of the transportation system on the people and the environment of Colorado in accordance with the National Environmental Protection Act (NEPA) and other applicable environmental legislation, regulations and policy direction. This is accomplished by ensuring:

1. Environmental issues are identified early;
2. Appropriate impact analyses are performed in a timely manner;
3. Adequate documentation is submitted and reviewed as scheduled;
4. Required authorizations are received from the governing entities for all projects and maintenance activities in accordance with the laws, environmental policies, letters of agreement and rules governing the environment; and
5. Mitigation tracking is conducted.

Timely compliance with environmental requirements is critical for advancing projects. The Regions, with assistance from the Project Development Branch and the Division of Transportation Development (DTD), are charged with the responsibility of project development, construction, and maintenance of the Colorado transportation system in a manner that will preserve the social and natural environment.

## QUALITY/RESULTS

1. Updates to Performance Tracking Measures
    - No Changes

2. Completion Time for Environmental Documents
    - The completion time for major environmental documents completed in 2021 is displayed in thetable below: **Table 1: NEPA and PEL Projects Completed in 2021**. Additionally, **Appendix B** contains all major NEPA projects that have occurred since 1999 and lists the length of time foreach project.

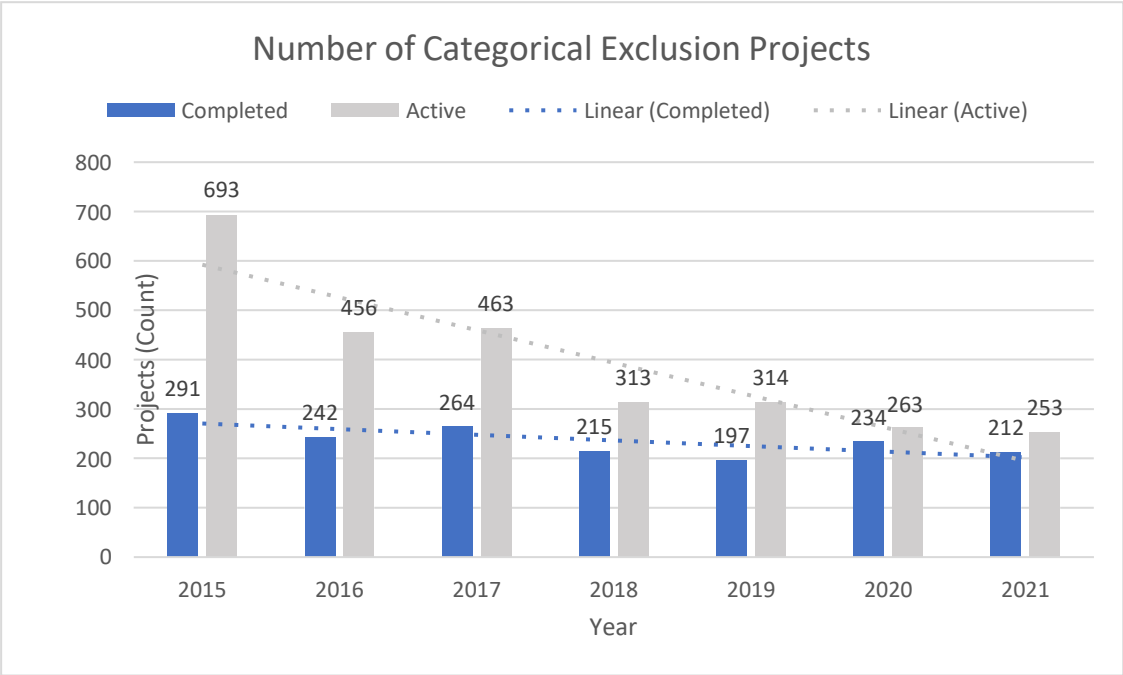
Table 1: NEPA & PEL Projects Completed in 2021

| Document Type | Title of Document | Time to Complete |
|---|---|---|
| PEL | 29 Road, Grand Junction | 33 months |
| PEL Average Completion Time | Includes data from 5 prior years | 20 months (average) |
| EIS Average Completion Time | No EISs were completed in 2021 so using the five years previous data for average calculation | 152 months (average) |
| Template EA | 88th Avenue: I-76 to SH 2 | 31 months |
| e EA Average CompletionTime | Includes data from 5 prior years | 31 months (average) |
| EA | I-70 West: Floyd Hill | 47 months |
| d EA Average CompletionTime | Includes data from 5 prior years | 67 months |

3. NEPA Workload
    - Each year, CDOT tracks the number of active and completed CatExs, EA/EISs and PELs. The following figures display the number of active and completed CatEx and Major NEPA Projects

(EA, EIS, and PEL) for a given year.

Figure 1. Number of Active and Completed Categorical Exclusions




During the 2021 calendar year, there were 212 CatExs completed. Thirteen of those were Non-Programmatic CatExs. This is approximately 22 less than the previous year. This is likely due to the slow project creation in 2020 due to the Covid 19 pandemic. RAMP funding contributed to the high level of active CatEx projects in 2013, 2014, and 2015. In addition to 212 completed CatExs, there were 253 active (federal and non-federal) NEPA projects of all levels statewide.

Figure 2. Environmental Documentation Workload – Number of EA/EIS/PEL Projects Worked On

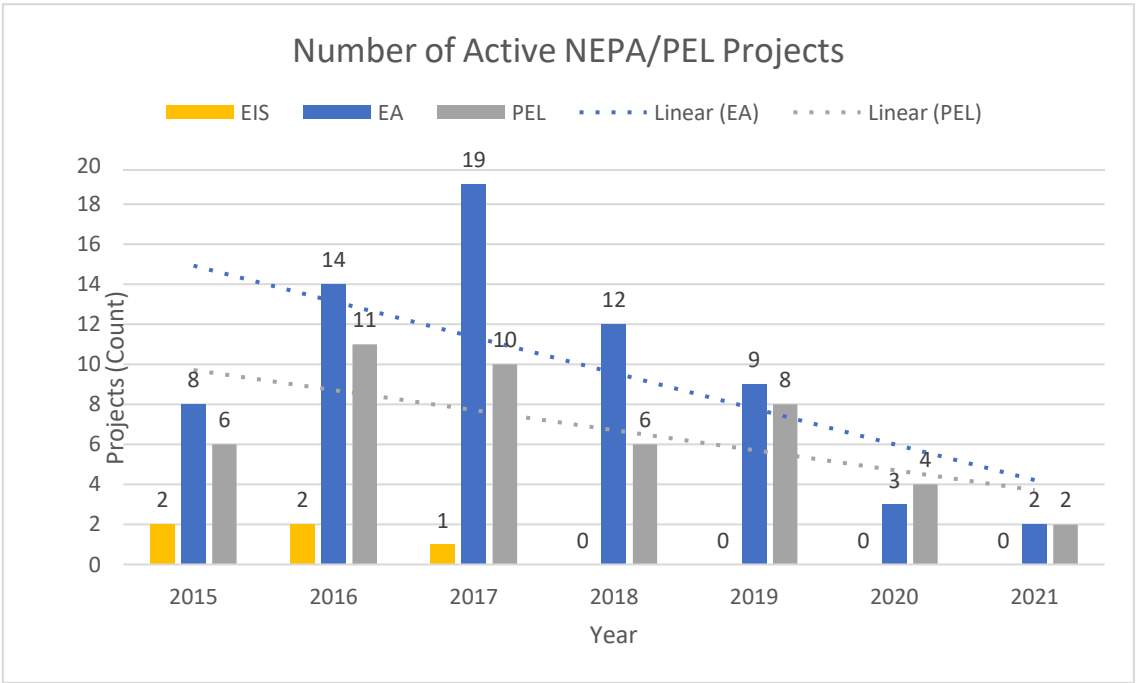


Figure 3. Environmental Documentation Workload – Number of EA/EIS/PEL Projects Completed

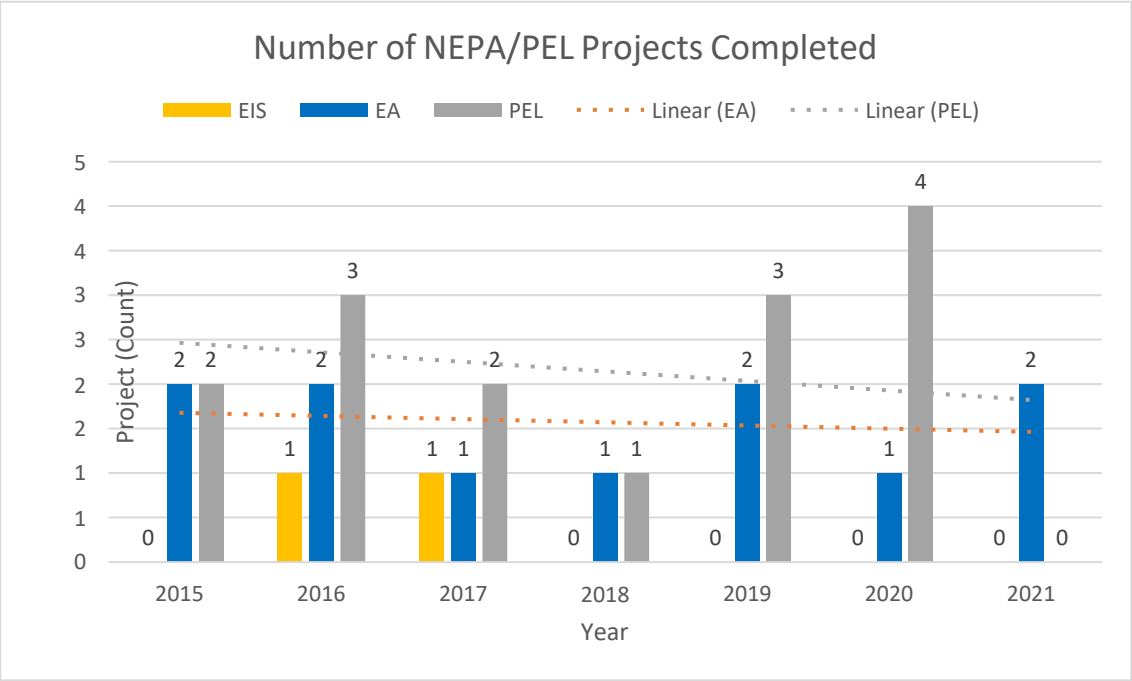
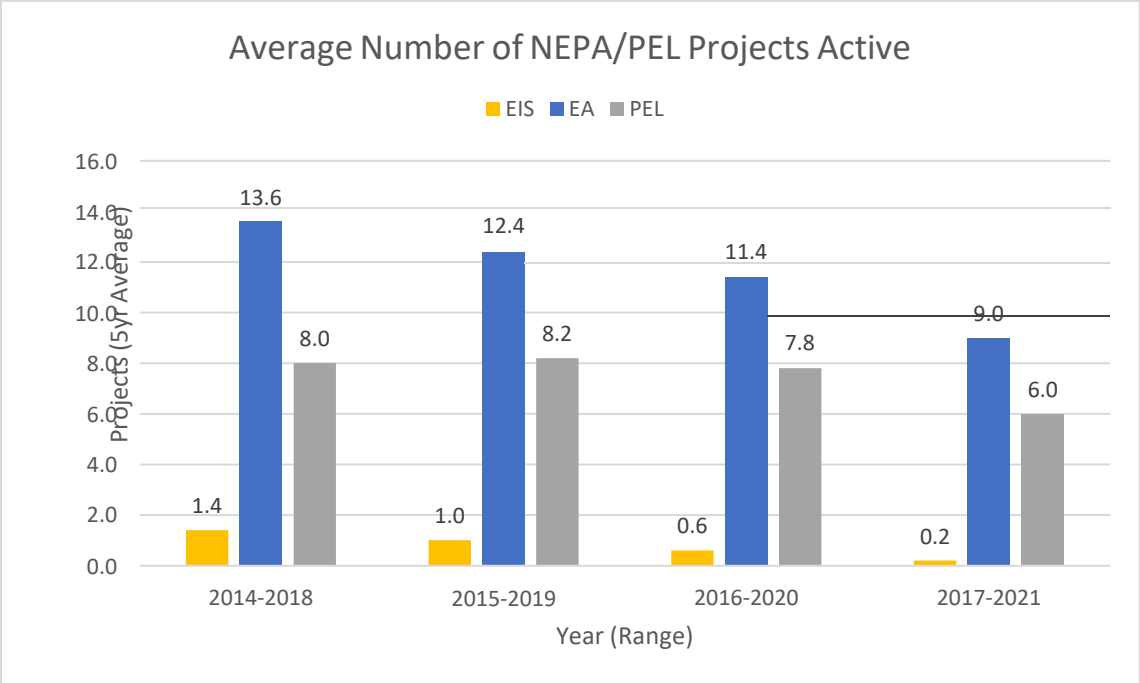



Figure 4. Environmental Documentation Workload – Five Year Average of EA/EIS/PEL Projects Worked On




**EIS/ROD**

No EIS documents were completed in 2021. No new EIS documents have been started since 2007. Part of this has to do with the Planning and Environmental Linkage (PEL) documents thatare being used at a corridor planning level instead of Tier 1 EISs. Tier 2 EISs that were active inthe past 5 years include the I-70 East.

**EA**

At the end of the 2021 calendar year, there was one active EA project – I-270: Widening from I-76 to I-70. Two EAs were completed – the 88th Avenue: I-76 to SH 2 and the I-70 West: Floyd Hill. There is a downward trend for both EA projects active and completed. The CatEx PA which was signed in 2021 allowed some projects that would previously been EAs to proceed as CatExs. Similarly, to the CatEx

graph, EA tracking showed an uptick of projects between 2014and 2017, which may skew the graph.

**PEL**
There were two active PEL studies at the end of 2021. This is a noticeable dip from years prior.This could be due to CDOTs focus on completing programmed projects in the 10-Year Plan. Thefive-year average has dropped from around eight active PEL studies for the past several years to six active PEL studies.

**Appendix A**: Environment Section, Other Notable Regulations and Accomplishments containsmore information on other accomplishments such as the timeline for when the NEPA Manual guidance was available, politics such as governors and their campaign platforms, and policiessuch as going after grants and partnerships that require NEPA documentation up front that could also affect the length of a NEPA document.

4. Water Quality Measure
   - Chronic through Recalcitrant findings are down, mostly because of the proactive approach by the 208.09 specification that has escalating liquidated damages, meaning, that when a contractor doesnot do a good job with erosion and sediment control on a construction project, the project is charged with the cost of increasing inspections and oversight taken on by CDOT. This has been effective in improving the stormwater erosion and sediment control performance of contractors onconstruction sites. An internal audit of our construction sites this past year have verified the finding of this improvement trend observed.

## Performance Measures

The following performance measures demonstrate the health of the Environment Program:

Table 2 - Performance/Compliance Measures (Environment)

| PM# | Measure | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline | 2021 Actual |
|---|---|---|---|---|---|---|
| 625 | Completion time for major environmental documents | Major environmental documents are defined as an EA, EIS, or PEL | A list of all EAs, EISs, and PELs completed in the calendar year, identifying the length of time along with a project descriptionas added to previous years' data | CalendarYear | Track trend | CDOT completed two EA documents, whichwere completed in31 and 47 months. No PEL documentsor EIS documents were completed this year. |
| 104, 381 382 | Active and completedNEPA documents | Projects that were active at any point in the year, and projects for which NEPA actions were completed | A list or table indicating number of active and completed NEPA documents in the calendar year divided by class of action (Categorical Exclusion [CE], EA, EIS) as added to previous years' data | CalendarYear | Track trend | In 2021, CDOT had 253 active NEPA projects of all levels and completed 212 Catex projects and two EAs. |

| PM# | Measure | Description | Reporting Mechanism | Reporting Frequency | Target/ Baseline | 2021 Actual |
|---|---|---|---|---|---|---|
| 99 | Water quality measure | Percentage of chronic, severe, chronic-severe, and recalcitrant construction stormwater inspection findings (for projects using 2019 specifications or newer) | Chief Engineer Objective | CalendarYear | 0% | In 2021, CDOT had 0.42% chronic, 0.08% severe, 0.0% chronic-severe, and 0.0% recalcitrant stormwater inspection findings. |

## KEY LEARNINGS

The environmental program continued to see workload and completion time for environmental documents as beneficial performance trackers. In 2021, CDOT had 253 active projects, and completed 212 CatEx projects, and 2 EAs.

In 2021 two state bills that affected the NEPA program were passed:

- Greenhouse Gas Pollution Reduction Roadmap (in response to HB19-1261) This roadmap required Colorado to reduce Greenhouse Gas emissions incrementally (26% by 2025, 50% by 2030, and 90% by 2050). Transportation was identified as the largest source of Greenhouse Gas pollution.
- Sustainability of the Transportation System (SB21-260): This bill created a new source of statefunding for transportation projects as well as outlining new Greenhouse Gas, Air Quality, and Environmental/Equity requirements for 'regionally significant projects.'

Several notable legislative and rulemaking changes happened in 2021 on the federal level. The Council on Environmental Quality (CEQ) is revising the rulemaking they published in July 2020. This is an iterative process – the CEQ is releasing revisions every few months. In October 2021, the CEQ released revisions which aimed to restore regulatory provisions that were changed in July 2020. This revision directed NEPA documents to analyze cumulative impacts once again, emphasize the importance of public involvement, and allow states to create higher environmental standards and requirements then federal ones. Additionally, the Infrastructure Investment and Jobs Act was adopted into law in November of 2021. This Act codified timelines and page limits for EAs and EISs, as well as securing a large amount of funding for infrastructure projects. The state level legislation and rulemaking changes are discussed in **Appendix A, Environmental Section: Other Notable Regulations and Accomplishments**.

## NEXT STEPS

The environmental program has outlined a goal for the upcoming year that will help with environmental review:

To aid in the federal dashboard and shorter EA and EIS timelines codified in the Infrastructure Investment and Jobs Act, CDOT is creating a class of action determination form. This will be filled out by environmental project managers prior to starting an EA. This will standardize EA start dates as later in the NEPA process, giving projects more opportunity to meet federal timeline requirements.

# 2.17 TRANSPORTATION DEVELOPMENT: TRANSPORTATION PLANNING

## INTRODUCTION

**CDOT Manager:** Marissa Gaughan, Erik Sabina, Darius Pakbaz

**FHWA Manager:** Bill Haas & Aaron Bustow

Three branches within the Division of Transportation Development (DTD) directly contribute to performance-based planning and programming as outlined in MAP-21 and the FAST Act: The Multimodal Planning Branch (MPB), the Information Management Branch (IMB), and the Performance and Asset Management Branch (PAMB). Other DTD branches include the Environmental Programs Branch (EPB) and Applied Research and Innovation Branch (ARIB).

## QUALITY/RESULTS

For the state fiscal year 2021, DTD has accomplished many of its objectives within its work program, including implementation of the statewide 10-year plan and regional partner transportation plans, transportation research, promulgation of rules related to greenhouse gas mitigation from the transportation sector, and highway network information projects. Additionally, the branch began the process of implementing the Freight Mobility and Safety Branch, as required under Colorado General Assembly Bill SB21-260.

Fiscal Year 2021 focused continued incorporation of national performance measures targets and data into its 10-year transportation plan, concluding with the completion of the "Appendix G: Performance Measures" section of the plan, publicly available on the Department's external website. Additionally, the Department now has increased transparency of its performance efforts, including new dashboards showcasing performance targets and current conditions, and its Accountability Dashboard, making publicly available information on the construction projects being implemented from its 10-Year Plan.

## PERFORMANCE MEASURES

The following performance measures demonstrate the health of the Planning Program:

Table - Performance/Compliance Measures (Planning)

| PM # | Measure | Description | Reporting Mechanism | Reporting Frequency | Target / Baseline | Past Years | 2021 Actual |
|---|---|---|---|---|---|---|---|
| **738** | Percentage of FY DTD Budget Expended and Encumbered by End of SFY | Percent of funds encumbered or expended compared to the estimate for the fiscal year | Feedback on annual review and tracking of percent complete on projects<br><br>Progress on the work program is in the FY Accomplishments Report | State FY | 70% of planned amount | 2020: 67.77%<br>2019: 79.64%<br>2018: 79.81% | **74.70%** |

| PM # | Measure | Description | Reporting Mechanism | Reporting Frequency | Target / Baseline | Past Years | 2021 Actual |
|---|---|---|---|---|---|---|---|
| **817** | Truck Travel Time Reliability (TTTR) Index | The sum of maximum TTTR for each reporting segment divided by the total Interstate system miles per federal requirements | Highway Performance Monitoring System (HPMS) | CalendarYear | National Performance Measure Targets: 2020: 1.5 2022: 1.5 | 2020: 1.42<br>2019: 1.45<br>2018: 1.38<br>2017: 1.37<br>2016: 1.68<br>2015: 1.51 | **1.39** |
| **818** | Peak Hours of Excessive Delay (PHED) | Annual hours of Peak Hour Excessive Delay (PHED) per capita for the Denver-Aurora Urbanized Areaper federal requirements | Highway Performance Monitoring System (HPMS) | CalendarYear | National Performance Measure Targets: 2020: 52 2022: 54 | 2020: 8.7<br>2019: 16.7<br>2018: 18.7<br>2017: 17.9<br>2016: 15.7<br>2015: 16.5<br>2014: 16.7 | **11.6** |
| **819** | Non-SOV Travel | Percent of Non-Single Occupancy Vehicle (SOV) Travel for the Denver-Aurora Urbanized Area per federal requirements | American Community Survey (UnitedStates Census Bureau) | CalendarYear | National Performance Measure Targets: 2020: 24% 2022: 25% | 2020: N/A[2]<br>2019: 24.7%<br>2018: 24.2%<br>2017: 24.1%<br>2016: 23.8% | **N/A[2]** |
| **820-823** | On-Road Mobile Source Emissions Reduction Benefit from CMAQ-funded Projects | Total Emissions Reduction Benefit per federal requirements from the following pollutants and precursors in kg/day: VOC, PM10, CO, & NOX | CMAQ Public Access System | Federal FY | National Performance Measure Targets: VOC 2020: 86 VOC 2022: 105 PM10 2020: 31 PM10 2022: 152 CO 2020: 1,152 CO 2022: 1,426 NOX 2020: 86 NOX 2022: 105 | 2020:<br>VOC – 37.44<br>CO – 702.37<br>NOx – 54.89<br>PM10 – 3.15<br><br>2019:<br>VOC – 87.48<br>CO – 542.66<br>NOx – 251.74<br>PM10 – 19.19<br><br>2018:<br>VOC – 100.09<br>CO – 1152.51<br>NOx – 289.63<br>PM10 – 34.13<br><br>2017:<br>VOC – 463.62<br>CO – 6720.58<br>NOx – 652.63<br>PM10 – 3.19 | **N/A[3]** |

[1]The HPMS Report Card is being replaced with a new system evaluate HPMS submissions nationwide

[2]American Community Survey data for 2020 will not be available until April 2022.

[3]2021 data not available until after the submission deadline in May 2021.

## KEY LEARNINGS

Key Learnings for the performance-based planning and programming program for the next year include, as part of the publication of the statewide long-range plan, updates on performance levels for the metrics required under the FAST Act should include breakdowns for performance levels within each of the five MPO's within the state. CDOT has included baseline data for the current statewide, 10-year plan, and future statewide plans and/or plan update will include updated performance levels to illustrate how implementation of the statewide plan is affecting these performance levels statewide and with MPO partners.

## NEXT STEPS

Next steps for the performance-based planning and programing program for the next year include:

Continued implementation of the provisions of SB21-260, including the development of the Freight Mobility and Safety branch, including hiring a branch manager, incorporation of the Oversize/Overweight permits office, and hiring other key staff.

Begin processes for analyzing data related to national performance measures in the infrastructure condition and system reliability goal areas. This will allow CDOT to set new targets for all measures in these two goal areas by the deadline on October 1, 2022.

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# 2.18 TRANSPORTATION DEVELOPMENT: OFFICE OF INNOVATIVE MOBILITY

## INTRODUCTION

**CDOT Manager:** Lisa Streisfeld and Michael King (Alternate)
**FHWA Manager:** Bill Haas

The Office of Innovative Mobility is dedicated to reducing pollution in our air and congestion on our road by expanding multimodal transportation options and using traditional and emerging technologies. The Office of Innovative Mobility includes four divisions, each of which collaborates with internal and external stakeholders to advance its mission. The electrification and energy team works closely with the Colorado Energy Office and Colorado Department of Public Health & Environment to promote zero emission vehicle and infrastructure deployments for light, medium, and heavy-duty vehicles. The mobility technology team oversees connected and autonomous vehicle efforts that improve safety and expand mobility options with a focus on overarching policy and strategic investments that are preparing CDOT for the future of this emerging field. In addition, the mobility services group is exploring efforts to better utilize new mobility services such as ride hailing, e-commerce, and shared mobility to provide more options for all Coloradans, including vulnerable populations with specialized transportation needs as well as promoting innovation in traditional transportation demand management (TDM) strategies. The Office also includes the Division of Transit and Rail, which administers millions of dollars of State and Federal transit dollars, plans for, and constructs transit infrastructure and mobility hubs, awards transit grants to local governments and transit operators, and operates the Bustang family of services, a statewide interregional transit service.

## QUALITY/RESULTS

The Office of Innovative Mobility ensures quality control and assurance by developing an annual work plan and reports regularly to CDOT executive leadership and the Transportation Commission on the status of the various initiatives, performance metrics, and expenditures.

## PERFORMANCE MEASURES

The following performance measures will help assess the health of the Innovative Mobility Program. New performance measures have been added for the TDM Grant Program and several others under the Mobility Technology Division.

Table - Performance Measures (Innovative Mobility)

| PM# | Measure | Description | Reporting Mechanism | Reporting Frequency | Target / Baseline | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|
| - | CanDo Telework | Total funds awarded for the CanDo Telework | Grantees provide project end report | CalendarYear | Expend $176k funds | N/A | $123.8K | $116.7K |
| - | Revitalizing Main Streets Initiative | Total funds awarded for the Revitalizing Main Streets Initiative | Grantees provide project end report | CalendarYear | Expend $6.1 million funds | N/A | $2.84M | $28.4M |
| | TDM Grants | Total funds awarded for the Transportation Demand Management Grant program | Grantees provide quarterly reports, project end report | Quarterly | Expend $960,000 funds | N/A | N/A | $1.01M |
| - | f ZEV BusGrants Awarded Through VW Settlement | Number of EV Buses awarded through VW Settlement | VW Settlement Transit Program Grant Tracking | CalendarYear | Expend full $30.6 million allocation | $13.3M | $16.2M | $21.9M |

| PM# | Measure | Description | Reporting Mechanism | Reporting Frequency | Target / Baseline | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|
| - | **Total EV registrationsin Colorado** | **Cumulative total number of EV registrations in Colorado** | **EValuateCO dashboard** | **Monthly** | **940,000 by FY2030** | **19,256** | **32,730** | **49,272** |
| - | Total zero-emission transit vehicles in Colorado | Cumulative amount of zero-emission transit vehicles in Colorado | EValuateCO dashboard | Monthly | 1,000 by FY2030 | 23 | 54 | 61 |
| - | Percentage of total state highway miles within a 30-mile buffer of a publicly-accessible DC fast-charging station | The percentage of total state highway miles within a 30-mile buffer of a publicly-accessible DC fast-charging station | Charge Ahead Colorado Grants Tracking | Monthly | 100% by FY2030 | 40% | 46% | 63% |
| - | Number of Colorado Scenic & Historic Byways that are classifiedas Electric Byways | The number of Colorado Scenic & Historic Byways that are classified as Electric Byways | Charge Ahead Colorado Grants Tracking | Monthly | 26 (100%) by FY2025 | 3 | 3 | 8 |
| | Total CDOT Connected Vehicles (CV) | Number of CDOT vehicles equipped with CV technology and/or vehicles contributing data to CDOT's Data Lake | Mobility Technology Program Tracking | Quarterly | | NA | NA | 84 |
| | Total CV roadside units (RSU) on the CDOT transportation network | Number of deployed CV RSUs | Mobility Technology Program Tracking | Quarterly | | 132 | 132 | 161 |
| | Total CV data collected from the Roadside Units (RSUs) | Basic safety messages (BSM) generated by CDOT's CV data and other vehicle data contributed to CDOT's Data Lake | RSU Manager | Quarterly | | NA | NA | 22,241,099 |
| | Total autonomous truck mounted attenuator (ATMA) miles | Number of miles driven in autonomous mode by CDOT's autonomous truck mounted attenuator (ATMA) | Mobility Technology/DMO Program Tracking | Quarterly | | 40 | 22 | 26 |

| PM# | Measure | Description | Reporting Mechanism | Reporting Frequency | Target / Baseline | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|
| | Creation of work zone data exchange (WZDx) data feed Work Zone Data Exchange Project | Creation of the USDOT WZDx specification data feed | Public availability of the feeds | Annually | | NA | NA | Feed is not publicly available (under development and should be available in Calendar Year 2022) |

## KEY LEARNINGS

OIM has many successful program areas and is using a combination of federal grants, state funds and VW Settlement funds to make an impact throughout the state. The federal BUILD Grant enhanced the OIM Technology program in 2021. Funds were used for installation of fiber optic lines on I-25 and I-76. These will provide the infrastructure to support connected vehicle communication in the future. The TDM grants, mobility hub construction, Connected Colorado mobile trip planning and ticketing platform and zero emission bus planning and capital awards are progressing as scheduled, with more funds to be expended in future years. Educational efforts for the Office included hosting a TDM Conference in November 2021, and training to CDOT first responders regarding special electric vehicle needs when involved in traffic incident management.

## NEXT STEPS

While there has been much progress on vehicle electrification, including multiple new monthly records for new EV registrations in the last quarter of 2021, there is still work to be done to reach our goals for Electrified Scenic Byways, transit vehicle deployments, and state highway coverage. In 2022, CDOT staff across OIM, the Division of Transit & Rail, and other divisions will also establish the new Clean Transit Enterprise to further advance these efforts. In addition, the Office will continue to work with partner agencies and stakeholders on the Colorado Clean Truck Strategy to tackle medium and heavy-duty vehicle emissions, including preparing studies in calendar year 2022 on planning for medium and heavy-duty zero emission vehicle infrastructure and improved freight operations to reduce congestion and greenhouse gas emissions. The Electrification program will also create a new curriculum for electric vehicle maintenance as part of work force development. The Mobility Technology program will install additional fiber and roadside units to support connected vehicle communication and continue to make progress on the Work Zone Data Exchange project to improve safety. Lastly, the Mobility Services program is working towards the advancement of strategic TDM measures, including a pilot project to install micro mobility in one of Colorado State Parks.

Listed below are some potential performance metric options that are being considered by OIM for FY 22-23:

- Bustang - Advanced Driver Assistance Systems
- Statewide micro mobility trips
- VMT reduction through TDM Measures
- Number of park and ride lots and spaces

# SECTION 3. RISK RESPONSE STRATEGIES

## Overview of the Risk Response Process

One of the most important roles of the Quality Improvement Council (QIC) is evaluating and seeking improvements to existing Federal-Aid Highway Program (FAHP) related processes. By focusing on continual improvement, CDOT and FHWA can achieve strategic goals, better meet customer's needs and expectations, lead systemic improvement, assist with the deployment ofinnovative technologies, and provide a more focused technical assistance.

Each year, the QIC compiles a list of risks to implementing the FAHP, as well as opportunities to improve results or streamline processes. CDOT and FHWA leads explore the risks and make recommendations on how to address them.

The QIC prioritizes which risks and opportunities to focus on based on the potential impact, likelihood, and resources available. In September of 2021, the QIC used a weighted priority matrix to better inform the selection of the three JPRs. The decision criteria included: safety, alignment with CDOT strategic goals, cost savings (efficiency of delivery), risk to funding, within CDOT control,and support from CDOT's Executive Management Team and FHWA. Based on the weighted scores and several facilitated workshop meetings, the QIC selected three Joint Process Reviews (JPR) for the upcoming Federal Fiscal Year 2021-22.

Each JPR team subsequently developed a standard CDOT project charter to clearly communicatethe purpose, sponsors, stakeholders, resources, data, deliverables, measures, and work plan. In addition, the QIC uses an online JPR tracker for open JPRs, to be updated by project leads & reviewed at least quarterly, if not monthly, during QIC meetings.

As JPR are closed, the JPR lead develops a final report that summarizes: 1) overview of risk; 2) general methodology (including project team); 3) key findings; and 4) specific recommendations for implementation. Final reports and are added to the QIC ProjectWise Process Review Library.

The remainder of this section includes:

- Joint Process Reviews (JPRs) selected for Federal Fiscal Year (FFY) 2021-22.
- JPRs still being implemented FFY 2017 through FFY 2020

## Joint Process Reviews (JPRs) selected for Federal Fiscal Year (FFY) 2021-2022

### Incorporate Lean Process Improvement, Project Management and Change Management into all JPRs

**Problem Addressed:** Quicker implementation and overall success of JPRs

**Approach:** Use CDOT's Lean continuous process improvement methodology to streamline theJPR process, use CDOT's project management process and support from CDOT's process improvement team and change management team to successfully, and more efficiently, implement and track JPRs.

**Contacts:** CDOT: Michelle Malloy & Gary Vansuch| FHWA: Elizabeth Kramer

Improve Interstate System Conditions through the Highway Performance Monitoring System (HPMS)

**Problem Addressed:** If CDOT does not improve the interstate system conditions there is a risk to funding.

**Approach:** The approach will be developed by Spring 2022, leveraging input from a variety of stakeholders with interests in the HPMS.

**Contacts:** CDOT: Craig Wieden| FHWA: Brian Dobling

Improve Buy America Compliance

**Problem Addressed:** CDOT and FHWA are encountering challenges related to regulations related to Buy American, especially steel. Failing to maintain compliance puts a significant amount of federal funding at risk for CDOT.

**Approach:** Review specifications on relevant materials used in recent projects, verify if a Buy America issue exists. If not, file a final report. If an issue exists, make recommendations to address and develop a project to implement those recommendations.

**Contacts:** CDOT: Chris Horn & Craig Wieden| FHWA: Brian Dobling & Ed Trujillo

## JPRs Still Being Implemented (2017-2020)

Highway Performance Monitoring System (HPMS) Data Review (FFY 2017-2018)

**Problem Addressed:** CDOT should include Local Agency construction project information in federally required reporting and provides a starting point for tracking prompt payment discrepancies identified in Local Agency projects.

**Approach:** Make the use of B2GNow software required for all Local Agency construction projects that go out to advertisement after July 1, 2022, to ensure successful system implementation existing CDOT specifications and contract documents can be thoroughly reviewed (and updated if appropriate). In addition, develop robust training materials to provide to Local Agency project personnel and contracting community.

**Contacts:** CDOT: Phyllis Snider | FHWA: Aaron Bustow

Subcontractor Prompt Payment Processes (FFY 2018-2019)

**Problem Addressed:** CDOT Local Agency construction contracts are still operating on a "complaint-based" reporting process to identify prompt payment issues.

**Approach:** CDOT will shift to a proactive monitoring process via implementation of B2G on these projects (all other CDOT contracts are using B2G now) by July 1, 2022. This improvement will allow CDOT to include Local Agency construction project information in federally required reporting and provides a starting point for tracking prompt payment discrepancies identified in Local Agency projects.

**Contacts:** CDOT: Greg Diehl and Steve Harelson | FHWA: Nicole Bumpers

Improve Project Specific Safety Recommendations in the Operations Evaluation (FFY 2019-2020)
**Problem Addressed:** Currently at CDOT, each Region has the discretion to conduct the Safety Analysis on projects independently. This has resulted in different levels of analysis and recommendations that may not sufficiently address potential safety issues that exist along the state highway system. There is a need to improve data-driven safety analysis consistency for 3R projects so that safety issues and the supporting budgets can be identified for implementation of systemic safety improvements (signage, striping, guardrail, rumble strips, etc.) leading to greater overall crash reduction statewide.

**Approach:** CDOT HQ is coordinating with Regions (traffic and materials) to have advanced listing of 3R projects available so that level of safety analysis (level 1 or level 2) can be determined ahead of time and possibly explore having safety assessment reports completed in advance as well. HQ hosting safety analysis training workshop for region traffic groups in 2021.

**Contacts:** CDOT: David Swenka, Steve Harelson, Neil Lacey, and Craig Wieden | FHWA: Shaun Cutting, Dahir Egal, and Armando Henriquez

Construction Contract Management of Complex Alternative Delivery Projects (CM/GC and Design-Build)(FFY 2019-2020)
**Problem Addressed:** CDOT's recent experience on complex projects has been challenging, each has been administered differently, has taken a unique approach to managing risk, and there lacks a clear approach toward successful completions of the projects. There have been few examples of consistent resources being dedicated to the delivery of these types of projects as well as consistency of resources carrying on through the lifecycle of the project creating a loss of institutional knowledge of the contract. The large investment and extraordinary impact on the traveling public puts these projects in the political and public spotlight. Additionally, private investment is being used to fund these projects; missed milestones could erode CDOT/FHWA's credibility and degrade our future investment grade.

**Approach:** An initial investigation into the causality of the issues on complex projects would be revealing, and once the cause is apparent, we can then move into solutions that include developing an administration process that allows CDOT to hold Contractors accountable to ensure compliance with the technical requirements. For QIC purposes, the final JPR report to include findings from this discovery phase and recommended areas to focus on in the future. The JPR report to contain findings and recommendations related to problem solving on a specific component (i.e., phase 2).

**Contacts:** CDOT: Matthew Pacheco and Keith Stefanik| FHWA: Shaun Cutting

Improve the Quality of Construction of Bridge and Structural Assets (FFY 2020-2021)
**Problem to Address:** The statewide construction quality of our bridges (Major Structures) needs to be improved to ensure efficiency in project budgets, improve the safety of the structures for the project delivery team and public users, and ensure integrity in the performance and condition over the 75 to 100 years expected life of the structures.

**Approach:** In November 2020, the project team developed the project charter to better understand the specific and systemic problems that result in construction issues and require special load tests or multiple revisits. The JPR team identified three focus areas: 1) Create a tracking system to identify resource gaps and common problematic project delivery milestones. 2) Increase resource support and time involved for QA on bridge delivery; 3) Create a training that will be distributed to the regional member involved with Bridge delivery.

**Contacts:** CDOT: Michael Collins and Keith Stefanik | FHWA: Spencer Tucker

Improve Timely & Transparent Reporting for CDOT HSIP (including local agency) Projects' Obligationsand Expenditures (FFY 2020-2021)

Improvement Program, (HSIP) projects' (including local agency projects) obligations and expenditures results in misunderstanding and misrepresentation of CDOT's standing among states in the program.

**Problem to Address:** Lack of timely & transparent reporting for CDOT Highway Safety

**Approach:** In November 2020, a project charter was developed, and the team identified to work on this project. The project will improve reporting and the percentage obligation rates (trending in the right direction) to show improving HSIP program effectiveness compared to other states. OFMB has created a new HSIP report that details the status of HSIP funding that has been programmed but not obligated as well as the STIP status. This is a monthly report that is then summarized and provided to FHWA. The report has been generated for the first three months of 2021 and FHWA has been provided a contextualized update. As of March 2021, the project is approximately 50 percent complete.

**Contacts:** CDOT: David Swenka and Keith Stefanik | FHWA: Bill Haas and Dahir Egal

Improve Performance Levels for Off-System (locally owned) NHS Bridges and Pavement (FFY 2020-2021)

**Problem to Address:** CDOT is measured on the performance of NHS off-system pavement and bridge, but has no direct control over those projects, just the ability to make recommendations while the SHC makes the final decision. Exceeding the statewide bridge target of 10% in poor condition would limit flexibility of future spending, as the FHWA would make decisions with less CDOT input. This could result in lost funding based on a formula (amount TBD).

**Approach:** In November 2020, a project charter was developed and a team to work on this project identified. It was noted that CDOT does not have authority over locally owned and therefore the results of this project will need to be within CDOT's control/authority.

**Contacts:** CDOT: William Johnson | FHWA: Brian Dobling and Spencer Tucker

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# SECTION 4. ADDITIONAL ACCOMPLISHMENTS INFORMATION

## 4.1 EVERYDAY COUNTS ACCOMPLISHMENTS

CDOT Contact: Gary Vansuch and Michelle Malloy

Every Day Counts (EDC) is a Federal Highway Administration program that works in partnership with the American Association of State Highway and Transportation Officials, State Department of Transportations, and other transportation stakeholders to foster a culture of innovation. Through this State-based effort, the goal is to facilitate rapid deployment of proven strategies and technologies to shorten the project delivery process,enhance roadway safety, reduce congestion, and improve environmental outcomes.

Every 2 years, FHWA works with State departments of transportation, local governments,tribes, private industry, and other stakeholders to identify a new set of innovative technologies and practices that merit widespread deployment through EDC. The selectedinnovations share common goals of shortening project delivery, enhancing the safety anddurability of roads and bridges, cutting traffic congestion, and improving environmental sustainability.

EDC, Round 5 (EDC-5) - CDOT and the FHWA CO Division were active participants in EDCround five (EDC-5), which promoted the adoption of the following 10 innovations in 2019and 2020. See https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/ for more.

1. Advanced Geotechnical Methods in Exploration (A-GaME)
2. Collaborative Hydraulics: Advancing to the Next Generation of Engineering (CHANGE)
3. Project Bundling
4. Reducing Rural Roadway Departures
5. Safe Transportation for Every Pedestrian (STEP)
6. Unmanned Aerial Systems (UAS)
7. Crowdsourcing for Operations
8. Value Capture: Capitalizing on the Value Created by Transportation
9. Virtual Public Involvement
10. Weather-Responsive Management Strategies

Through this participation, CDOT can receive or has received federal funding for peer exchanges, technical workshops, scan tours, and discretionary program awards including assistance through the Statewide Transportation Innovation Council (STIC), Technology Transfer (T2) and the Accelerated Innovation Deployment (AID) program.

Prior to EDC-5, CDOT opted into a small number of EDC-4 Innovations. During EDC-5, CDOT opted in to nine of the ten EDC-5 Innovations listed above. The following summaries outline achievements made by CDOT, FHWA and other transportation partners towards institutionalizing these innovations:

1. **Advanced Geotechnical Methods in Exploration – A-GaME**
https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/geotech_methods.cfm

**CDOT Champion:** David Thomas

The Colorado DOT Soils & Geotechnical Services have incorporated CPT and geophysicalmethods into its manual of practice as well as using each technology on one or more projects.

**Lessons Learned:** The only obstacle is money and education. Is there money to use these technologies and is there time to educate project managers on the benefits of using them?

2. **Collaborative Hydraulics: Advancing to the Next Generation of Engineering (CHANGE)**
https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/change2.cfm

**CDOT Champion:** Brian Varrella

- 2019 & 2020 authorized the use of 2D hydraulic analyses on projects, permits and planning studies statewide with the update to the CDOT Drainage Design Manual (DDM) in Chapters 8 and17.
- 2019 & 2020 -- CDOT personnel from Region 4 (northeast quarter of CO) participating on the Colorado 2D Collaborative (C2DC) with FEMA Region VIII, FHWA, other state agencies, and private sector partners to provide guidance to FEMA Headquarters on utilizing 2D hydraulic studies in regulatory floodplain permit and revision processes associated with requirements ofthe National Flood Insurance Program (NFIP) standards published in Title 44 of the Code of Federal Regulations.
- 04/2020 -- hired an Engineer in Training (EIT) to support a 2D analysis Quick Checks initiativestatewide with SMS & SRH-2D on up to 50 infrastructure asset sites statewide.
- Project Sponsoring by CDOT Chief Engineer and Region 4 Transportation Director.
- EIT will provide Project Management support at 0.5-FTEs in CY2020 & 2021 as a subject
- 05/2020 -- received combined funding of $347,000 to implement a 2D analysis Quick Checksinitiative statewide with SMS & SRH-2D on up to 50 infrastructure sites statewide.
- 05/2020 -- documented up to 90 2D models completed statewide from 01/2016 through 05/2019 on infrastructure projects across Colorado; more than half from CDOT Region 4 (northeast quarter of CO).
- 06/02/2020 -- secured a prime contractor and 5 contractors to create a task order of $250,000to complete 50 projects in 12 months.
- 06/04/2020 -- completed a report template with assistance from private sector partner RS&Hfor succinct quick check reporting.
- 06/05/2020 -- confirmed 19 of 50 projects are ready to start 2D Quick Checks, with 7 morepossible and 15 under investigation. Projects still arriving to Project Champion & Project Manager though March 2021.
- 07/15/2020 – 2d Quick Checks (2dQC) Project receives Notice To Proceed and work begins onproject selection and initiation.
- 12/09/2020 – TAC meeting reveals 45 of 76 projects are moving forward.
- The need for 2dQC exceeds capacity statewide.
- Also received funding to develop statewide training and support program in CY2021.
- 12/29/2020 – EOC meeting authorizes sharing of 2dQC with other State DOTs and FHWA partners.
- Also authorized 3-Tiered support system.
- EOC requests establishment of a 2dQC Statewide Selection Panel; framework to be developedin CY2021 for further vetting.

**Lessons Learned:** EDC-5 Project Leader Varrella is available to assist other states with lessons learned and provided material evidence of successes to the FHWA Resource Center for distribution to 6 state and 2 federal partners, including the following materials:

- Colorado DOT Upper Management, Program Engineers, and Resident Engineers are enthusiastic supporters of the concept across the state; the 18-month Awareness campaign was highly successful using a team-based strategy supported by the Office of Process Improvement, including the following tactical decisions and outcomes:
- Roadshow of 2D successes in CDOT Region 4 and lessons learned on real projects.
- Preparation of a 1-Page Success Stories to succinctly document challenges,solutions and outcomes applying 2D technology to project delivery.
- Development of a Frequently Asked Questions (FAQs) summary from constructive feedback, questions from Road Shows, and gaps identified by Upper Management.
- Modifications to the CDOT Drainage Design Manual (DDM) were delivered to a public website in September 2019 but warrant further editing, peer-review, policyupdates, and internal discussion before material can be effectively applied statewide. Internal talks

are ongoing.

- Rollout of a statewide process requires at least 0.5-FTEs of support over a period of 2-3 years to effect change in process, as indicated by current progress at Colorado DOT. It is expected other state DOTs can accelerate this progress basedon the Summary of Conclusions and Recommendations from final 2D Quick Check Initiative Reporting available in Q3 of CY 2021.
- A statewide panel of SMEs for 2dQC is necessary for long-term viability andsurvivability
- Panel must meet quarterly or monthly to review statewide 10-year pipeline ofprojects and earmark opportunities for Regional action.
- Supervisory support needed for SMEs.
- All Panel SMEs must take CDOT training developed in CY2021 and refined overtime.
- Current need of 77 projects exceeds 45 project capacity in CY2021
- Next projects will be moved to Statewide 2dQC SME Panel, or CDOT will explore aPhase 2 effort to build on the current project delivery effort (Project 23532) or onthe Research effort (Project 24149).
- CDOT Executive Management re-iterated the 2dQC Initiative has full support for expanding to a statewide process in CY2021 to be maintained in perpetuity.

3. **Project Bundling**
   https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/project_bundling.cfm

   **CDOT Champion:** Matt Pacheco and (prior to departing CDOT), Ermias Weldemicael

   We have developed a guidance tool that presented to our Bridge Enterprise Group several months ago, that manages a special funding source specifically dedicated to address our aging structures throughout Colorado. This group interfaces with each of the Regions in Colorado, and most regions had representation at the presentation. Because awareness was raised on the topic of bundling and the "Bundling Tool" our State Bridge Asset Manager requested a copy of the matrix and was able to utilize it in the planning and prioritization of projects for the next fiscal year portfolio of maintenance and construction projects.

   My observation as I had a brief discussion with the manager on their experience with the tool are as follows: The tool was easy to find, the use was intuitive, and the manager was overall pleased with the results, small victory but progress none the less.

   **Lessons Learned**: It was surprising that a small informal presentation of the tool had such an impact that it warranted its unsolicited use. A typical rollout of similar tools has taken much stronger internal marketing, followed executive management compelling the use of the tool. I think this tool makes sense and the simplicity of guiding the user through several simple conversations and soliciting consideration to obstacle and opportunity regarding the areas where bundling may provide some benefit, is intuitive. Both features contribute to a natural curiosity surrounding the tool and the intuitive nature of the tool makes it easily implemented. The next step in implementation is to raise awareness with the regional planners and present the tool in a similar fashion as it was presented to the Bridge Enterprise Group. I will begin to reach out to the regions and seek opportunities to meet individually with all who may be interested.

4. **Reducing Rural Roadway Departures (RwD)**
   https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/roadway_departures.cfm

   **CDOT Champion:** David Swenka

   CDOT's safety improvement programs, both the federally funded HSIP and the state funded FASTER Safety Mitigation, have completed policy and procedure updates in 2020, which will allow these programs to be more inclusive of systemic applications instead of relying solely on site-specific applications. This will potentially allow for more funding to go to improvements

for rural facilities to help reduce roadway departure crashes.

A new 2020 call for local agency HSIP projects was announced in December 2020. The announcement mentions that a portion of funding will be set aside for systemic improvements along high-risk rural roads (HRRR) or safety improvements targeting crashes involving vulnerable roadway users.

CDOT partnered with FHWA on presenting a webinar workshop in December 2020 ("Introduction to Systemic Approach to Safety"). This was a four-hour course leading practitioners through the systemic safety analysis process and focuses on the benefits of the systemic approach to safety, as well as the application of the methodology to identify systemic safety improvement projects through interactive exercises and case studies. This webinar benefits local agencies looking to develop local road safety plans or advance systemic safety projects with assistance from the Highway Safety Improvement Program (HSIP).

The Colorado HSIP procedural manual is planned to be updated in 2021 with provision of details and guidelines on how systemic safety improvements are to be evaluated and funded.

**Lessons Learned:** Executive sponsorship and direction is necessary in order to provide the best chance of large-scale effort to address an issue like roadway departures. It is our hope that the recent CDOT safety initiatives that have been able to set aside funding for strategic safety proves to be successful.

5. **Safe Transportation for Every Pedestrian (STEP)**
https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/step2.cfm

**CDOT Champion:** Betsy Jacobsen

- CDOT's STEP EDC champion, Betsy Jacobsen retired.
- CDOT completed the Colorado Statewide Transportation Safety Plan that includes a focus areaon pedestrian safety.
- CDOT is also nearing adoption of the 2045 Statewide Transportation Plan that includes anadded focus on non-motorized transportation and pedestrian access and safety.
- CDOT is also in the process of developing a new Colorado Roadway Design Guide that will incorporate Context Sensitive Design, Multi-Modalism and Performance Based Practical Design. These three pillars of design will provide a more comprehensive and holistic approach to designguidance.
- CDOT is also looking into developing a virtual training session for non-motorized detours inconstruction zones. While this is covered somewhat in CDOT's Chapter 14 of the Roadway
- Design Guide, it could be more comprehensive.

**Lessons Learned:** Due to COVID-19, pedestrian facility design classes that were scheduled had to be cancelled, as did the original FHWA Pedestrian Safety class thatwas scheduled. While in-person delivery of information is frequently preferred, finding new ways to use technology and provide similar experiences is important andbecoming the new normal.

6. **Unmanned Aerial Systems (UAS)**
https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/uas.cfm

**CDOT Champion:** Kathi Lyon and Casey Hensley
*Note - Casey Hensley replaced Kathi Lyon as CDOT champion*

- CDOT's UAS Manual is in a draft form, with a few incomplete sections. Completion is anticipated to be in early 2021.
- Electronic records, consistent with CDOT processes are being developed and will be

implemented in the first quarter of 2021.

- Setbacks with the pandemic and decreased funding availability have led to a strong grassrootseffort for the pilots and their supervisors to come together to develop this program, rather than hiring a single point of contact. The group is very experienced and willing to put in the work needed to get the program together.
- CDOT won a T2 grant to develop a demonstration project for the development of UAS ledbridge inspections.
- CDOT won a grant to develop a pilot project for permanent water quality inspections andmonitoring.
- CDOT has cultivated a relationship with Ohio DOT for guidance to develop a UAS program.

**Lessons Learned:** CDOT can draw from a large variety of subject matter experts that are enthusiastic about utilizing a new technology that is safer and more efficient. Creating a program based on the people that will be using the technology (pilots and data analysts) will create a program that isdynamic and adaptable to the needs of the UAS applications.
UAS is very attainable for CDOT because we already have many systems that the data and training can converge with. Electronic record keeping has been a clear and concise process.Data management can be used with current data management systems.

7. **Use of Crowdsourcing to Advance Operations**
https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/crowdsourcing.cfm

**CDOT Champion:** Jamie Yount, Matt Russmann

CDOT worked with ESRI to develop a traffic operations dashboard that gives users a live feed of Waze and Here Live Traffic data. Vehicle AVL data was also incorporated into the dashboard to aid operators in dispatching resources to incidents and events. This dashboard was implemented 18months ago and operators now rely on it for their situational awareness, incident reporting, and resource dispatching. Benefits include increase notification times for traffic incidents and increased response times for CDOT resources. CDOT has Institutionalized this application of crowd sourced data into day- to-day operations. Increased response time allows CDOT to provide a greater level of service to the travelling public. The ESRI platform has also been used to develop a data dashboard for avalanche mitigation operations and a pre-storm operational readiness application for maintenance equipment, material, and labor resources.

**Lessons Learned:** The traffic operations dashboard is a great success, and it is great to see it being used on a daily basis in our operations centers. The development of the dashboard is a great first step with crowdsourced data, but we are only just scratching the surface of the possible uses for this data. Now that we have developed the data infrastructure in place, we are excited to use this information in other capabilities.
The biggest obstacle was getting our operators familiar with a new tool and getting their buy in on the value it brought to their daily workflow. Another challenge will be maintaining the data infrastructure to keep this tool operating reliably.

8. **Virtual Public Involvement (VPI)**
https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/virtual_public_involvement.cfm

**CDOT Champion:** Aaron Willis

In light of the COVID-19 pandemic, CDOT has been forced to increase the usage of virtual public engagement tools and techniques for the Colorado Statewide Transportation Plan required 30-day public review and comment period. In response to the pandemic, CDOT has doubled the required public review and comment period to 60- days, to allow for increased participation by all interested parties. Additionally, CDOT will use e-mail blasts and virtual meetings to notify the public and stakeholders that the draft plan is available for public review and comment.

9. **EDC-5 Weather-Responsive Management Strategies (WRMS)**
https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/weather_strategies.cfm

**CDOT Champion**: Jamie Yount, Matt Russmann

CDOT is investing in more mobile friction sensor deployments. CDOT currently has 51 Teconer mobilefriction sensors deployed on maintenance supervisor pickups. This Fall CDOT is deploying 3 additionalsensors on the Bustang regional bus network. Future efforts are underway to deploy mobile friction sensors on plow trucks to help meet level of service goals to the traveling public in the most cost-effective way possible.

**Every Day Counts Next Steps**

FHWA, CDOT and CO LTAP (now with Front Range Community College) are working together toward deployment of these EDC-5 Innovations. Some related info is updated here: https://www.codot.gov/business/process-improvement/every-day-counts-edc

Final reporting to FHWA for EDC-5 is complete and available here: https://www.fhwa.dot.gov/innovation/everydaycounts/reports/edc5_finalreport.pdf

**EDC-6 Innovations (2021-2022).** Planning for the 2020 EDC Regional Summits involving thenext round of Every Day Counts (EDC 6) took place in 2020 and continues, with CDOT and FHWA participation. Originally, and as a welcome change, the EDC 6 Regional Summits wereto coincide with regional STIC leadership meetings. Tentative dates and locations had beenannounced (November 16 (STIC meeting) and November 17-18 (EDC-6 Summit) in Phoenix Arizona). However, for safety reasons most in-person events transitioned to virtual eventsduring 2020 due to COVID-19 and these were no exception.

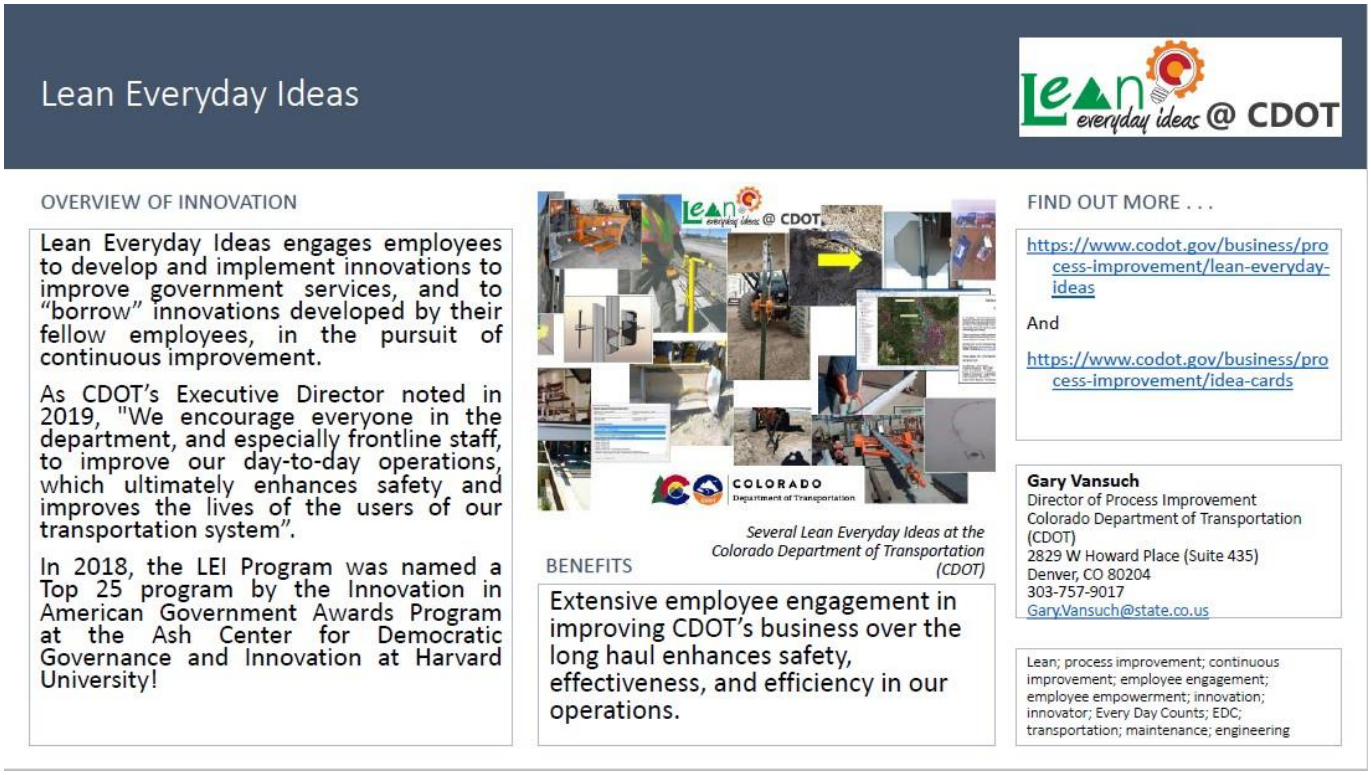
As a result, the Every Day Counts (EDC-6) National Summit was conducted virtually, December 8-10, 2020, with over 3000 attendees. More than 70 people from Colorado attended the virtual Summit including CDOT, FHWA, industry, academia, and others. CDOT had more than 25 participants attend, including the following potential champions for these EDC-6 initiatives:

- Crowdsourcing for Advancing Operations - Jamie Yount
- Next-Generation TIM: Integrating Technology, Data, and Training - Patrick Chavez
- Strategic Workforce Development - Kevin MacVittie and Melanie Vigil
- Targeted Overlay Pavement Solutions (TOPS) - Craig Wieden and Eric Prieve
- Virtual Public Involvement (VPI) - Tamara Rollison and Presley Fowler
- e-Ticketing - Paul Turtle
- UHPC for Bridge Preservation and Repair - Greg Marcuson

Additionally, CDOT, LTAP, and our local agency partners, provided the following ten posters highlighting innovation successes in CO for the Virtual Innovative Showcase, and CDOT's Gary Vansuch was invited to give a presentation on Lean Everyday Ideas.

- CDOT: Lean Everyday Ideas
- CDOT: Colorado DOT Saves Millions with 2D Hydraulic Quick Checks (2dQC) Initiative
- CDOT: Mobile RWIS & Road Friction Data Using Regional Bus Network & Snowplow Fleet
- Arapahoe County: JAWS-OF-LIFE Inexpensive Culvert Repair
- Gunnison County: Under Guardrail Reclaimer
- Arapahoe County: Glass Grid Dispenser
- El Paso County: Adaptable Bridge Safety Platform
- Town of Snowmass Village: Culvert Improvements with Low-Cost Drop Inlets
- City of Cañon City: Pipe Puller Device
- City of Westminster: Autonomous Vehicle Food Delivery Innovation

- Example poster:




These planning efforts helped CDOT identify champions and agree to participate in six of the seven EDC-6 Innovations during 2021-2022. Next steps for these involve participation in EDC-6 via Kickoff meetings, webinars, deployment activities, peer exchange, and the EDC Baseline Report, Status Reports, and Final Report. Additionally, the Colorado STIC (State Transportation and Innovation Council) will prioritize EDC in its annual evaluation of applications for STIC funding, providing additional potential resources for EDC champions.

**EDC, Round 6 (EDC-6)** -- CDOT opted in to a small number of Innovations for the currentround, EDC-6: https://www.fhwa.dot.gov/innovation/everydaycounts/edc_6/

That participation includes:

1. The Next Generation TIM (Traffic Incident Management) to better integrate technology,data, and training: CDOT's Patrick Chavez are the leads for this. CDOT:
    1. is working with local TIM Programs to identify and establish goals for program improvement, and stablished statewide goal to reduce CDOT/CSP annual average struck by incidents from 37 to 30;
    2. Supported integration of UAS by CSP VCU to help with mapping during investigations;and
    3. Applied and awarded STIC grant to develop tabletop exercise/AAR training modules. Working with CSP to establish a contracting scope of work in order to get proposals for this effort.

2. Virtual Public Involvement (VPI): CDOT's Presley Fowler is the lead for this. Since February 2021, CDOT has held several virtual public involvement events and we have more coming up soon. We have used a mix of online meetings (held on a specific dateand time) and online events which are kept open for 24/7 participation for a designated period of time. Promoting these events locally and through social media has led to great participation: much larger than CDOT normally experienced during in-person public events.

3. Targeted Overlay Pavement Solutions (TOPS): CDOT's Craig Wieden is the lead forthis. The action plan for TOPS for CDOT is currently under development.

4. E-Ticketing and Digital As-Builts: CDOT's Paul Turtle is the lead for this, and the planof action is under development.

5. UHPC for Bridge Preservation and Repair: CDOT's Greg Marcuson is the lead for this. Several CDOT Staff members have attended training/webinars about UHPC for BridgePreservation, and there is an increase in awareness among the CDOT structures staffin utilizing UHPC as a possible solution to issues for CDOT infrastructure.

You can find further information on the FHWA EDC website or contact David Garcia, FHWA CO DIV EDC Coordinator.

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# APPENDIX A. ENVIRONMENT SECTION - OTHER NOTABLE REGULATIONS AND ACCOMPLISHMENTS

**Priority projects:**

- T-REX construction - driven by Governor Owens/Tom Norton
- SH 85 and 120th extension signed in May 2003 - driven by Tom Norton
- US 36 - Quick Final EIS/ROD driven by Tiger Grant opportunity and Governor Ritter/Russell George
- I-70 Mountain Corridor Programmatic EIS rewrite driven by Governor Ritter/Russell George (finished up by Governor Hickenlooper/Don Hunt)
- Twin Tunnel East-Bound EA - driven by Governor Hickenlooper/ Don Hunt
- I-70 East EIS/ROD driven by Governor Hickenlooper/Shailen Bhatt
- I-25 South EA (aka The Gap) driven by Governor Hickenlooper

**Dropped projects:**

- NW Corridor EIS (became Jefferson Parkway, a private enterprise)
- Gaming Area EIS

**Notable Initiatives and Accomplishments:**

- First EA/EIS in this analysis started in 1999
- CDOT Environmental Stewardship Guide – 1st version in 2003, revised in 2005, and in 2017
- Desired State Task Force initiated in 2005 (initiated the idea for the NEPA Manual)
- Step-Up (precursor to Planning and Environmental Linkages [PEL]) – 2004-2007
- First PEL document drafted in 2007
- CDOT NEPA Manual – 1st Version in June 2007
- FHWA Non-Programmatic Environmental Review Summary developed in 2008
- CDOT NEPA Manual – 2nd version (total rewrite) in August 2008
- CDOT/FHWA/USACE NEPA/404 Merger Process and Agreement
- CDOT NEPA Manual – 3rd version in March 2013 with many updates and additions
- CDOT NEPA Manual – Version 4 released in October 2014 with many updates and additions
- EA Template was created, tested, and revised and was rolled out for general use after the signature on the SH9 Iron Springs EA in May 2014.
- PEL Handbook and Training Update 2015
- Cat Ex Programmatic Agreement Update - updating the user agreement between FHWA and CDOT for administration of Cat Ex Program.
- Federal Lands MOU – improved communication and NEPA processes for projects taking place on federal land - 2016.
- CDOT NEPA Manual Version 5 2017
- CDOT Environmental Stewardship Guide (updated for the first time in 12 years) 2017
- CDOT NEPA@CDOT Training

**Politics and Transportation Priorities:**

1987-1999 – Governor Roy Romer was in office (Bill Jones was Executive Director for CDOT) – It was during his term that the idea for T-REX came about. A Major Investment Study (MIS) identifying the need for the later-named "TRansportation EXpansion" dubbed "T-REX" was signed in 1995 and a more refined MIS was signed in 1997. In 1998, the DRCOG 20-year plan was adopted that had T-REX at the top of the priority list.

1999-2007 – Governor Bill Owens was in office (Tom Norton was Executive Director for CDOT): In November 1999, Owens brought his transportation funding initiative to the ballot. Called TRANS, the $1.7 billion bonding initiative accelerated future federal transportation dollars on 28 projects across the state. The keystone project on his campaign platform was the "TRansportation EXpansion" dubbed T-REX in 1999. T-REX combined road funding from TRANS with $460 million of new light rail lines to

expand a 19-mile stretch of Interstate 25 through the south Denver Metro Area. Through an innovative (one-of the-first-of-its-kind) design-build concept that greatly reduced construction times, T-REX was finished in less than five years, 2001 - 2006, and came in under budget. Owens was re-elected in 2002 by the largest majority in Colorado history, after making transportation, education, and tax cuts the focus of his governorship.

The passage of Referendum C in 2005 was in large part due to a wide coalition of bi-partisan supporters, including those in the business and transportation sectors. Although Ref C does not provide direct funds for transportation, it does allow transportation revenue to flow through Senate Bill 1 and House Bill 1310. The year prior to this, Tom Norton supported many corridor EAs and EISs including completing the "beltway" around the greater Denver area.

An early version of Planning and Environmental Linkages called Strategic Transportation, Environmental and Planning Process for Urbanizing Places (STEP UP) ran from approximately 2004 through 2007 and allowed CDOT to witness first-hand how the PEL approach could streamline its transportation planning. CDOT and FHWA-CO incorporated lessons learned from STEP UP to create new PEL tools for the state and to strengthen their relationships with federal and state resources and regulatory agencies. The success of the pilot also became a motivating factor in formalizing the PEL approach for Colorado's statewide transportation planning.

2007-2011 – Governor Bill Ritter was in office (Russell George was Executive Director for CDOT): Governor Ritter's campaign platform was based on the following statement, "As Governor, I will bring a fresh, balanced approach to how we invest in our infrastructure, plan for future growth, and protect the environment. Simply stated, the process for funding our transportation system is antiquated and needs a 21st century overhaul." In 2007, he convened a Blue-Ribbon Transportation Finance and Implementation Panel to investigate how to better prioritize and implement our infrastructure needs. In 2009, the Transportation Environmental Resources Council, a collection of regulatory and governing agencies, signed a partnering agreement for collaborating on PEL efforts to help streamline the NEPA process on large corridors.

On March 2, 2009 - Gov. Bill Ritter signed into law the FASTER transportation bill that put an emphasis on safety and bridge projects. In March through May 2009, Governor Ritter also certified 5 different Transportation Recovery Funds rounds of funding (ARRA) including one targeting transit projects, bringing multi-modal projects to the front and center of the discussion. He also proposed helping other local ventures handle their aging infrastructure and used the passage of FasTracks in metro Denver and Go 1A in greater Colorado Springs as examples of broad coalitions that were successfully built to win voter support and address regional needs.

Governor Ritter pointed out the I-70 Mountain Corridor as an example of proper planning with the environment, citing the way I-70 gracefully snakes through Glenwood Canyon. He said that this project and its concerns for our natural settings should serve as a model as we look for 21st century solutions to congestion problems throughout the I-70 mountain corridor. We must design projects that improve mobility, honor the environment, and protect the livability of adjacent communities. For this reason, he proposed to preserve a transit envelope as part of a long-term I-70 transportation solution. This put a priority on the I-70 Mountain Corridor NEPA process so that work could begin on this corridor.

US 36 improvements became a priority for Governor Ritter, so Colorado submitted for Urban Partnership funding in 2007. They did not get this funding but applied for and later received $10 million in TIGER Grant funds in 2010. To help position this project for the TIGER Grant after losing the Urban Partnership funding, the Governor put a priority in completing the EIS for this corridor to help position US 36 for this other funding. Tolling is up and running on the corridor and construction continues on stretches near McCaslin Blvd.

2011 to 2015 – Governor John Hickenlooper was in office (Donald Hunt was Executive Director for CDOT): Governor Hickenlooper saw the I-70 West Mountain Corridor as a critical corridor that affects commerce, tourism, recreation, and overall economic development with year-round congestion problems and began actively looking for funding.

He supported FASTER legislation; there were 178 bridges that were 75 years old, stretches of highways that were 75-100 years old, and expanses of interstate that are approximately 50 years old. He looked to innovative Public Private Partnerships (P3) funding to help with some needed projects as well. On October 17, 2013, 44 partnership projects were selected as part of the Responsible Acceleration of Maintenance and Partnerships (RAMP) program, totaling $580 million, to maximize and expand the statewide transportation system.

The governor put a high priority on the I-70 East (Central) EIS project, which had been ongoing for a number of years due to public controversy. This remains a high-profile corridor for CDOT, in part because of the aging viaduct that needs to be replaced, and a lot of resources and attention were placed on its completion by the Governor.

In September 2013, a large flooding event wiped out many major roadways in northwest Colorado. Governor Hickenlooper worked with CDOT to get access to all the areas isolated by the roadway damage with a promise to open all the damaged and closed highways by Dec 1st of the same year. This goal was met before Thanksgiving, with the understanding that the emergency repairs were temporary and that the permanent repairs would occur over the next several years. The intensity of this effort pulled resources off other projects, although the normal course of business was still expected to occur at the same time, just with a lower priority that might have delayed some of the other planning efforts going on around the state.

2015 to 2018 - Governor John Hickenlooper in office second term (Shailen Bhatt/Mike Lewis served as CDOT's Executive Directors: Governor Hickenlooper and FHWA had projects of significant interest. FHWA had Projects of Corporate Interest (POCI). The following projects were FHWA designated POCI:

- I-25: Colorado Springs Denver South Connection (PEL, NEPA, and construction)
- I-25 North (for implementation/construction)
- I-70 East (Procurement/construction)
- C-470 (for procurement/construction)
- US 36 (for financing/construction)

Additional projects on the I-70 Mountain Corridor, including the westbound Peak Period Shoulder Lane and improvements to Floyd Hill were a focus.

CDOT's decision making under NEPA was legally challenged twice in 2017. It was the first time in ten years since this has occurred.

- I-70 East lawsuit: In December 2018, CDOT reached a settlement with project opponents on their legal challenge. CDOT agreed to pay for a community health study and the planting of tress throughout nearby neighborhoods.
- C470 lawsuit: There was a decision for the C470 Kipling to I-25 NEPA challenge. In that case, the courts ruled that CDOT will need to update its noise guidance and reconfirm the model validation used for the C470 project, but the FONSI was not vacated. The judge revisited the Court's decision in late 2018. The court decision was that CDOT should improve it explanation of how its noise methodology is applied and used. The court remanded the decision back to FHWA and CDOT without a specific deadline. As a result, CDOT is updating the Noise Guidance and Abatement Criteria.

2019 to present - Governor Jared Polis in office first term (Shoshana Lew serves as CDOT's Executive Director):
In 2019, Governor Polis signed two Executive Orders (EO) that relate to EPB's mission:

1. 'Supporting a Transition to Zero Emission Vehicles' that set the tone for an administrationthat advances the priority of improving air quality through reducing emissions.
2. Conserving Colorado's Big Game Winter Range and Migration Corridor

In 2021 two state bills that affected the NEPA program were passed:

- Greenhouse Gas Pollution Reduction Roadmap (in response to HB19-1261) This roadmap

required Colorado to reduce Greenhouse Gas emissions incrementally (26% by 2025, 50% by 2030, and 90% by 2050). Transportation was identified as the largest source of GreenhouseGas pollution.

- Sustainability of the Transportation System (SB21-260): This bill created a new source of state funding for transportation projects as well as outlining new Greenhouse Gas, Air Quality, and Environmental/Equity requirements for 'regionally significant projects.'

In 2021 The CDOT Transportation Commission drafted a revision to the Code of Colorado Regulations to further define Greenhouse Gas requirements in Part 3 of CRS 43-1-128. This revision outlined stricter requirements for CDOT to reduce Greenhouse Gas emissions statewide, with an emphasis on statewide mitigation and regionally significant projects.

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# APPENDIX D. MAJOR NEPA PROJECT – HISTORICAL DATA

Note: “NUM!” refers to times that have not been calculated.

| Region | Task Name | Document Type | Start Date | EA or Draft EIS Signature | FEIS Signature Date | Decision Document Date | Total Duration (months) | Project Start to EA or Draft EIS Signature (months) | Draft EIS Signature to Final EIS Signature (months) | ProjectStart to Final EIS Signature (months) | Decision Document Duration (months) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | I-225 North of Parker Road toNorth of 6th Ave | EA/ FONSI | 1/28/1999 | 10/17/2000 | NA | 5/3/2001 | 27.00 | 20.00 | #N/A | 27.00 | 6.00 |
| 2 | I-25 North Colorado Springs | EA/ FONSI | 2/1/1999 | 3/29/2004 | NA | 9/10/2004 | 67.00 | 61.00 | #N/A | 67.00 | 5.00 |
| 3 | SH 9 | EIS/ROD | 3/23/1999 | 5/31/2002 | 3/4/2004 | 5/24/2004 | 62.00 | 38.00 | 21.00 | 62.00 | 2.00 |
| 1 | I-70 Mtn Corridor | EIS/ROD | 1/25/2000 | 8/10/2010 | 2/24/ 2011 | 6/16/2011 | 136.00 | 126.00 | 6.00 | 136.00 | 3.00 |
| 4 | I-25, 136th Ave Interchange | EA/ FONSI | 2/17/2000 | 5/15/2002 | NA | 1/8/2003 | 34.00 | 26.00 | #N/A | 34.00 | 7.00 |
| 1 | Northwest Parkway, I-25 Interchange | EA/ FONSI | 4/3/2000 | 2/12/2001 | NA | 5/23/2001 | 13.00 | 10.00 | #N/A | 13.00 | 3.00 |
| 3 | I-70 Eagle County Airport Interchange | EA/ FONSI | 4/14/2000 | 8/30/2004 | NA | 6/23/2005 | 62.00 | 52.00 | #N/A | 62.00 | 9.00 |
| 2 | WoodmenRoad | EA/ FONSI | 6/14/2000 | 12/16/2005 | NA | 12/14/2007 | 90.00 | 66.00 | #N/A | 90.00 | 23.00 |

| Region | Task Name | Document Type | Start Date | EA or Draft EIS Signature | FEIS Signature Date | Decision Document Date | Total Duration (months) | Project Start to EA or Draft EIS Signature (months) | Draft EIS Signature to Final EIS Signature (months) | ProjectStart to Final EIS Signature (months) | Decision Document Duration (months) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | I-25, 144th Ave Interchange, Adams County | EA/ FONSI | 7/7/2000 | 1/12/2005 | NA | 4/15/2005 | 57.00 | 54.00 | #N/A | 57.00 | 3.00 |
| 1 | I-70, Hogback Parking Facility | EA/ FONSI | 7/19/2000 | 2/14/2001 | NA | 8/13/2001 | 12.00 | 6.00 | #N/A | 12.00 | 5.00 |
| 1 | Nottingham Ranch Road (Post Blvd), I-70 | EA/ FONSI | 8/2/2000 | 1/11/2002 | NA | 4/25/2003 | 32.00 | 17.00 | #N/A | 32.00 | 15.00 |
| 1 | I-70, SH58 Interchange | EA/ FONSI | 9/18/2000 | 7/3/2002 | NA | 9/1/2004 | 47.00 | 21.00 | #N/A | 47.00 | 25.00 |
| 1 | South Simms St - US 285 Interchange | EA/ FONSI | 1/29/2001 | 9/6/2001 | NA | 4/1/2002 | 14.00 | 7.00 | #N/A | 14.00 | 6.00 |
| 1 | SH 402, US 287 toI-25 Interchange | EA/ FONSI | 8/13/2001 | 7/23/2007 | NA | 1/14/2008 | 77.00 | 71.00 | #N/A | 77.00 | 5.00 |
| 2 | PowersBlvd | EA/ FONSI | 10/29/2001 | 5/4/2010 | NA | 1/4/2011 | 110.00 | 102.00 | #N/A | 110.00 | 8.00 |
| 1 | I-25, Crystal Valley/ Dawson Ridge Pkwy | EA/ FONSI | 4/2/2002 | 9/20/2004 | NA | 2/28/2005 | 34.00 | 29.00 | #N/A | 34.00 | 5.00 |

| Region | Task Name | Document Type | Start Date | EA or Draft EIS Signature | FEIS Signature Date | Decision Document Date | Total Duration (months) | Project Start to EA or Draft EIS Signature (months) | Draft EIS Signature to Final EIS Signature (months) | ProjectStart to Final EIS Signature (months) | Decision Document Duration (months) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | SH 287 RelieverRoute inLamar | EA/ FONSI | 4/25/2002 | 8/15/2013 | NA | 11/10/2014 | 150.00 | 135.00 | #N/A | 150.00 | 14.00 |
| 1 | SH 285, Foxton toBailey | EA/ FONSI | 7/12/2002 | 8/11/2004 | NA | 6/3/2005 | 34.00 | 24.00 | #N/A | 34.00 | 9.00 |
| 1 | Valley Highway | EIS/ROD | 7/23/2002 | 4/19/2005 | 12/7/ 2006 | 7/5/2007 | 59.00 | 32.00 | 19.00 | 59.00 | 6.00 |
| 1 | 120th Ave Extension,SH 85, andQuebec | EA/ FONSI | 8/19/2002 | 5/27/2003 | NA | 8/1/2003 | 11.00 | 9.00 | #N/A | 11.00 | 2.00 |
| 2 | US 34 Business Route, SH 257 to 71st Ave | EA/ FONSI | 10/11/200 2 | 9/13/2005 | NA | 5/2/2006 | 42.00 | 35.00 | #N/A | 42.00 | 7.00 |
| 5 | US 160 Durango to Bayfield | EIS/ROD | 12/24/200 2 | 9/13/2005 | 5/12/ 2006 | 11/7/2006 | 46.00 | 32.00 | 7.00 | 46.00 | 5.00 |
| 2 | I-25 Through Pueblo | EIS/ROD | 1/27/2003 | 10/21/2011 | 8/15/ 2013 | 4/17/2014 | 134.00 | 104.00 | 21.00 | 134.00 | 8.00 |
| 5 | US 550, Improvement from State Line to CR 220 | EA/ FONSI | 2/12/2003 | 7/27/2005 | NA | 12/21/2005 | 34.00 | 29.00 | #N/A | 34.00 | 4.00 |
| 1 | I-70 East | EIS/ROD | 8/19/2003 | 10/29/2008 | 12/1 4/20 15 | 1/19/2017 | 161.00 | 62.00 | 85.00 | 161.00 | 13.00 |
| 2 | US 24, I-25 West to Manitou | EA/ FONSI | 8/27/2003 | 5/16/2012 | NA | 10/1/2014 | 133.00 | 104.00 | #N/A | 133.00 | 28.00 |

| Region | Task Name | Document Type | Start Date | EA or Draft EIS Signature | FEIS Signature Date | Decision Document Date | Total Duration (months) | Project Start to EA or Draft EIS Signature (months) | Draft EIS Signature to Final EIS Signature (months) | ProjectStart to Final EIS Signature (months) | Decision Document Duration (months) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | US 36 | EIS/ROD | 10/21/2003 | 7/23/2007 | 10/30/2009 | 12/24/2009 | 74.00 | 45.00 | 27.00 | 74.00 | 1.00 |
| 1 | SH 121, Wadsworth Blvd/Grand Ave | EA/FONSI | 11/28/2003 | 5/9/2005 | NA | 8/31/2005 | 21.00 | 17.00 | #N/A | 21.00 | 3.00 |
| 4 | North I-25 | EIS/ROD | 12/22/2003 | 10/31/2008 | 8/19/2011 | 12/29/2011 | 96.00 | 58.00 | 33.00 | 96.00 | 4.00 |
| 4 | SH 7, CherryvaleRd to 75thSt | EA/ FONSI | 3/1/2004 | 5/30/2008 | NA | 9/15/2008 | 54.00 | 50.00 | #N/A | 54.00 | 3.00 |
| 1 | I-225, Colfax Avenue Interchange | EA/ FONSI | 3/9/2004 | 10/20/2005 | NA | 3/30/2007 | 36.00 | 19.00 | #N/A | 36.00 | 17.00 |
| 4 | US 34 MadisonAve to Larimer County | EA/ FONSI | 9/1/2004 | 4/4/2007 | NA | 5/4/2007 | 32.00 | 31.00 | #N/A | 32.00 | 1.00 |
| 1 | I-70, E-470 Interchange Complex | EA/ FONSI | 9/24/2004 | 11/7/2006 | NA | 7/10/2007 | 33.00 | 25.00 | #N/A | 33.00 | 8.00 |
| 2 | DAR, US Army Pueblo ChemicalDepot | EA/ FONSI | 10/26/2004 | 1/16/2007 | NA | 5/7/2007 | 30.00 | 26.00 | #N/A | 30.00 | 3.00 |
| 1 | I-70/32nd Ave Interchange (Cabela's) | EA/ FONSI | 2/1/2005 | 10/23/2006 | NA | 2/28/2007 | 24.00 | 20.00 | #N/A | 24.00 | 4.00 |

| Region | Task Name | Document Type | Start Date | EA or Draft EIS Signature | FEIS Signature Date | Decision Document Date | Total Duration (months) | Project Start to EA or Draft EIS Signature (months) | Draft EIS Signature to Final EIS Signature (months) | ProjectStart to Final EIS Signature (months) | Decision Document Duration (months) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | South Broadway | EA/ FONSI | 6/1/2005 | 3/26/2008 | NA | 10/8/2008 | 40.00 | 33.00 | #N/A | 40.00 | 6.00 |
| 1 | SH 88, Federal Blvd, Alameda Ave to 6thAve | EA/ FONSI | 8/29/2005 | 11/14/2007 | NA | 2/28/2008 | 29.00 | 26.00 | #N/A | 29.00 | 3.00 |
| 2 | I-25, SH 16, East Entranceto Fort Carson | EA/ FONSI | 2/2/2006 | 7/12/2007 | NA | 9/20/2007 | 19.00 | 17.00 | #N/A | 19.00 | 2.00 |
| 2 | US 50 East | Combined FEIS/ ROD | 2/3/2006 | 8/12/2016 | 12/15/2017 | 12/15/2017 | 142.00 | 126.00 | 16.00 | 142.00 | 0.00 |
| 3 | I-70 East Eagle Interchange | EA/ FONSI | 7/18/2006 | 9/3/2010 | NA | 5/24/2011 | 58.00 | 49.00 | #N/A | 58.00 | 8.00 |
| 1 | I-70, I-70B West | EA/ FONSI | 8/8/2006 | 3/19/2008 | NA | 8/8/2008 | 24.00 | 19.00 | #N/A | 24.00 | 4.00 |
| 1 | 56th Ave Quebec to Havana | EA/ FONSI | 4/12/2007 | 9/4/2008 | NA | 1/15/2009 | 21.00 | 16.00 | #N/A | 21.00 | 4.00 |
| 1 | 6th Ave/Wads worth | EA/ FONSI | 6/1/2007 | 6/29/2009 | NA | 3/12/2010 | 33.00 | 24.00 | #N/A | 33.00 | 8.00 |
| 1 | I-25, North Meadows Extension to US 85 and I-25 | EA/ FONSI | 7/2/2007 | 3/23/2010 | NA | 3/17/2011 | 44.00 | 32.00 | #N/A | 44.00 | 11.00 |

| Region | Task Name | Document Type | Start Date | EA or Draft EIS Signature | FEIS Signature Date | Decision Document Date | Total Duration (months) | Project Start to EA or Draft EIS Signature (months) | Draft EIS Signature to Final EIS Signature (months) | ProjectStart to Final EIS Signature (months) | Decision Document Duration (months) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | I-70, ParachuteWest Interchange | EA/ FONSI | 8/24/2007 | 1/5/2010 | NA | 8/10/2010 | 35.00 | 28.00 | #N/A | 35.00 | 7.00 |
| 5 | US 550/160 Supplemental EIS | EIS/ROD | 10/1/2007 | 10/3/2011 | 7/3/2012 | 5/15/2015 | 91.00 | 48.00 | 9.00 | 91.00 | 34.00 |
| 3 | South Bridge - Glenwood Springs | EA REEA VL/ FONSI | 12/14/2007 | 10/8/2013 | NA | 10/1/2020 | 153.00 | 69.00 | #N/A | 153.00 | 83.00 |
| 1 | Central Park Blvd | EA/ FONSI | 7/3/2008 | 6/4/2009 | NA | 8/3/2009 | 13.00 | 11.00 | #N/A | 13.00 | 1.00 |
| 1 | I-25 DillonDrive | EA/ FONSI | 12/18/2008 | 1/26/2011 | NA | 7/28/2011 | 31.00 | 25.00 | #N/A | 31.00 | 6.00 |
| 1 | I-25 ArapahoeRoad | EA/ FONSI | 3/3/2010 | 8/29/2012 | NA | 3/15/2013 | 36.00 | 29.00 | #N/A | 36.00 | 6.00 |
| 1 | Martin Luther King Blvd Extension | EA/ FONSI | 8/16/2010 | 6/21/2017 | NA | 10/30/2017 | 86.00 | 82.00 | #N/A | 86.00 | 4.00 |
| 3 | Grand AveBridge | EA/ FONSI | 5/2/2011 | 10/18/2014 | NA | 5/28/2015 | 48.00 | 41.00 | #N/A | 48.00 | 7.00 |
| 1 | Twin Tunnels | EA/ FONSI | 9/1/2011 | 6/28/2012 | NA | 10/17/2012 | 13.00 | 9.00 | #N/A | 13.00 | 3.00 |
| 4 | I-25 North Revised ROD 2 | Revised ROD | 1/2/2012 | | NA | 7/23/2015 | 42.00 | #NUM! | #N/A | 42.00 | 42.00 |
| 4 | I-25 North Revised ROD 1 | Revised ROD | 1/2/2012 | | NA | 10/20/2017 | 69.00 | #NUM! | #N/A | 69.00 | 69.00 |

| Region | Task Name | Document Type | Start Date | EA or Draft EIS Signature | FEIS Signature Date | Decision Document Date | Total Duration (months) | Project Start to EA or Draft EIS Signature (months) | Draft EIS Signature to Final EIS Signature (months) | ProjectStart to Final EIS Signature (months) | Decision Document Duration (months) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | SH 9 Iron Springs | Template EA/ FONSI | 8/1/2012 | 5/6/2014 | NA | 12/17/2014 | 28.00 | 21.00 | 7.00 | 28.00 | 7.00 |
| 1 | C-470 I-25 to Kipling Revised EA | Template EA/ FONSI | 4/2/2013 | 7/24/2015 | NA | 9/1/2015 | 28.00 | 27.00 | 1.00 | 28.00 | 1.00 |
| 1 | I-76 and Bridge Street | Template EA/ FONSI | 5/1/2013 | 1/14/2015 | NA | 8/13/2015 | 27.00 | 20.00 | 6.00 | 27.00 | 6.00 |
| 2 | US 50 West, Purcell Blvd. to Willis Blvd. | Template EA/ FONSI | 12/16/2013 | 6/4/2014 | NA | 9/11/2014 | 8.00 | 5.00 | 3.00 | 8.00 | 3.00 |
| 1 | Federal Blvd, 7th to Howard Place | Template EA/ FONSI | 2/11/2014 | 10/8/2014 | NA | 1/14/2015 | 11.00 | 7.00 | 3.00 | 11.00 | 3.00 |
| 1 | 6th Ave Parkway Extension | Template EA/ FONSI | 9/19/2014 | 6/16/2016 | NA | 12/6/2016 | 26.00 | 20.00 | 5.00 | 26.00 | 5.00 |
| 2 | US 50 West, Willis Blvd to McCulloch Blvd. | Template EA/ FONSI | 3/18/2015 | 6/30/2016 | NA | 8/30/2016 | 17.00 | 15.00 | 2.00 | 17.00 | 2.00 |
| 4 | I-25 NorthROD 3 | Revised ROD | 3/7/2016 | | NA | 6/15/2016 | 3.00 | #NUM! | #N/A | 3.00 | 3.00 |
| 1 | Wadsworth Boulevard:35th-44th Widening | Template EA/ FONSI | 5/5/2016 | 4/1/2019 | NA | 9/1/2019 | 39.00 | 34.00 | 5.00 | 39.00 | 5.00 |

| Region | Task Name | Document Type | Start Date | EA or Draft EIS Signature | FEIS Signature Date | Decision Document Date | Total Duration (months) | Project Start to EA or Draft EIS Signature (months) | Draft EIS Signature to Final EIS Signature (months) | ProjectStart to Final EIS Signature (months) | Decision Document Duration (months) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | I-25 NorthROD 5: Vine St. Bridge Replacement | Ongoing ROD | 6/1/2016 | | NA | 12/15/2017 | 18.00 | #NUM! | #N/A | 18.00 | 1415.00 |
| **1** | Kipling andI70 Interchange | Template EA/ FONSI | 7/1/2016 | 1/1/2019 | NA | 3/20/2019 | 32.00 | 30.00 | 2.00 | 32.00 | 2.00 |
| 4 | I-25 NorthROD 4: | ROD | 7/1/2016 | | NA | 4/27/2017 | 9.00 | #NUM! | #N/A | 9.00 | 9.00 |
| | SH 392 to SH 56 | | | | | | | | | | |
| **3** | I-70 VailPass AuxiliaryLanes | Ongoing Template EA | 7/17/2017 | 9/1/2020 | NA | | #NUM! | 37.00 | #NUM! | #NUM! | #NUM! |
| **1** | I-70 FloydHill | Ongoing Template EA | 8/1/2017 | 7/9/2021 | NA | | #NUM! | 47.00 | #NUM! | #NUM! | #NUM! |
| 4 | North I-25 Segment 5/6 | Ongoing ROD | 8/1/2017 | | NA | | #NUM! | #NUM! | #N/A | #NUM! | 0.00 |
| 1 | I-25, Monumentto Plum Creek (Gap Project) | Template EA/ FONSI | 12/9/2017 | 4/25/2018 | NA | 6/27/2018 | #NUM! | 4.00 | 2.00 | 6.00 | 2.00 |
| **1** | 88th Avenue: I-76 to SH 2 | Template EA | 10/1/2018 | 5/20/2021 | NA | 10/14/2021 | 36.00 | 31.00 | | | 4.00 |
| **1** | I-270: Widening from I-76 toI-70 | Ongoing Template EA | 3/1/2020 | | | | | | | | |