

# COLORADO DEPARTMENT OF TRANSPORTATION FEDERAL-AID HIGHWAY PROGRAM

## STEWARDSHIP AGREEMENT

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DEVELOPED IN PARTNERSHIP WITH THE FEDERAL HIGHWAY ADMINISTRATION'S  
COLORADO DIVISION AND THE COLORADO DEPARTMENT OF TRANSPORTATION

We support the concept of this Stewardship Agreement and hereby direct that the stewardship and oversight of the Federal-Aid Highway Program be carried out in the spirit of a true partnership, as described herein.

 3-24-14

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 3/31/14

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## **SECTION 1. PURPOSE, BACKGROUND AND INTRODUCTION, TERMINOLOGY, AND SCOPE**

### **1.1. PURPOSE**

The purpose of this Stewardship and Oversight Agreement is to formalize the roles and responsibilities of the Federal Highway Administration (FHWA), Colorado Division and the Colorado Department of Transportation (CDOT) for administering the Federal-Aid Highway Program (FAHP). This Stewardship and Oversight Agreement outlines a risk-based approach for the FHWA-Colorado Division and CDOT to effectively and efficiently manage the Federal public funds entrusted to them and to ensure the FAHP is delivered in accordance with applicable laws, regulations, policies, and consistent with good business practices.

This Agreement outlines the framework by which FHWA and CDOT will administer the FAHP to maintain Colorado's national highway network, optimize operations, improve safety, manage assets and provide for national security while protecting and preserving environmental resources. This Agreement addresses a collaborative approach to administer the FAHP through various Stewardship and Oversight activities including the delegation of specific roles and responsibilities to CDOT.

Through this Stewardship Agreement, FHWA and CDOT management will pursue – within state and federal laws, regulations and policies – alternative and innovative methods for providing quality services and transportation products. The FHWA and CDOT partnership also ensures that federal funds will be expended cost-effectively and its implementation provides justification for continued disbursement of federal funds.

### **1.2. BACKGROUND AND INTRODUCTION**

Federal funding is provided to assist states and federal agencies in providing transportation services through the various FAHPs. By law, the nature and the majority of these federal programs is in the form of federal assistance for state administered programs. Previous Federal Transportation Bills, including the Moving Ahead for Progress in the 21<sup>st</sup> Century Act (MAP-21) of 2012 have all increased the role of State Transportation Agencies (STA) in project approvals.

On July 6, 2012, President Obama signed into law P.L. 112-141, the Moving Ahead for Progress in the 21st Century Act (MAP-21). MAP-21 creates a streamlined, performance-based, and multimodal program to address the many challenges facing the U.S. transportation system. These challenges include improving safety, maintaining infrastructure condition, reducing traffic congestion, improving efficiency of the system and freight movement, protecting the environment, and reducing delays in project delivery.

MAP-21 builds on and refines many of the highway, transit, bike, and pedestrian programs and policies established in 1991. MAP-21 expands the National Highway System (NHS) to incorporate principal arterials not previously included. Investment targets the enhanced NHS, with more than half of highway funding going to the new program devoted to preserving and improving the most important highways -- the National Highway Performance Program.

MAP-21 restructures core highway formula programs. Activities carried out under some existing formula programs – the National Highway System Program, the Interstate Maintenance Program, the Highway

Bridge Program, and the Appalachian Development Highway System Program – are incorporated into the following new core formula program structure:

- National Highway Performance Program (NHPP)
- Surface Transportation Program (STP)
- Congestion Mitigation and Air Quality Improvement Program (CMAQ)
- Highway Safety Improvement Program (HSIP)
- Railway-Highway Crossings (set-aside from HSIP)
- Metropolitan Planning

The cornerstone of MAP-21's highway program transformation is the transition to a performance and outcome-based program. MAP-21 sets a new direction for our industry. Its transformational policies provide additional flexibility to states in return for increased accountability toward national priorities. The program of the future will need to have a stronger data-driven performance element, and a more formal application of risk management principles.

These changes did not alter the fact that FHWA is the agency responsible for ensuring compliance with federal requirements in the delivery of the FAHP. These changes will affect how FHWA implements this responsibility. The flexibility afforded in MAP-21 still allows states to assume the U.S. Department of Transportation Secretary's responsibilities for design, plans, specifications, estimates, contract awards, and inspection of many Federal-aid projects. One exception to this flexibility is under Section 1503 (a) (4) which essentially states that FHWA shall maintain project level oversight for areas that it determines to be a high risk category.

§ 106 of Title 23, United States Code (USC), requires FHWA and CDOT to enter into an agreement that documents the delegation of responsibilities. MAP-21 further defines the requirements of stewardship and oversight responsibilities including the need to have a stronger data-driven performance element, and a more formal application of risk management principles.

In 1994, FHWA and CDOT jointly established Colorado's first Stewardship Agreement, which defined how they work together to provide project and program oversight. The Stewardship Agreement between FHWA and CDOT is intended to be a document that is under continual review. Each organization has the opportunity to make a change to the document when there is mutual agreement that the change(s) is necessary. Under this Stewardship Agreement, FHWA and CDOT will share the responsibility for oversight of programs and projects using Federal-aid funds.

The Stewardship Agreement has been updated several times and is currently agreed to be updated each year. The FHWA Colorado Division and CDOT will jointly review this agreement for edits, additions, corrections or clarifications necessary to provide a clear, understandable, user friendly document. The annual review will include an evaluation of the program Performance Compliance Indicators. This review will be performed by the applicable program managers from both CDOT and FHWA to ensure the FAHP is delivered in accordance with applicable laws, regulations, policies, and consistent with good business practices.

### 1.3. TERMINOLOGY

In order to ensure that this Stewardship and Oversight Agreement is consistently interpreted, the following definitions are provided:

**Stewardship:** *The efficient and effective management of the public funds that have been entrusted to the Federal Highway Administration.*



**Oversight:** *The act of ensuring that the FAHP is delivered consistent with laws, regulations and policies.*

Stewardship reflects FHWA's responsibility for the development and implementation of the FAHP. It involves all FHWA activities in delivering the program, such as leadership, technology deployment, technical assistance, problem solving, program administration and oversight.

Oversight is the compliance or verification component of FHWA stewardship activities that in turn ensures high-quality transportation projects. Narrowly focused, oversight activities ensure that the implementation of these FAHPs is done in accordance with the applicable laws, regulations, and policies. More broadly applied oversight activities enable CDOT and FHWA to ensure the effective delivery and operation of the transportation system envisioned in their base statutes. FHWA project level oversight means that FHWA will participate in the project development and construction process at specific milestones to assure compliance with federal regulations, policies, procedures, standards and that those federal dollars are being spent appropriately.

CDOT project level oversight will include their taking over FHWA responsibilities for all reviews and approvals associated with the design and construction, including final inspection, of Federal-aid projects. FHWA and/or CDOT will provide oversight and approval for Federal-aid projects on the following:

- Scoping (planning);
- Environmental documentation;
- Design and Design Exceptions;
- PS&E (Plans, Specifications & Estimates);
- Obligation of funding;
- Award of project;
- Construction;
- Final Inspection/Acceptance; and
- Project Closeout.

#### 1.4. **SCOPE**

This Stewardship Agreement outlines the project approval and oversight activities for Federal-aid projects that CDOT has assumed from the flexibility Congress provided within ISTEA, TEA-21, SAFETEA-LU, and MAP-21. These Transportation Bills have transferred responsibility to the States for the design, plans, specifications, estimates, contract awards and inspection of many Federal-aid projects. The Stewardship Agreement also outlines the mechanisms that CDOT will use to establish roles, responsibilities, and processes to ensure that all project and program actions will be carried out according to the appropriate laws, regulations, and policies. These responsibilities also apply to projects administered by local agencies.

At the program level, FHWA will continue to provide Stewardship and Oversight of the FAHP through a rigorous risk management process and through general actions and concurrences in its day-to-day activities, including improvements to program procedures, training, technical assistance, and development and deployment of new technologies, as well as routine program/project approval. Each of these activities contributes to the intent that the FAHP operates with integrity and for the public's maximum benefit. This Stewardship and Oversight Agreement acknowledges that the FHWA Colorado Division, CDOT, and all Local Agencies are responsible for the effective and efficient use of Federal funds.

FHWA and CDOT administer the FAHP through continuous program and project evaluation, and utilize a number of management tools to monitor the health of the FAHP. Program level performance indicators/measures and other strategies such as the Risk Management Framework, CDOT/FHWA Quality Improvement Council risk identification and response strategy process (QIC), and FHWA's Financial Integrity Review and Evaluation (FIRE) Program, are all utilized to continuously monitor the health of Colorado's FAHP.

#### **1.4.1. Quality Improvement Council**

CDOT and FHWA-Colorado Division established the Quality Improvement Council (QIC) and Quality Assurance Program (QAP) to coordinate process reviews, annual risk assessment, and the management of our Stewardship and Oversight Agreement. This QAP results in a complement of initiatives to help achieve our strategic goals, better meet our customer's needs and expectations, result in systemic improvement, assist with the deployment of innovative technologies, provide more focused technical assistance, and ensure the FAHP is being delivered consistent with applicable laws, regulations, policies and strategic goals.

CDOT and FHWA will jointly develop an annual prioritized list of risk statements and corresponding response strategies as stated in the Quality Improvement Council Operating Guidelines for the Quality Assurance Program (QAP). Each year a minimum of three joint CDOT/FHWA process reviews will be conducted as part of the identified risk response strategies. CDOT and FHWA will each have a Champion assigned to each response strategy who will manage the process including completion of the report (if necessary), implementation of the strategy and status of each strategy to monitor progress. This will help to help provide assurance that CDOT and/or local agencies are following all appropriate activities to carry out their respective roles and responsibilities according to applicable laws, regulations, and policies.

In addition to the QAP Program, CDOT conducts other activities to ensure the quality of its projects and programs. These include an Audit Program, Performance Measures Program, Value Engineering Program, Independent program and process reviews, and CDOT Self-Assessment efforts. The following is a brief explanation of the purpose and scope of each of these components:

#### **1.4.2. Audit Program**

CDOT Internal Auditors are to conduct and supervise: internal audits of CDOT, external audits of persons entering into contracts with the department, federally required audits, financial audits, and performance audits to determine the efficiency and effectiveness of CDOT operations. The internal audits often focus on the adequacy and effectiveness of internal and management controls. Audits also evaluate compliance with federal and state regulations and compliance with contract terms. Each year, the Commission's Audit Review Committee approves an annual audit work plan. As a part of the process for developing the CDOT Internal Auditor's work plan, managers throughout CDOT are surveyed concerning internal audit risks and audit needs. Coordination with the Quality Improvement Council (QIC) is planned as a part of the development of each fiscal year's work plan. Every effort is made to coordinate activities and prevent duplication. The Audit Program also plans on working with the Performance Measures Team to assist in verification of performance measure reporting, and to help evaluate the impact of the performance measures.

### 1.4.3. Performance Measurement Program

A key to successful strategic planning is having performance measures that give accurate and timely information. The ultimate aim of implementing a measurement system is to improve the organizational performance of CDOT resulting in an improvement in system performance. CDOT intends to use performance measures to continually evaluate progress towards accomplishing its goals and objectives, by determining where improvements can be made in its process, and readjusting work activities accordingly.

In 2012, work began on revising Policy Directive 14 (PD 14) as part of the statewide transportation planning process. The Transportation Commission sets policy direction and allocates resources to achieve performance objectives in PD 14, and it provides the overall framework for the transportation planning process through which a multimodal, comprehensive Statewide Transportation Plan is developed. Included in PD 14 are goals, performance measures and objectives, and planning principles. The four (4) goals are aligned with MAP-21 National Goals. Performance measures and objectives are being developed for the following goals:

- **Safety:** Reduce traffic fatalities and serious injuries and work toward zero deaths for all users.
- **Infrastructure Condition:** Preserve the transportation infrastructure condition to ensure safety and mobility at a least life cycle cost.
- **System Performance:** Improve system reliability and reduce congestion primarily through operational improvements and secondarily through the addition of capacity. Support opportunities for mode choice.
- **Maintenance:** Annually maintain CDOT's roadways and facilities to minimize the need for replacement or rehabilitation.

Transportation Commission approval of PD 14 is anticipated in early 2014 with the completion of the Statewide Plan.

Each goal has specific performance objectives and associated measures that provide the foundation for discussion on how to best invest available funds. Performance measures provide tools to relate the expenditures and work results to the policies, priorities, and goals of the Department as determined by the Transportation Commission. Performance measures are utilized on an annual basis as well as on a long range plan basis to relate expenditures and work results to the desired performance objectives (i.e., the desired end-result) for the State Highway system.

The next level of measures is comprised of Region, Division and Office Work Program Plans that encompass activities of each respective unit. All levels will have in place performance measure tools that link to and support the mission of the department. The desired outcome for the program is "improvement," whether this is in customer perception, productivity, timeliness, or quality, as well as to make better informed decisions. The Transportation Performance Branch within the Division of Transportation Development coordinates the Program, but the program is ultimately the responsibility of everyone in CDOT. The Quality Improvement Council under the Stewardship Agreement is responsible for ensuring quality assurance in work processes.

#### **1.4.4. Value Engineering Program**

Value engineering (VE) is required on all Federal-aid highway projects on the National Highway System (NHS) with an estimated cost of \$40 million or more. The purpose of this regulation (23 CFR 627.1) is to “establish a program to improve project quality, reduce project costs, foster innovation, eliminate unnecessary and costly design elements, and ensure efficient investments by requiring the application of VE”. The Design Program Manager in the Project Development Branch will be responsible for implementing, monitoring and reporting on the VE program. CDOT will complete an annual FHWA survey providing a summary of CDOT’s VE efforts for the past year. Typically this survey is done in January.

#### **1.4.5. Independent Reviews**

FHWA may conduct independent reviews that could include program reviews/product evaluations and continuous process improvement initiatives. These reviews will be done in consultation with CDOT. The review topics will be different from the QIC risk response strategies, audit, and performance measurement reviews issues chosen on an annual basis as previously discussed. In addition to FHWA oversight activities, stewardship activities will include technical assistance, technology deployment, performance measurement, and sharing best practices.

Notwithstanding any provision of this Stewardship Agreement, FHWA retains overall responsibility for all aspects of Federal-aid programs and this Stewardship Agreement does not preclude FHWA’s access to and review of any Federal-aid project at any time and does not replace the provisions of Title 23.

### **1.5. REPORTING AND RECORD-KEEPING**

#### **1.5.1. Reporting Responsibilities**

Reporting on the performance/compliance indicators will be undertaken based on the cycle defined in Section 3 of this report. An annual report prepared by the Quality Improvement Council will be completed by March of each year. Reporting will be done based on the cycle in the Stewardship and Oversight agreement. Reporting being done more frequently than annual will include data only with no formal report being prepared. The CDOT Transportation Performance Branch, Division of Transportation Development, will ensure delivery of data for performance measures and compliance indicators listed as being reported more frequently than annual. Data only reporting will be submitted electronically to the FHWA Colorado Division Management and Program Analyst.

#### **1.5.2. Document Retention Responsibilities**

CDOT is responsible for the retention of documents as they relate to the FAHP. This includes all records and documents generated for Title 23 eligible expenditures.

*End Section - 1*

## **SECTION 2. STEWARDSHIP AGREEMENT - DELEGATED RESPONSIBILITIES, CONFLICT RESOLUTION, & MISCELLANEOUS STIPULATIONS**

Under Title 23, FHWA is ultimately accountable for all programs under the FAHP; however, the State may assume responsibility for project-level activities associated with 23 USC 106 on certain projects.

The provisions of this Stewardship Agreement do not modify FHWA's non-Title 23 program oversight and project approval responsibilities for activities such as required under the *Clean Air Act*; *the National Environmental Policy Act of 1969 (NEPA)* and other related environmental laws and statutes; the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*; and the *Civil Rights Act of 1964* and related statutes, unless expressly permitted by MAP-21.

The collaborative process described below is intended to lead to a decision on FHWA Oversight for projects regardless of what phase they are in and is intended to capture the designation early in project development. Oversight projects are now called Projects of Division Interest (PoDI). Project specific oversight agreements will be required on each PoDI project and will document FHWA's involvement and approval actions for each phase. A project may only have FHWA involvement in a single phase, based on risk. This ongoing process will be completed as described below:

1. Current Status of Program: The FHWA Construction Program Manager in conjunction with CDOT Area Engineers will jointly develop an Annual Construction Program Report at the beginning of the calendar year assessing the health of the Construction Program. This annual report will document the status/issues/progress of the program based on information gained during the oversight of FHWA Oversight projects and of statistical sampling reviews conducted on Delegated-Oversight projects. The purpose of the report will be to identify best practices as well as ongoing and new risks. The report will be completed by May 15<sup>th</sup> of each year for presentation to the CDOT RTD's meeting in July.
2. Selection of New PoDI Projects: PoDI Projects are projects that have Federal-aid funds regardless of the roadway classification. In order to capture and analyze potential projects, FHWA Operations Engineers will attend their respective Region Plan Status meetings. FHWA Operations Engineers will complete a PoDI evaluation form for projects that fit at least one of the risk criteria listed below and that information will be reviewed by the FHWA Design and Construction Team Leaders who will make an initial oversight level determination. They will then present their recommendation to the appropriate CDOT Program Engineer who will respond with their concurrence or non-concurrence. If CDOT does not agree with a designation, a meeting will be held to resolve the issue. FHWA Operations Engineers will then complete a project specific Stewardship Plan for each project designated as a PoDI project. Nationally, FHWA has also designated projects as having a corporate interest. These projects are called "Projects of Corporate Interest", or PoCI projects.

The following factors will be used to consider oversight level: Workload distribution will be considered in the selection process.

- A Major Project
- A Design/Build Project
- Projects using complex funding (TIGER, TIFIA, P3, tolling)
- Special Experimental Projects – Alternative Contracting (SEP 14)
- Special Experimental Projects – Public Private Partnership (SEP 15)
- Unusual Bridge and Structure Projects

- Projects using innovative contracting/construction methods (SPMT, EDC)
- Politically sensitive or high profile projects
- Projects with a construction estimate of \$40M and over
- Projects on New Alignment
- PoCI projects
- EA's and EIS's
- Projects with complexities in design
- Projects with anticipated complexities in construction
- Complex Local Planning Agency (LPA) projects

In addition to PoDI projects and as part of FHWA's Compliance Assessment Program (CAP), the Colorado Division will fulfill its requirement to provide oversight to the Federal-aid program by performing construction inspections on statistically sampled non-PoDI projects. These reviews will be used to assess risks, identify best practices, and monitor new or ongoing concerns on non-PoDI projects. These reviews will be completed based on a sampling plan provided by the FHWA HQ on an annual basis and will focus on a set of core risk areas, and risk-areas identified by the Division in the previous Annual Construction Program Report. The results from these reviews will be used to develop the Annual Construction Program Report and determine best practices and risk areas/criteria for the next cycle of PoDI projects and the QIC risk assessment process.

## 2.1. **DELEGATED PROGRAM AND PROJECT RESPONSIBILITIES**

### 2.1.1. CDOT Responsibilities

CDOT assumes the Title 23 responsibilities of FHWA for all projects not identified as FHWA PoDI projects using the process described in Section 2. (See Table 2) Projects must comply with all Federal-aid requirements contained in Title 23. When a local government becomes the implementing agency of a construction project in which CDOT participates in the funding by allocation of FAHP funds, CDOT will review and assure local action for compliance with all requirements of Federal and State laws in accordance with Title 23. CDOT is not relieved of its responsibilities even though the project may be under the supervision of a public agency or organization. In accordance with 23 CFR 1.11, CDOT will ensure that the agency is well qualified and suitably equipped to perform the work.

CDOT may elect to invite FHWA Colorado Division to be involved in any CDOT Delegated Oversight project.

### 2.1.2. FHWA - Colorado Division Responsibilities

Under Title 23 and non-Title 23 (as noted under bullet 5), FHWA is ultimately accountable for the stewardship and oversight of all programs and projects under the FAHP.

1. FHWA PoDI Involvement: FHWA will develop a project specific oversight plan that describes their involvement. This plan will be shared with CDOT.
2. CDOT Delegated Oversight or Non-PoDI project Involvement: FHWA project level oversight responsibilities will be limited to ensuring compliance with non-Title 23 requirements and certain Title 23 requirements. FHWA will monitor project compliance through program reviews, process improvement studies, CAP reviews, etc. Also see bullet 5 below.

3. Other Project Involvement: FHWA Colorado Division in consultation with CDOT may elect to become actively involved with any Federal-aid transportation project, including those for which CDOT has assumed FHWA's responsibilities, when unique circumstances arise or when program or process reviews are being conducted. For all projects involving structures over or under the interstate, CDOT shall invite the appropriate FHWA Operations Engineer to the Project Scoping meeting to determine the level of FHWA involvement, regardless of funding.
4. Technical Assistance: The FHWA Colorado Division is prepared to provide technical assistance to CDOT or local agencies on any aspect of an eligible Title 23 project including intermodal transportation projects. Technical assistance activities will be decided on a case-by-case basis in consultation with CDOT, other partners and the FHWA Colorado Division. The FHWA Colorado Division will continue to focus their time and effort on improving processes and procedures, in cooperation with CDOT.
5. Non-Title 23 Responsibility: FHWA will continue to assume responsibility for Federal actions required under laws outside of Title 23, as noted in Section 3 in the respective sections, such as:
  - Activities for compliance with Section 102 (2) (c) of the National Environmental Policy Act (NEPA) of 1969 (42 USC 4321 et.seq.) and 23 CFR 771
  - Activities for compliance with Section 4 (f) of the Department of Transportation Act of 1966, P.L. 89-665, 49 USC 303
  - Civil Rights Act of 1964, 42 USC 2000 (d) et. seq. and 23 CFR 200 (Title VI), and 23 CFR 230 (EEO)
  - Uniform Relocation Assistance and Real Properties Acquisition Policies Act of 1970, 42 USC 4601, et. seq. 23 CFR Parts 710-740 and 49 CFR Part 24
6. Independent FHWA review program: Each year the FHWA Colorado Division may conduct independent process reviews that could include: program reviews, product evaluations, reviews required by law (e.g., NBIS, Planning, & HPMS) and continuous process improvement initiatives. These reviews may be done in consultation with CDOT.

### **2.1.3. Major Projects**

A major project is a project with an estimated total cost in the year of expenditure of over \$500 million and one that involves any amount of Federal financial assistance. Project Management Plan (PMP) requirements are found in (23 U.S.C. § 106(h)(2)). Financial Plan (FP) requirements can be found in (23 U.S.C. § 106(h)(3)(D), MAP-21 § 1503(a)(4)(B)). Financial Plans are required to have FHWA approval for projects with an estimated cost of more than \$500 million. Financial Plans for projects \$100 million to \$500 million require a review and approval by the Division. An initial and annual FP is also required for projects with an estimated cost from \$100-500 million. In addition, a Cost Estimate Review is required for projects greater than \$500 million as per (23 U.S.C. § 106(h)(3)).

FHWA and CDOT will place special emphasis on major projects including more extensive review of project costs estimates, through Cost Estimate Reviews (CER), Project Management Plans (PMP), risk analysis and the development of Finance Plans. Detailed guidance on FHWA's expectations are found on the FHWA major project website including an FHWA memorandum from the FHWA Administrator dated January 19, 2007 - <http://www.fhwa.dot.gov/programadmin/mega/index.cfm>

1. Risk Management Tool: FHWA will utilize a document titled “Risk Management Tool for Managing the Planning/Environmental Phases of Prospective Major Projects,” located on the FHWA major project website;
2. Cost Estimate Reviews (CER): Prior to submitting an EA or FEIS to FHWA, CDOT shall coordinate with the Division Office to schedule an independent cost estimate review of the cost estimate for the preferred alternative. Guidance on cost estimating is found on the FHWA major project website:  
[http://www.fhwa.dot.gov/ipd/project\\_delivery/tools\\_programs/cost\\_estimating/process.htm](http://www.fhwa.dot.gov/ipd/project_delivery/tools_programs/cost_estimating/process.htm)
3. Project Management Plan (PMP): A draft PMP must be submitted to FHWA for review prior to approval of the NEPA decision document (within 60 days prior to submittal of the Decision document). FHWA will provide comments and CDOT shall submit a PMP for approval within 90 days of the date of the signed NEPA decision document. This document should clearly define the roles, responsibilities, processes, and activities necessary to manage the project, which will result in the major project being completed on time, within budget, and with the highest degree of quality and safety. A PMP must be approved prior to any federal action such as authorizing federal funds for ROW or construction. Also, during construction, the PMP must be revised and updated periodically as needed to reflect current status of the major project. Guidance on a PMP is found on the FHWA major project website.  
[http://www.fhwa.dot.gov/ipd/project\\_delivery/tools\\_programs/project\\_management\\_plans/index.htm](http://www.fhwa.dot.gov/ipd/project_delivery/tools_programs/project_management_plans/index.htm)
4. Finance Plans: An Initial Finance Plan shall be submitted to FHWA for review and approval. The FP shall be submitted to provide sufficient time such that review and approval can be obtained for construction. Depending upon the complexity of the project, the FP should be submitted at a minimum of 90 days prior to the planned advertisement date. On a designated date, until completion of construction, CDOT will submit an annual update and certification for FHWA Division Office approval. Guidance on a major project Finance Plan is found on the FHWA major project website. <http://www.fhwa.dot.gov/programadmin/mega/fplans.cfm>.

## 2.2. LOCAL PUBLIC AGENCY PROGRAM AND PROJECTS

Local Public Agency (LPA) administered Federal-aid projects are those which are, at a minimum, managed through design or construction or both, by an LPA other than a State Transportation Agency (STA). In many cases, the LPA may also manage environmental studies and documentation, appraisal and acquisition of right-of-way, the bid and award process, and the billing process.

Title 23, does not recognize local entities as direct recipients of Federal-aid funds. Accordingly, local agencies cannot take the place of CDOT in the context of the FAHP. CDOT is responsible for all requirements of the Federal-aid program whether these requirements stem from Title 23 or non-Title 23 statutes.

The language of Title 23 USC §106(g)(4) is clear in its assignment of responsibility for locally administered projects to the States. 23 §106(g)(4) states, the States shall be responsible for determining that sub-recipients of Federal funds have adequate project delivery systems for projects approved under this section; and sufficient accounting controls to properly manage such Federal funds. CDOT needs to commit sufficient staff and other resources to project and program administration to ensure that all applicable State and Federal requirements are met, and the work is accomplished efficiently. The same section also states, that FHWA shall periodically review the monitoring of sub-recipients by the States.



CDOT's Local Agency Manual assists Local Agency personnel involved in the design, construction and management of State and Federally funded project ([http://www.coloradodot.info/business/designsupport/bulletins\\_manuals/2006-local-agency-manual](http://www.coloradodot.info/business/designsupport/bulletins_manuals/2006-local-agency-manual)). The Local Agency Program Manager in the Project Development Branch is responsible for updating guidance and training related to the Local Agency Program.

CDOT will develop and maintain written/online procedures outlining the necessary processes, approvals, oversight and review to ensure the delegated projects receive adequate supervision and inspection, and are completed in conformance with approved plans, specifications and applicable federal and state requirements. These procedures will be reviewed and concurred in by the Division Office.

### 2.3. **HIGH PERFORMANCE TRANSPORTATION ENTERPRISE (HPTE)**

The High-Performance Transportation Enterprise (HPTE) was formed to aggressively pursue innovative means of more efficiently financing important surface transportation infrastructure projects that will improve the safety, capacity, and accessibility of the surface transportation system, can feasibly be commenced in a reasonable amount of time, will allow more efficient movement of people, goods, and information throughout the state, and will accelerate the economic recovery of the state.

Such innovative means of financing projects include, but are not limited to, public-private partnerships, operating concession agreements, user fee-based project financing, and availability payment and design-build contracting.

The HPTE shall operate as a government-owned business within the department and shall be a division of the department. As a Division of CDOT the requirements of this Stewardship Agreement shall apply to all HPTE projects and initiatives. The HPTE Director will coordinate on a regular basis with the FHWA Program Delivery Team Leader to define roles and responsibilities of HPTE projects.

### 2.4. **Office of Major Project Development**

The purpose of the Office of Major Project Development (OMPD) is to assist the Department and the High Performance Transportation Enterprise (HPTE) to effectively and efficiently develop major projects through the promotion of consistency in the advancement, oversight, and execution of major projects.

Functions the Office will perform in furtherance of this purpose include:

- Conduct early project development activities and determine the overall feasibility of potential major projects. This include project scoping, conceptual design, preliminary environmental evaluations, benefit cost analysis and coordinating with the HPTE in its initial financial analysis to determine the project delivery structure and the appropriate roles in that project's delivery for the Department and the HPTE respectively.
- If a project is deemed feasible, the Office will oversee and/or execute project development activities in conjunction with the CDOT regions and the HPTE up to and including the final procurement of the project. The Office also will develop management tools to assist the regions and HPTE in the project construction phase and any follow on activities such as long term operations and maintenance oversight, contract administration or periodic technical reviews.

- Additional functions of the Office include acting as the department’s authority and lead practitioner for best management and contracting practices for department wide consistency in the development of major projects and major project related development and procurement documents, providing technical assistance to other CDOT and HPTE staff, managing the project development processes, assessing the feasibility and development of financial plans for major projects in conjunction with the HPTE, and policy formulation and coordination of roles with the HPTE.

As a Division of CDOT, the requirements of this Stewardship Agreement shall apply to all OMPD projects and initiatives. The OMPD Director will coordinate on a regular basis with the FHWA Program Delivery Team Leaders to define roles and responsibilities of OMPD programs and projects.

## 2.5. CONFLICT RESOLUTION PROCESS

If disagreements emerge which cannot be resolved, the impasse shall be escalated as shown below. If other agencies are involved, personnel from equivalent organizational levels will be included in the conflict resolution process.

**Table 1 - Conflict Resolution Process**

CDOT	FHWA	Meeting Date Established Within
Project Coordinator	Operations Engineer	
Regional Transportation Director	Program Delivery Team Leader	14 days
Chief Engineer	Assistant Division Administrator	30 days
Executive Director	Division Administrator	30 days

When the parties at the lowest organizational level of the agencies have agreed to escalate, a meeting date will be established within 14 days. At that time, the agencies from both levels will meet to discuss the issues and come up with a resolution. If an agreement cannot be reached, then the issue will be escalated to the next level and a meeting date established within 30 days. At that time, the agencies from all three levels will meet to discuss the issues and come to a resolution. If an agreement cannot be reached, the issue will be escalated to the highest level and a meeting date established within 30 days. At that time, all agencies will come to resolution.

Mediation and facilitation may be used at any level to help expedite resolution. Documentation of all disagreements and resolutions shall be furnished to all involved agencies and included in the project file.

## 2.6. OVERSIGHT AUTHORITY AND MISCELLANEOUS STIPULATIONS

### 2.6.1. FHWA Oversight Authority

FHWA’s authority will be specified in the project specific oversight plan and could include the following:

- Plan, Specifications & Estimates Approval;
- Approval of design exceptions on non-Interstate facilities
- Contract Concurrence in Award;
- Contract Change Order Approval;
- Approval of Contract Claims Settlement;
- Final Inspection; and
- Project Acceptance.

Approval of Design Exceptions on the Interstate will always rest with FHWA.

### **2.6.2. Exceptions**

The following actions require the approval of FHWA regardless of project funding:

- Addition of access points on the Interstate System;
- Changes in the access control of the Interstate;
- Use of Interstate airspace for non-highway-related purposes;
- Disposal of Interstate Right of Way;
- Design exceptions affecting Interstate highways (13 controlling criteria); and
- Changes in Interstate Land Use or Operations.

The following actions require the approval of FHWA for Federal-Aid Projects, regardless of oversight:

- Obligation of funds;
- Waivers to Buy America requirements (FHWA Washington Headquarters (HQ) approval required as noted in Mr. Horne's July 3, 2003 memorandum);
- SEP-14/SEP-15 methods (FHWA HQ approval required for experimental contracting/project delivery methods);
- Civil Rights program approvals;
- Environmental approvals except those specifically delegated under the "Programmatic Agreement between CDOT and FHWA for the Review and Approval of Certain NEPA Categorically Excluded Transportation Projects",
- Hardship acquisition and protective buying;
- Modifications to project agreements;
- Final vouchers; and
- Project Limit Extensions.

### **2.6.3. Advance Construction**

Use of Advance Construction procedures to ensure future federal reimbursement of funds for a project is considered use of Federal-aid funds.

### **2.6.4. Bonding**

If a project is financed with bond proceeds, and debt service is anticipated to be paid using federal funds, it shall be considered a Federal-aid project.

### **2.6.5. Special Experimental Project No. 14 - Innovative Contracting Award**

FHWA Headquarters' SEP-14 approval is necessary for any non-traditional construction contracting technique that deviates from accepted operational practices approved under current statutes. Any contract which utilizes a method of award other than the lowest responsive bid (or force account as defined in 23 CFR 635 Subpart B), with the exception of Design-build and Construction Manager/General Contractor should be evaluated under SEP-14. Design-build procurement processes which deviate from the requirements of 23 CFR 636 may require an SEP-14 work plan and approval. FHWA maintains an SEP-14 Active Project List at the following link:  
<http://www.fhwa.dot.gov/programadmin/contracts/sep14list.cfm>

#### **2.6.6. Special Experimental Project No. 15 - Innovative Contracting**

SEP-15 is an experimental process for FHWA to identify for trial evaluation new public-private partnership approaches to project delivery. It is anticipated that these new approaches will allow the efficient delivery of transportation projects without impairing FHWA's ability to carry out its stewardship responsibilities to protect both the environment and American taxpayers. SEP-15 addresses, but is not limited to, four major components of project delivery: contracting, compliance with environmental requirements, right-of-way acquisition, and project finance. Elements of the transportation planning process may be involved as well.

SEP-15 applications should be submitted by CDOT to the FHWA Colorado Division Office. Applicants may include localities and private transportation ventures as project sponsors but must include CDOT. SEP-15 applications should provide a brief description of the project and specific Federal-aid program areas of experimentation, explain the innovative techniques proposed and the expected value of those techniques, and identify proposed performance measures to evaluate the success of the SEP-15 project.

#### **2.6.7. Oversight Responsibility Matrix**

The matrix on the next page identifies when FHWA is required to be involved in project activities according to the funding source. Additional FHWA required actions are listed in Section 3.

**Table 2 - FHWA Project Activities Involvement Matrix**

Phase of Work <sup>(1)</sup>			FHWA Involvement in Project Activities							
Preliminary Engineering (Design)	ROW & Utilities	Construction	Scoping	Environmental Clearance	Access Control & ROW Disposal (2)	Plan Development (Design) (3)	Structural Review (4) (8)	ROW Plan Approval	PS&E Approval (5)	Construction Changes, Claims, etc.
<b>CDOT Delegated Oversight</b> All Projects Not Explicitly Determined to be FHWA Oversight										
<b>Source of Funding</b>										
Federal or State	Federal or State	Federal or State	No	Yes (2)	Yes	No (4) (7) (9)	No	No	No	No
State	State	State	No	No (2)(3)	Yes	No (4) (7) (9)	No	No	No	No
<b>FHWA Oversight (PoDI)</b> Projects Selected Utilizing Risk-Based Approach (See Section 2)										
<b>Source of Funding</b>										
Federal	Federal or State	State	Per PoDI agreement	Per PoDI agreement	Yes	Per PoDI agreement	Per PoDI agreement	No	No	No
Federal	Federal or State	Federal	Per PoDI agreement	Yes	Yes	Per PoDI agreement	Per PoDI agreement	Per PoDI agreement	Per PoDI agreement	Per PoDI agreement
State	Federal or State	Federal	Per PoDI agreement	Yes	Yes	Per PoDI agreement	Per PoDI agreement	Per PoDI agreement	Per PoDI agreement	Per PoDI agreement
State	Federal	State	Per PoDI agreement	Per PoDI agreement	Yes	No (4) (9)	No (9)	No	No	Per PoDI agreement

- (1) FHWA approval is required on all phases when federal funds are used regardless of oversight.
- (2) If no Federal-aid funds are in the project, FHWA does not require a NEPA analysis except as explained in note (2). CDOT may elect to produce a Federal environmental document for any project, to afford an easier opportunity to convert one or more phases to Federal funding at a later time.
- (3) Federal approval for changes in right-of-way and access control is required on the Interstate regardless of the type of funding. For the following actions, a NEPA document also needs to be completed:
  - Changes in Interstate Access Control;
  - Lease of Interstate Right-of-Way;
  - Disposal of Interstate Right-of-Way.
- (4) Design, Approval of Design, and PS&E development. Design exceptions are required regardless of funding on the Interstate, non-interstate will be on a case by case basis.
- (5) Review of major structural designs for bridges with surface area exceeding 125,000 square feet or those with unusual hydraulic, geotechnical or structural features (see FHWA Order 5520.1).
- (6) Includes approval to proceed to advertisement and Concurrence in Award of Contract.
- (7) FHWA participates when invited by CDOT, where federal project oversight is in use for Design or Construction.
- (8) For CMOs:
  - Project Termini Extensions, regardless of oversight (as defined in 23 CFR 635.102 and CDOT's Construction Manual, 120.7.7.3)

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- Major Design Changes (as defined in CDOT's Construction Manual, 120.7.7.1, "significant" to be determined via discussions between Operations Engineer and CDOT)
  - Material Change to the Scope of Work (i.e. additional capacity, additional access, major extra work, deletion of work etc.)
  - Changes affecting Environmental Commitments
  - Administrative Resolution of Claims (excluding Dispute Review Board Recommendations)
- (9) For all projects involving structures over or under the interstate, CDOT shall invite the appropriate FHWA Operations Engineer to the Project Scoping meeting to determine the level of FHWA involvement.

*End Section – 2*

## **SECTION 3. CDOT & FHWA Roles and Responsibilities by Functional Program Areas**

The following subsections of Section 3 describe the functional/program stewardship and oversight areas that are subject to this Stewardship Agreement. This section provides information on how CDOT and FHWA are organized to accomplish each of the functional/program areas. In addition, each subsection will address required reviews, specific working relationships, and efforts relating to management systems. In addition a “FHWA Required Actions List” has been included in the Performance/Compliance Indicators subheading of each subsection. This will help to delineate the actions that are required through the 23 Code of Federal Regulations (CFR) and other policy and guidance.

Under this Stewardship Agreement, CDOT Staff Branches are responsible for facilitating the preparation of statewide policy and procedural directives, providing technical assistance, conducting continuous technical training, and providing quality assurance (QA) in all program areas. In some instances the Staff Branches may be responsible for project production. CDOT Region offices are responsible for preparing project scoping and scheduling documents, environment and right-of-way clearance documents, local entity agreements, and overall management of the individual projects.

The FHWA Colorado Division is responsible for the stewardship and oversight of the Federal-aid Highway Program in Colorado. FHWA Operations Engineers are responsible for the oversight activities and the Program Managers are responsible for the stewardship activities. In many instances, the Operations Engineers may be responsible for both stewardship and oversight. The Program Managers are responsible for relating policy, providing technical assistance, working with other federal agencies and guiding their programs on a statewide basis. Both the Operations Engineers and Program Managers are responsible for ensuring quality assurance (QA) of the entire FAHP in Colorado. FHWA Team Leaders are responsible for ensuring the Operations Engineers and Program Managers receive the appropriate leadership so that they may conduct an efficient and effective QA program.

### **3.1. ENVIRONMENT**

#### **3.1.1. Introduction**

The Environmental Program is based on policy guidance from both CDOT and FHWA.

The national commitment to the environment was formalized through the passage of the National Environmental Policy Act (NEPA) of 1969. NEPA establishes a national environmental policy and provides a framework for environmental planning and decision-making. NEPA directs FHWA and CDOT, when planning projects or issuing permits, to conduct environmental reviews to consider the potential impacts on the environment by their proposed actions. The NEPA process consists of a set of fundamental objectives that include interagency coordination and cooperation and public participation in planning and project development decision-making.

Environmental reviews involve an interdisciplinary and interagency process. FHWA and CDOT work cooperatively with other federal and state agencies during the environmental review process. This coordinated review process includes input from the public, as well as from other agencies, to guarantee that all environmental protections, as well as all other issues are addressed.

Environmental streamlining drives FHWA to improve project delivery without compromising environmental protection. Environmental stewardship helps demonstrate that FHWA is mindful of the natural and human environment while addressing mobility and safety needs of the public. FHWA promotes actions that show it is a responsible steward of the environment. FHWA takes advantage of opportunities to enhance environmental protection and encourage partnerships that promote ecosystem conservation or encourage broader mitigation strategies that seek corridor or watershed based approaches. Environmental streamlining solutions must go hand in hand with principles of stewardship.

CDOT's "Policy Directive 13, Operating Principles. Environment" states the following: CDOT will support and enhance efforts to protect the environment and quality of life for all its citizens in the pursuit of providing the best transportation systems and services possible. CDOT will:

- Promote a transportation system that is environmentally responsible and encourages preservation of nature and enhancement of the created environment for current and future generations;
- Incorporate social, economic and environmental concerns into the planning, design, construction, maintenance, and operations of the state's existing and future transportation system;
- Objectively consider all reasonable alternatives to avoid or minimize adverse impacts with the active participation of the general public, federal, state and local agencies;
- Ensure that measures are taken to avoid and minimize the environmental impacts of construction and maintenance of the transportation system, all activities are in compliance with all environmental statutes and regulations, and mitigation commitments are implemented and maintained;
- Plan, design, construct, maintain and operate the transportation system in a manner which helps preserve Colorado's historic and natural heritage and fits harmoniously into the community, local culture and the natural environment.
- Promote a sense of environmental responsibility for all employees in the course of all CDOT activities and will go beyond environmental compliance and strive for environmental excellence.

The Transportation Commission supports proactive techniques to mitigate impacts of the transportation system on the environment by developing creative strategies that:

- Comprehensively address anticipated environmental impacts of the state transportation system;
- Consider project enhancements in affected communities in a cost effective manner;
- Are consistent with the mission of the Department;
- Expedite project development.

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

- Environmental issues are identified early;
- Appropriate impact analyses are performed in a timely manner;
- Adequate documentation is submitted and reviewed as scheduled;



- 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.
- Environmental commitments are completed.

Timely compliance with the environmental requirements is critical for advancing projects. The Regions, with the assistance from the Project Development Branch, and 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.

### **3.1.2. Method of Operation**

For the environmental function, FHWA maintains ultimate responsibility and approval authority for all activities requiring federal actions. Interagency coordination and stewardship are maintained through routine contacts in person, by telephone, by electronic mail, and in writing during the course of transacting normal business operations. Contact normally occurs between the FHWA Environmental Program Manager (Env PM) and CDOT's Environmental Programs Branch (EPB) Manager. On specific project activities, stewardship and oversight coordination occurs between CDOT's decentralized Region Planning and Environmental Managers (RPEMs) and FHWA Operations Engineers (OEs). The CDOT EPB Manager, FHWA Env PM, and CDOT Environmental Specialists assist in coordinating interagency approvals for various environmental resources impacted by projects.

Environmental considerations affect virtually all aspects of transportation. Coordination and interaction with other disciplines is necessary to administer the environmental program. Sometimes project specific decisions affect statewide policy. In such cases, the RPEMs should consult with the EPB Manager and FHWA Env PM. Similarly, if the CDOT EPB Manager or the FHWA Env PM observes potential policy implications of project level decisions, such concerns should be discussed with the CDOT RPEM and the FHWA OE. The FHWA Planning and Environment (P&E) Team Leader and Env PM will work with other federal agencies and the EPB Manager on program and project matters to ensure statewide consistency in intergovernmental working relationships.

In the environmental functional area, there are several diverse factors that influence the quality of the products and services delivered. First, the timely delivery of specific environmental activities is critical to advancing transportation projects toward successful completion. For CDOT staff specialists, project compliance activities should be completed on or ahead of the established schedule date. For Region personnel, all NEPA documents should be completed in time for review and approval by FHWA prior to the scheduled project advertisement date. For major NEPA documents (EAs and EISs), EPB review will be completed prior to forwarding documents on to FHWA for approval, unless otherwise agreed to in advance per CDOT's Environmental Document Review Procedures. Second, CDOT's public involvement procedures should conscientiously solicit the views of all affected publics and should be implemented in accordance with Executive Order 12898 on Environmental Justice. The general effectiveness of this program can be measured by the number, substance and general tone of both positive and negative comments received on the environmental documents. Third, FHWA and CDOT should constantly strive to improve the existing working relationships with the many resource protection agencies involved in the environmental functional area (the US Fish and Wildlife Service, the US Army Corps of Engineers, the US Environmental Protection Agency, the State Historic Preservation Office, the Colorado Parks and Wildlife, the Colorado Department of Public Health and Environment, etc.).

### **3.1.3. CDOT Organization**

CDOT's environmental function is divided between the Region environmental offices and the central office staff, consisting of the EPB. The CDOT environmental program consists of numerous interrelated responsibilities requiring close coordination between all parts of CDOT.

EPB generally has the lead in providing technical expertise to the Regions and other CDOT Branches/Divisions, assisting regions with project development by providing specialty clearances, reviewing of NEPA documents, resolution of special environmental issues, and development and implementation of memoranda of understanding and agreement with resource and regulatory agencies.

The Branch also develops environmental streamlining initiatives, environmental policy guidance, programmatic agreements, and environmental data for use in the planning and project development process, and assists Regions in early corridor environmental analyses.

Regions are responsible for all project development-, construction- and maintenance-related environmental activities, with assistance from central staff as necessary.

### **3.1.4. FHWA Organization**

Oversight of the environmental function in the Colorado Division Office is the responsibility of the P&E Team Leader, Env PM and the OEs assigned to each of CDOT's Region offices. FHWA's primary responsibility is to review, interpret and provide guidance and training on environmental policy, procedures and regulations by maintaining active liaison with the CDOT program and project personnel, and with other federal, state and local agencies. Assistance is provided to CDOT when addressing technically complex or controversial issues on general or project specific applications related to environmental policy and interagency coordination.

It is also FHWA's responsibility to ensure environmental requirements are properly satisfied on individual projects. FHWA reviews and approves all environmental documents (project categorization requests, NEPA documents, wetland findings, Section 106 compliance, and Section 4(f) Evaluations, etc.), with the exception of approvals delegated under the "Programmatic Agreement between CDOT and FHWA for the Review and Approval of Certain NEPA Categorically Excluded Transportation Projects".

### **3.1.5. Quality**

FHWA and CDOT review all environmental documents, attend public hearings and other project development meetings as necessary, and monitor news articles to assess the quality of work being planned and developed by CDOT. In addition to internal coordination, CDOT and FHWA will work with other state and federal reviewing agencies, Indian Tribes, local and regional governments, and the general public to ensure that their views on the environmental function are considered in developing areas for quality improvement.

Under the Stewardship Agreement, CDOT and FHWA personnel work together as partners to continually review, evaluate, and improve the environmental program. The main emphasis areas of the Agreement are strengthening the environmental function by sharing information and correcting identified weaknesses. The FHWA Env PM (or other designee) will be a member on the Environmental Advisory Committee (EAC). The CDOT Environmental Program Branch Manager

and the FHWA Env PM will host quarterly meetings with Region environmental personnel to share information, improve the quality and consistency of the various CDOT regional offices, and instill an environmental ethic throughout the agency.

Annually, CDOT and FHWA should sponsor an Environmental Training Workshop for all Regional and Headquarters environmental personnel. The purpose of the workshop is to provide training on new requirements and refine expertise on various resource issues. In addition, National Highway Institute (NHI) courses and special training will provide training to the Regions on specific environmental programs. Agencies with special expertise are invited to participate in training for the CDOT/FHWA environmental program.

Information that documents the environment program will be kept current as information sources permit. CDOT's Policies and Procedures Manual and NEPA Manual will be continually improved on a resource-by-resource basis as necessary and appropriate. The list of Intergovernmental Agreements listed on CDOT's website <http://www.coloradodot.info/programs/environmental/resources/agreements> will be reviewed and regularly updated. FHWA's Standard Operating Procedure for NEPA and Section 4(f) Review and Approval will be continually updated as laws, regulations, policies and procedures change and as FHWA HQ produces new materials. In addition, information on water quality and CDOT's Municipal Stormwater Discharge Permit will be available on CDOT's website.

Proposed review areas will be included as recommendations to the CDOT/FHWA Quality Improvement Council and become a part of the overall CDOT/FHWA Stewardship program.

The following performance indicators will help assess the health of the Environmental Program:

**Table 3 - Performance/Compliance Indicators (Environment)**

SAP #	Indicator	Description	Reporting Mechanism	Target/Baseline	Reporting Frequency
N/A	<b>Completion time for environmental documents</b>	The time to complete an EA from 45 days after the date of the initial Coordination Letter through the FONSI date and the time to complete an EIS from Notice of Intent (NOI) to Record of Decision (ROD)	A list of all EAs and EISs completed in the calendar year identifying the length of time along with a project description as added to previous years data	Track trend	Calendar FY <b>Quarterly reporting</b>
104, 381-382	<b>Active and completed NEPA documents</b>	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 (CE, EA, EIS) as added to previous years data	Track trend	Calendar FY <b>Quarterly reporting</b>

### 3.1.6. Performance/Compliance Measures

The following performance measures will help assess the health of the Environmental Program:

**Table 4 - Performance/Compliance Measures (Environment)**

SAP #	Measure	Description	Reporting Mechanism	Target/Baseline	Reporting Frequency
424	<b>Environmental Protection Agency (EPA) EIS ratings</b>	The rating that EPA provides on draft EIS documents	A list of DEIS documents completed in the calendar year identifying the EPA rating along with a project description	0, No EU ratings <sup>1</sup>	Calendar FY <b>Quarterly reporting</b>
102	<b>Percent on time for clearance actions by EPB</b>	Percent of the clearance actions sent from Regions to EPB that were completed on time as negotiated by the regions	Environmental clearances, document and project reviews, and plan development/reviews completed by EPB prior to deadlines, quarterly	90%	State FY <b>Quarterly reporting</b>
103	<b>Wetland impact and replacement ratios</b>	Ratio of replacement area to impacted area (statewide aggregate)	Identify and document replacement ratio by calendar year	A minimum of 1:1 wetland replacement	Calendar FY
99	<b>Water quality measure</b>	RECAT (or equivalent in new MS4 permit) findings resolved or addressed within 48 hours of midnight following the finding	Chief Engineer Objective	95-100%	State FY

<sup>1</sup> EPA rates EIS documents from best to worse as: LO (Lack of objections), EC (Environmental Concerns), EO (Environmental Objections), and EU (Environmentally Unsatisfactory) – the EU Rating means that the proposed action must not proceed as proposed; the others can proceed, some with modifications but they can be mitigated.

**Table 5 -FHWA Required Action List (Environment)**

Environment					
#	Activity	Authority	Action	Frequency	Delegated To
1	Class of document determination	23 CFR 771.115 Thru - 119	R & A	As submitted by CDOT RPEM	OE, Env PM and PDDL
2	Logical termini determination	23 CFR 771.111(f)	R & A	As submitted by CDOT RPEM	OE, Env PM and PDDL
3	Filing of Notice of Intent	23 CFR 771.123	R & A	As submitted by CDOT RPEM	OE and Env PM
4	Non- Programmatic Categorical Exclusion	23 CFR 771.117	R & A	As submitted by CDOT RPEM	OE
5	Environmental Assessment	23 CFR 771.119	R & A	As submitted by CDOT EPB or RPEM	PDDL
6	Finding of No Significant Impact (FONSI)	23 CFR 771.121	R & A	As submitted by CDOT EPB or RPEM	PDDL
7	Draft Environmental Impact Statement (EIS)	23 CFR 771.123	R & A	As submitted by CDOT EPB	DA

Environment					
#	Activity	Authority	Action	Frequency	Delegated To
8	Final EIS	23 CFR 771.125	R & A	As submitted by CDOT EPB	DA
9	Record of Decision (ROD)	23 CFR 771.127	R & A	Min. 30 days after publishing final EIS	DA
				As submitted by CDOT EPB	
10	Written re-evaluations or re-evaluation forms	23 CFR 771.129	R & A	As submitted by CDOT EPB or RPEM	For EISs – DA For EAs & CEs - OE
11	Section 4(f) <i>de minimis</i> or programmatic	23 CFR 774	R & A	As submitted by CDOT EPB or RPEM	Env PM or OE
12	Section 4(f) individual	23 CFR 774	R, A, F to USDOJ	As submitted by CDOT EPB	PDTL
13	Section 106 adverse effects and MOUs	23 CFR 771.133	R, A, F to ACHP	As submitted by CDOT EPB	Env PM
14	Tribal Consultation	36 CFR 800.2(c)(2)(ii)(A)	R, A, F to Tribes	As submitted by CDOT EPB Cultural Resources SM	Env PM
15	Section 7 consultation	23 CFR 771.133	R, A, F to USFWS	As submitted by CDOT EPB	Env PM
16	Wetland Findings	23 CFR 777	R & A	As submitted by CDOT EPB	Env PM
17	Annual reporting of wetland impacts and mitigations (Due 9/1 to FHWA HQ)	23 CFR 777	R, F to HQ	Annually by CDOT EPB Wetland PM	Env PM
18	Annual reporting of T & E Expenditures (Due 3/1 to FHWA HQ)	ESA	R, F to HQ	Annually by CDOT EPB T&E PM	Env PM
19	Annual reporting on noise walls (Due 11/1 to FHWA HQ)	23 CFR 772	R, F to HQ	Annually by CDOT EPB Noise PM	Env PM
20	Reporting on EPA EIS Ratings, and EIS timeliness (as EISs are completed or when 3 yrs have passed since last document)		R, F to HQ	As submitted by CDOT EPB	Env PM
R = Review, A = Approve, F = Forward. RPEM - CDOT Regional Planning and Environmental Program Managers, EPB - CDOT Environmental Programs, DA - FHWA Division Administrator, Env PM - FHWA Environmental Program Manager, OE - FHWA Operation Engineers, PDTL - FHWA Program Delivery Team Leader, PM - Program Manager.					

## 3.2. RIGHT-OF-WAY

### 3.2.1. Introduction

The acquisition of private property for public use is governed by a host of state and federal rules and regulations. The Right-of-Way (ROW) Program has overall responsibility for the acquisition, management, and disposal of real property on Federal-aid projects. This responsibility includes assuring that acquisition and disposals are made in compliance with the legal requirements of the state and federal laws and regulations.

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

- Surveying;
- Appraisals/Review;

- Acquisition;
- Relocation; and
- Property Management.

Notes:

1. Property Management is a part of the Maintenance & Operations Branch at the Central Office; however, some of the regions have a property management section that reports to the Region ROW Manager, not project development.
2. The Access Coordinator and the Roadside Advertisement Coordinator are part of Safety & Traffic Engineering at the Central Office.

### **3.2.2. Method of Operations**

The FHWA Colorado Division's relationship with CDOT's ROW program has historically been a very close working relationship that strives to identify best practices and training opportunities, and maintain good communications. As such there are responsibilities on the part of each organization to foster good public relations while striving to adhere to the ultimate goal of building highways.

The operation from the agencies perspectives includes the maximum delegation of authority to CDOT. This offers the greatest possible innovation and flexibility to administer the ROW program. In this regard, the CDOT ROW Operations Manual is an important tool.

Coordination and oversight are maintained through an annual statewide ROW workshop involving all CDOT ROW program personnel and the FHWA's ROW Program Manager, quarterly ROW managers' meetings, and routine contacts in person, in writing and by phone, during the course of business. Contacts are normally between the CDOT ROW Program Manager (Central Office) and FHWA ROW Program Manager.

### **3.2.3. CDOT Organization**

The ROW program is headquartered in Denver and has offices in each of the five regions. It has a professional staff of real estate specialists, surveyors, appraisers, administrators, and others who deliver ROW projects.

The CDOT Central Office is responsible for facilitating the provisions of statewide policies and guidelines, conducting quality assurance, providing training and development, and technical assistance to the Regions in support of their responsibility for program delivery.

The ROW program is comprised of the following functions:

- Survey;
- Appraisal/Review;
- Acquisition;
- Relocation;
- Local Public Agency Oversight;
- Consultant Management;
- Property Management; and
- Records Management.

### 3.2.4. FHWA Organization

Oversight of the ROW program in the FHWA Colorado Division Office is the responsibility of the ROW Program Manager and the FHWA Operations Engineers assigned to each of the six CDOT regional offices. Their primary responsibility, in addition to those listed in the matrix on page 16, is to review, interpret and provide guidance and training for FHWA ROW policies, procedures and regulations.

### 3.2.5. Quality

Quality Control (QC) is performed in four functional areas within the CDOT ROW process documented in the FHWA approved CDOT ROW Manual. First, a ROW plan review is held at the beginning of the appraisal process to determine the adequacy of the ROW plans and reduce the potential for possible plan revisions during the process. Second, all appraisals are reviewed by CDOT staff to provide assurance that all state and federal laws are complied with in the appraisal function. Third, all relocation determinations are approved by CDOT Central Office ROW staff prior to making an offer to the displaced person. Finally, a check list is used with each settlement package to make sure that all matters affecting title have been taken care of prior to closing.

Additionally, to encourage process consistency and ensure that the end product or service provided meets established quality standards and criteria, quarterly intra-region file reviews are performed by CDOT Region ROW staff. The review topics are function specific (appraisal, relocation, acquisition, etc.) and are determined by a consensus of CDOT ROW Managers, CDOT Central Office ROW staff and FHWA.

Quality assurance reviews of critical areas will be made on a rotational basis based on the risk assessment made by the CDOT ROW Program Manager and the FHWA Division ROW Manager.

The following performance indicators in combination with periodic reviews will be used to assess the health of the ROW program:

**Table 6 - Performance/Compliance Indicators (ROW)**

SAP #	Indicator	Description	Reporting Mechanism	Target/Baseline	Reporting Frequency
319	<b>Conditional clearances</b>	Percentage of Federal-aid projects with conditional ROW certifications	A list of conditional clearances	Track trend	State FY
320	<b>Condemnations</b>	Percentage of parcels acquired using condemnation	Uniform Act relocation Assistance and real Property Acquisition Statistical report as required by 49 CFR, Appendix B	Track trend	State FY
322	<b>Fair market value settlement rate</b>	The percentage of parcels settled at FMV	Calculation of the number of parcels that settled at FMV versus the total number of parcels acquired	Track trend	State FY
321	<b>Appeals</b>	The number of appeals filed each year	A list of appeals	Track trend	State FY

### 3.2.6. Performance/Compliance Measures

The following performance measures in combination with periodic reviews will be used to assess the health of the ROW program:

**Table 7 - Performance/Compliance Measures (ROW)**

SAP #	Measure	Description	Reporting Mechanism	Target/Baseline	Reporting Frequency
426	ROW customer survey	ROW agent customer service rating	ROW customer service survey by Region	Achieve very good or better in all categories	State FY

**Table 8 - FHWA Required Action List (ROW)**

Right-Of-Way					
#	Activity	Authority	Action	Frequency	Delegated To
1	State ROW Manual changes	23 CFR 710.201	R & A	Jan. 1, 2001 & every 5 years thereafter	RWPM
2	Requests for waivers	49 CFR 24.204(b)	R & A	As submitted by State	RWPM
3	Local Public Agency Oversight	23 CFR 710.201(h)	Periodically R for C (State takes action)	As needed	RWPM
4	FHWA Annual Acquisition and Relocation Statistics Previous form FHWA 1434, 1424	FHWA Order 6540.1	Prepare & submit to FHWA HQ	Annually by Nov. 15	RWPM
5	Use of ROW Air Space authorization request (on Interstate system)	23 CFR 710.405	R & A	Project by project	RWPM
6	Use of ROW Air Space authorization request (off Interstate system)	23 CFR 710.405	Periodically R for C (State takes action)	As needed	RWPM
7	Changes in Access Control / ROW Disposal authorization request (if on Interstate system or fair market value not charged) (1)	23 CFR 710.401 & 409	R & A	Project by project	RWPM
8	Changes in Access Control / ROW Disposal authorization request (if not on Interstate system and fair market value charged)	23 CFR 710.409	Periodically R for C (State takes action)	As needed	RWPM
9	Functional Replacement	23 CFR 710.509	R & A	Project by project	RWPM
10	Outdoor Advertising policies and procedures revisions	23 CFR 750.304	R & A	As needed or submitted by State	RWPM
11	Outdoor Advertising sign removal projects	23 CFR 750.307	R & A	Project by project	RWPM
12	Lead Agency Uniform Act monitoring activities	49 CFR 24.603	R for C	As needed	RWPM
13	Develop ROW oversight agreement	23 CFR 710.201(i)	R & A	By Jan. 1, 2001 and updated as needed	RWPM
14	ROW Conditional Clearance Certification	23 CFR 635.309	R & A	Project by Project	PDBM
15	ROW Plan Authorization	23 CFR 710.201 (i)	R for C & A	Project by Project	SPPM
16	Hardship and Protective Buys	23 CFR 710.503	R & A	Project by project	RWPM
17	Highway Facility Relinquishment, highway superseded on new location, old removed from federal-aid route	23CFR620.203(c)(1)	R & A	Project by Project	DA
18	Highway Facility Relinquishment of reconstructed local facilities outside control of access	23CFR620.203(c)(2)	Periodically R for C (State takes action)	Project by Project	RWPM
19	Relinquishment of Frontage Roads not integral to operations of system (frontage road in Interstate ROW)	23CFR620.203(c)(3)	R & A	Project by Project	RWPM
20	Relinquishment of Frontage Roads not integral to operations of system	23CFR620.203(c)(3)	Periodically R for C (State	Project by Project	RWPM



Right-Of-Way					
#	Activity	Authority	Action	Frequency	Delegated To
	(frontage road NOT in Interstate ROW)		takes action)		
21	Relinquishment of Frontage Roads used as access between ramps and public streets. (On Interstate System)	23CFR620.203(d)(1)	R & A	Project by Project	RWPM
22	Relinquishment of Frontage Roads used as access between ramps and public streets. (OFF Interstate System)	23CFR620.203(d)(1)	Periodically R for C (State takes action)	Project by Project	RWPM
23	Relinquishment of Ramps (On Interstate System)	23CFR620.203(d)(2)	R & A	Project by Project	RWPM
24	Relinquishment of Ramps (OFF Interstate System)	23CFR620.203(d)(2)	Periodically R for C (State takes action)	Project by Project	RWPM
(1) Changes in the Access control mean both breaks in an access control line and changing the location of an access control line. Changes in the Access control lines on the Interstate that are caused by a FHWA Oversight Project or an Interstate Access Request are considered approved by FHWA when FHWA approves the FHWA Oversight Project or approves the Interstate Access request (IAR) R = Review, A = Approve, C = Compliance RWPM - FHWA ROW Program Manager, PDBM - CDOT Project Development Branch Manager, SPPM - CDOT Survey/Plans Program Manager					

### 3.3. SAFETY AND TRAFFIC ENGINEERING

#### 3.3.1. Introduction

The Traffic and Safety Engineering Branch (The Branch) is responsible for developing and maintaining the Highway Safety Improvement Program (as defined by 23 CFR 924) for CDOT and is focused on reducing fatalities and serious injuries resulting from crashes on the transportation system and the associated human and economic loss.

The Branch focuses on implementing the Highway Safety Improvement Program (HSIP) which includes the Strategic Highway Safety Plan (SHSP), hazard elimination, and high risk rural roads and works with the Project Development Branch on rail-highway grade crossings. The Branch works with Region 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 analysis is employed to ensure that the most beneficial and cost-effective safety projects are selected for implementation by the Regions and local agencies.

The Rail-Highway Grade Crossing program (23 U.S.C. 130) uses an agreed upon procedure for project selection in accordance with 23 C.F.R. 924. In addition, grade crossing accidents are tracked with the help of law enforcement agencies and other Branch resources to respond quickly to accident sites to ensure that any safety issues are addressed.

The Branch also acts as the State's repository for state highway traffic crash information. The Branch administers both NHTSA and FHWA funding to improve the accuracy, completeness, timeliness, and availability of the data after receiving the crash records from the Department of Revenue. The Branch serves on and carries out the strategic plan of the STRAC (Statewide Traffic Records Advisory Committee), made up of representatives from the Colorado Departments of Transportation, Revenue, Public Health and Environment, Human Services, Public Safety, The Office of Information Technology, as well as the Judicial Branch. Crash data serves as the foundation in planning safety mitigation projects and programs.

The Office of Transportation Safety (OTS) administers the state's traffic safety program funded by the National Highway Traffic Safety Administration (NHTSA). Both the Branch and the OTS are jointly responsible for developing and maintaining the FHWA-mandated Strategic Highway Safety Plan. This strategic safety plan is the roadmap for developing the annual Colorado Integrated Safety Plan (ISP). 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 focuses of the program include reducing impaired driving related traffic deaths, motorcycle and pedestrian fatalities and increasing adult seat-belt use. Public information and outreach activities are coordinated along with training and education services.

The Safe Routes to School program is administered by the Division of Transportation Development and therefore outlined in the Planning section of this agreement.

### **3.3.1. Method of Operation**

The Stewardship Agreement describes activities of the FHWA Division Office and CDOT in implementing the required safety program activities. These activities are required under the HSIP (23 USC 148), which encompasses the SHSP, the High Risk Rural Roads Program (HRRRP) and the Rail/Highway Crossing Program (23 USC 130). Activities consist of components of planning, implementation, evaluation and reporting of safety programs and projects and providing support for problem identification, design, construction, maintenance, and technical assistance to CDOT, FHWA, the Federal Motor Carrier Safety Administration (FMCSA), NHTSA, Federal Transit Administration (FTA), Federal Railroad Administration (FRA), and local governments.

The Rail-Highway Grade Crossing program (23 U.S.C. 130) utilizes a hazard index for project selection in accordance with 23 C.F.R. 924. In addition, grade crossing accidents are tracked with the help of law enforcement agencies and other Branch resources to respond quickly to accident sites to ensure that any safety issues are addressed.

### **3.3.2. CDOT Organization**

The OTS will administer the non-infrastructure safety programs including the Colorado ISP which incorporates all safety program funding. This plan will identify the overall state safety objectives and the programs and resource allocations to be implemented annually to reach these objectives.

The CDOT Traffic and Safety Engineering Branch will administer the infrastructure safety programs in collaboration with the Regional Traffic Sections. These programs include HSIP, work zone safety and mobility, the flagger program, and various standards, specifications, manuals, and other references related to traffic engineering and safety (such as MUTCD, Highway Safety Manual, CDOT Standard Plans and Drawing). The Region Traffic Sections are responsible for the development of safety project scopes, schedules and budgets, delivering the safety projects, implementing safety recommendations on all projects as applicable, developing or reviewing work zone traffic control plans, signing, striping, and other traffic control device plans. The Traffic and Safety Engineering Branch is primarily responsible for the design and standards for safety hardware devices used in construction projects, directing the safety assessment functions, assisting the Regions with the selection of safety projects, facilitating the Regions in the development of policies and procedures, providing and/or coordinating technical training and assistance, and overseeing the safety quality assurance effort.

### **3.3.3. FHWA Organization**

The Colorado Division Safety and Traffic Operations Engineer works in conjunction with CDOT in the areas of safety and traffic operations. This involves promoting and providing guidance on new national initiatives for increasing safety, decreasing the potential for accidents on all highways, minimizing the number of serious injuries and reducing fatalities. The new Highway Safety Improvement Program (HSIP) established by SAFETEA-LU is a core program. The new safety program provides funding to CDOT for the HSIP and Rail-Highway Grade Crossing Programs. FHWA has responsibility for approving the processes developed and set forth in CDOT's HSIP. Additional FHWA responsibilities, which are delegated to CDOT, include offering assistance to local governments in performing traffic engineering studies, and providing training and technical assistance to CDOT employees, Bureau of Indian Affairs (BIA) personnel and local agency personnel.

### **3.3.4. NHTSA Organization**

The highway safety programs outlined in 23 CFR Part 1205 are eligible for federal funding under the State and Community Highway Safety Grant Program (23 U.S.C. 402). The Section 402 Safety Program is administered by NHTSA on the national level and by the Governor's Highway Safety Representative (currently the CDOT Executive Director) at the state level. Programs developed under these guidelines are eligible for federal funding issued by NHTSA and FHWA. NHTSA is responsible for FHWA's portion of Section 402 that involves program oversight, eligibility, and administrative activities. FHWA's role is to provide technical assistance and support when appropriate. OTS is responsible for the day-to-day administration of this program. NHTSA is primarily responsible for approval of the statewide ISP for the Roadway Safety Program area of Section 402 and management and program reviews.

### **3.3.5. Quality**

Quality is ensured by CDOT through evaluation of safety cost effectiveness and/or value derived from the safety programs and projects as reported in the Annual HSIP reports. The continuous quality improvements process of the Traffic and Safety Engineering Branch and Problem Identification conducted by OTS are used to prioritize limited funds to determine which initiatives have the greatest impact on highway safety in the areas of engineering and human factors (behavior). The quality is enhanced through collaboration with others to include FHWA who provides technical assistance for the HSIP and individual projects. Quality is monitored through ongoing operations and the Regional and project oversight that consists of work zone traffic control reviews, process reviews, scoping reviews, and Quality Assurance Reviews.

The processes of this program are documented in 23 CFR, along with CDOT procedural directives and policies, operational guidelines, etc. This information is shared with those that need to understand how the process operates. In addition, meetings are an integral and critical method of process and operational communications.

Traffic Control Reviews: CDOT Area Engineers, with the support of Staff Traffic Engineers, Region Traffic Engineers, and FHWA Operations Engineers will jointly conduct annual traffic control reviews to monitor traffic control on construction projects to ensure conformance with established regulations, policies, procedures, and guidelines.

Work Zone Safety and Mobility Process Reviews: The Branch, with the support of the FHWA Safety Program Manager, will comply with Section 23 CFR 630.1008(e) which states that “In order to assess the effectiveness of work zone safety and mobility procedures, the States shall perform a process review at least every two years”.

### 3.3.6. Performance/Compliance Measures

The following performance measures will be used to assess the health of the Safety and Traffic Engineering Program:

**Table 9 - Performance/ Compliance Measures (Safety and Traffic Operations)**

<b>SAP #</b>	<b>Measure</b>	<b>Description</b>	<b>Reporting Mechanism</b>	<b>Target/Baseline</b>	<b>Reporting Frequency</b>
343	<b>Reduce the total number of fatalities</b>	Total number of fatalities (5 year average)	Colorado Highway Safety Program Annual Report/Quarterly	Reduce previous 5 year annual average by 12 fatalities	Calendar FY
329	<b>Reduce total fatalities per VMT</b>	The fatality rate per 100 million VMT	Colorado Highway Safety Program Annual Report	5 year average of 1 per 100 million VMT	Calendar FY <b>Quarterly reporting</b>
435	<b>Reduce total number of serious injuries</b>	Total number of serious injuries (5 year average)	Colorado Highway Safety Program Annual Report	Reduce 5 year annual average by 100 serious injuries	Calendar FY
335	<b>Reduce the total serious injuries per VMT</b>	Reduce the total serious injuries per 100 million VMT (5 year average)	Colorado Highway Safety Program Annual Report	Reduce 5 year annual average rate to less than 25	Calendar FY
336	<b>Reduce alcohol-related fatal crashes</b>	Alcohol-related fatal crashes as a percentage of overall fatal crashes	Colorado Highway Safety Program Annual Report	Less than 45%	Calendar FY
376	<b>Reduce crash data processing time</b>	Number of months crash data processing is backlogged	Colorado Highway Safety Program Annual Report/Quarterly	Less than 6 months	Calendar FY <b>Quarterly reporting</b>
476	<b>Implement proven safety countermeasures</b>	Countermeasure Index Reporting score	Colorado Highway Safety Program Annual Report/quarterly	3 or better	Calendar FY <b>Quarterly reporting</b>
477	<b>Rural road fatality rate</b>	Per MAP21, if rate increases over previous two year period, HSIP funds must be reallocated to rural roadways	Colorado Highway Safety Program Annual Report/Quarterly	Reduce fatalities from previous two year average	Calendar FY
478	<b>Older driver fatalities and serious injuries</b>	If older driver fatalities and serious injuries per capita for drivers and pedestrians over 65 increase over previous two years, state shall set strategies in SHSP to change trend.	Colorado Highway Safety Program Annual Report/Quarterly	Reduce fatalities and serious injuries from previous two year average	Calendar FY

**Table 10 - FHWA Required Action List (Safety and Traffic Operations)**

<b>Safety Program</b>							
#	Activity	Reference	Action	Frequency	Due	Responsible Mgr.	Outcome
1	Strategic Highway Safety Plan	23 CFR 924.9 (a)(ii) 23 CFR 924.13 (2)	R, C & A	Every 3 years or as deemed necessary	June 30	CDOT	Updated SHSP
2	Highway Safety Improvement Program, including Safety Programs, High Risk Rural Roads Program	23 CFR 924.15 SAFETEA-LU 23 USC 148	R, C & A process	Annually	Aug. 31	CDOT/STE	Report to HQ by Sept. 30
3	Rail Highway Grade Crossing Program	23 USC 130	R C & A	Annually	Aug. 31	CDOT/STE	Report to HQ by Sept. 30
4	Work Zone Safety & Mobility Process Review	23 CFR 630.1008	R & A	Every 2 years	Jan 1, 2015	CDOT/STE	Report to D.A.
5	MUTCD Adoption and Colorado Supplement	23 CFR 655.603	R & A	2 yrs. after MUTCD update is released	---	CDOT/STE	MUTCD Adopted
6	Project crash data	23 CFR 630.1008	R	Continuous	---	CDOT/STE & OE	
7	Primary Seat belt law	23 CFR 1215.6	R	Annually (Each FY)	---	OTS	Colorado does not have a primary seat belt law
8	Drug offender DL revocation or suspension certification by Governor	23 USC 159, 23 CFR 192.5	R & C	Annually	Jan. 1	OTS	Certification sent to FHWA
9	Repeat Offender law	23 USC 164, 1406	C, A (if anything changes)	Update as amended		OTS	No update in compliance
10	Zero tolerance law & enforcement certification	23 CFR 1210.5	R	Update as amended	---	OTS	No update in compliance

R = Review, A = Approve, C = Compliance  
 AE – CDOT Area Engineers, CDOT – CDOT Safety and Traffic Engineering Branch, CTMC – Colorado Transportation Management Center,  
 DTD – CDOT Division of Transportation Development, ITS - FHWA ITS/ program Manager, OE - FHWA Operation Engineers, OTS – CDOT Office of Transportation Safety, STE - FHWA Safety/Traffic Engineer

### 3.4. Design and Construction

#### 3.4.1. Introduction

##### Design

The CDOT Design Program Manager is responsible for assisting the CDOT Regions to maintain uniform practices in design including the usage of guidance documents and manuals, plan sheet production, training, and project management practices. The Design Program Manager also provides design related technical support to the region personnel.

### Construction

The CDOT Area Engineers are responsible for assisting the CDOT Regions to maintain uniform contract administration and management practices in construction. In addition, the Area Engineers are responsible for providing technical assistance to the Regions. The Construction Area Engineer positions are a part of the CDOT Contracts & Market Analysis Branch.

#### **3.4.2. Method of Operation**

The CDOT Design Program Manager, the CDOT Area Engineers, and FHWA provide oversight, technical assistance, support, training, and quality assurance to the Region personnel to ensure uniformity of construction, design, and contract administration.

#### **3.4.3. CDOT Organization**

1. CDOT Design Program Manager: The Design Program Manager provides roadway design and pre-construction project management related support and ensures consistency for the Region and Headquarters personnel. The Design Program Manager position resides in the Project Development Branch.
2. Area Engineers: The CDOT Area Engineers provide construction related support and assure consistency for the region personnel. The Area Engineers are each assigned to different Regions of the State. The regional assignments are rotated annually. The Area Engineers are supported by Assistant Area Engineers. The Area Engineer positions and associated support staff reside within the Contracts and Market Analysis Branch.
3. Standards and Specifications Engineer: The CDOT Standards and Specifications Engineer (SSE) is responsible for developing and maintaining CDOT's Standard Plans, Standard Specifications, Standard Special Provisions and assisting in maintaining various engineering support documents and manuals. The SSE also reviews project special provisions and coordinates efforts related to statewide findings in the public interest (FIPI's). The SSE and associated support staff reside in the Project Development Branch.
4. Innovative Contracting Program Manager: The Innovative Contracting Program Manager is responsible for developing and updating CDOT's policies and procedures for project delivery methods outside the realm of Design-Bid-Build (e.g. Design-Build and Construction Manager/General Contractor). This position also provides technical assistance in determining the most appropriate project delivery method and development of procurement documents. This position resides in the Project Development Branch.
5. CDOT Regions: A Region Program Engineer is responsible for the overall design and construction program in part of each Region. The residencies in each Region report directly to a Region Program Engineer. Each residency is staffed by a Resident Engineer, Project Engineers, and other project personnel who are responsible for the day-to-day operations of the design and construction program.

#### **3.4.4. FHWA Organization**

The Program Delivery Teams in the FHWA Colorado Division are responsible for design and construction oversight including: design, contract administration, contract administration, contract changes, dispute resolution and claims, materials and pavements, specifications and quality

assurance oversight. The teams consist of a Program Delivery Team Leader who has leadership responsibility for the team, Operations Engineers, and other Program Managers. The Operations Engineers work on project oversight directly with the Resident Engineers in the Regions. There is a Program Delivery Team Leader who is responsible for working with the Project Development Staff Branch Manager on the Design Program and a Team Leader that works with the Contracts and Market Analysis Branch Manager on the Construction Program.

### 3.4.5. Quality

CDOT and FHWA plan program-wide implementation of Quality Control (QC) activities. The CDOT Design Program Manager, the CDOT Area Engineers, FHWA Operation Engineers, and the Regions will cooperate to ensure that effective QC procedures are established and carried out for design and construction activities.

Following are some of the cooperative QC activities:

- Post Construction Reviews: Post Construction reviews will be conducted in half of the Regions each year. The Design Program Manager assists the regions in coordinating their post-construction reviews. FHWA Operations Engineers will be invited to attend reviews on oversight projects;
- Inter-Region Reviews: Inter-Region reviews will be conducted in half of the Regions each year. The Area Engineers assist the regions in coordinating their inter-region reviews. The respective FHWA Operations Engineer will be invited to attend the reviews;
- Change Orders: The Area Engineers will track Change Order activities on projects and report on the quantity and dollar impacts to projects:
  - Number of change orders with time/schedule impacts
  - Number of change order requiring a funding letter
  - How many requiring FHWA approval
  - How many requiring CDOT approval.
- Disputes and Claims: The Area Engineers will track Dispute and Claims activity on projects and report on the quantity and cost impacts to projects.
  - Dispute dollars divided by total contract dollars
  - Claim dollars disputed divided by total contract dollars
- Revisions Under Advertisement: The construction contracts award unit will annually track and report revisions under Ad activities and trends. This data is not required for any performance indicators but will be reported as a part of section 3.14, Contracting, Engineering Estimates and Other Support, of the Stewardship Agreement Annual Report.
- Value Engineering: The Design program Manager will annually track the fulfillment of Value Engineering assessments and report on cost-benefits to the Department.
- Constructability Reviews: The Design program Manager will annually track constructability review activities on projects.

- Innovative Contracting Project Delivery: The Innovative Contracting Program Manager will track use of the Project Delivery Selection Matrix and Innovative Contracting use. On an annual basis CDOT will report the number of projects that utilized the selection matrix, number of projects that used innovative delivery methods, and the associated dollar value of the innovative delivery projects.
- Annual Residency Visits: The CDOT Design Program Manager, the Area Engineers, and the FHWA Operations Engineers will meet annually with the Resident Engineers and their personnel. These Residency visits are intended to provide a valuable exchange of information and ideas between CDOT Project Development staff, FHWA and Region personnel. In addition, the reviews will help to improve the QC function;
- Area Engineers/Design Program Manager/FHWA Program Delivery Team Leader Meetings: The Project Development Branch Manager, Contracts and Market Analysis Branch Manager, Area Engineers, Design Program Manager, and FHWA Program Delivery Team Leaders will meet on a quarterly basis to discuss issues of mutual concern in the design and construction program;
- Committees: The Area Engineers, Design Program Manager, Standards and Specification Engineer, Innovative Contracting Program Manager and FHWA will participate on the following committees:

CDOT Area Engineers and FHWA

- Joint Colorado Contractor's Association/CDOT Specification Committee;
- Joint American Concrete Paving Association/CDOT Coop Committee;
- Joint Colorado Asphalt Paving Association/CDOT Coop Committee;
- Project Delivery Advisory Committee;
- Materials Advisory Committee;
- Water Quality Advisory Committee

CDOT Design Program Manager and FHWA

- Project Delivery Advisory Committee

CDOT Standards and Specifications Engineer and FHWA

- Project Delivery Advisory Committee,
- Materials Advisory Committee,
- Joint Colorado Contractor's Association/CDOT Specification Committee

CDOT Innovative Contracting Program Manager and FHWA

- Innovative Contracting Advisory Committee

- Guidance Manuals: CDOT documents its design and construction procedures through the Project Development, Construction, and Design Manuals. These manuals are kept on the CDOT web page and are updated periodically. The Area Engineers and the Design Program Manager prepare interim design and construction bulletins as necessary for revisions and clarifications to the design process and procedures. In addition to being distributed electronically, these bulletins are also on the CDOT web page. All employees have access to the manuals and bulletins.



The following performance indicators will be used to assess the health of the Design and Construction Programs:

**Table 11 - Performance/ Compliance Indicators (Design and Construction)**

SAP #	Indicator	Description	Reporting Mechanism	Target/ Baseline	Reporting Frequency
465	Revisions under Advertisement	Percent of projects that have one or more Revisions under Advertisement	CDOT Work Plan	Establish baseline and track trend	State FY
466	Constructability reviews	Number of projects that include a constructability review during the design phase	CDOT Work Plan	Establish baseline and track trend	State FY
323	Number of major change orders	Number of change orders which required FHWA approval	CDOT Work Plan	Establish baseline and track trend	State FY
328	Number of change orders approved by CDOT	Number of change orders which did not require FHWA approval	CDOT Work Plan	Establish baseline and track trend	State FY <b>Quarterly reporting</b>
324	Number of claims paid out after DRB process followed	Claim dollars disputed divided by total contract dollars	CDOT Work Plan	Establish baseline and track trend	State FY
325	Number of disputes filed each year	Contract dollars disputed divided by total contract dollars	CDOT Work Plan	Establish baseline and track trend	State FY

### 3.4.6. Performance/Compliance Measures

The following performance measures will be used to assess the health of the Design and Construction Programs:

**Table 12 - Performance/ Compliance Measures (Design and Construction)**

SAP #	Measure	Description	Reporting Mechanism	Target/ Baseline	Reporting Frequency
464	Value Engineering (VE) Reviews	The percentage of projects over \$40 million in which a Value Engineering Assessment was completed	CDOT Work Plan	100%	State FY
345	Time to close a project from final acceptance to project closure in FMIS	Average # of days to close a project	CDOT Work Plan	200 days	State FY

**Table 13 - FHWA Required Action List (Design and Construction)**

Design and Construction							
#	Activity	Phase	Authority	Action	Frequency	Delegated To	
						Non-PoDI	PoDI
1	Project Authorizations (FMIS) Preconstruction	DES	23 CFR 630.106	R & A	Project by project	OE	OE
2	Consultant Services	DES/ CON	23 CFR 172.5	R & A	As needed	RE	OE

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Design and Construction							
#	Activity	Phase	Authority	Action	Frequency	Delegated To	
						Non-PoDI	PoDI
3	Approve Design RFP's	DES	23 CFR 635.112, 23	R & A	As needed	RE	OE
4	Projects Near Airports	DES	23 CFR 620.103	R & A	As requested project by project	RE	OE/RE
5	Highway Facility Relinquishment	DES	23 CFR 620.203	R & A	As needed	DA	DA
6	Railroad Agreement	DES	23 CFR 646.216	R & A	As requested project by project	RE	OE/RE
7	Buy America waiver (all projects)	DES	23 CFR 635.410	R & A	As needed	DA	DA
8	Design Exception Request	DES	23 CFR 625.3	R & A	As needed	RE	OE (PDTLs Mainline Interstate)
9	Plans, Specifications, & Estimates (PS&E)	DES	23 CFR 630B, 23 CFR 633.102 23 USC 106	R & A	Project by project	RE	OE
10	Competitive Bidding	DES/ CON	23 CFR 635.104, 23 USC 112, 23 CFR 635B	R & A	As requested	RE	OE
	Exceptions (Force Account)	DES/ CON					
11	Competitive Bidding Exceptions not defined by 23CFR635B	DES/ CON	SEP - 14	R & A	As requested	DA	DA
		DES/ CON	SEP - 15				
12	Warranties	CON	23 CFR 635.413	R & A	As needed	RE	OE
13	Convict Produced Material	DES/ CON	23 CFR 635.417	R & A	As needed	RE	OE
14	Patented/Proprietary Products Certifications (1)	DES/ CON	23 CFR 635.411	R & A	As needed	SSE	SSE
15	Patented/Proprietary Products (Finding in Public Interest)	DES/ CON	23 CFR 635.411	R & A	As needed	RE	OE
16	Public Agency Furnished Material	DES/ CON	23 CFR 635.407	R	As needed	RE	OE
17	Use of Public Owned Equipment	DES/ CON	23 CFR 635.106	R & A	As needed	RE	OE
18	Authorization to Advertise - Construction (FMIS)	DES	23 CFR 635.309	R & A	Project by project	OE	OE
19	D/B and CM/GC RFP	DES/ CON	CFR 636.109	R & A	Project by project	RE	OE
20	Advertisement Period	DES	635 112(b)	R & A	Project by project	CMABM	OE
21	Addenda During Advertisement	DES	635 112(c)	R & A	Project by project	RE	OE
22	Bid Opening/Tabulations	DES/ CON	23 CFR 635.113	Periodically R for C (State takes action)	Per letting	CMABM	RE
23	Concurrence in Award	DES/ CON	23 CFR 635.114, 23 USC 112(d)	R & A	Project by project	CMABM	OE
24	Subcontract Process	CON	23 CFR 636.116	R & A	One time	CE	PDTL
25	Rejection of all bidders	DES/ CON	23 CFR 635.114 (h)	R & A	Project by Project	CMABM	OE
26	Changed Conditions	CON	23 CFR 635.109	R & A	As needed	RE	

Design and Construction							
#	Activity	Phase	Authority	Action	Frequency	Delegated To	
						Non-PoDI	PoDI
	Changes and Extra Work	CON	23 CFR 635.120, 121	R & A	As needed	RE	
	Major CMOs	CON	23 CFR 635.120, 121, 102	R & A	As needed	RE	OE
	Non-major CMOs	CON	23 CFR 635.120	R & A	As needed	RE	RE
27	Dispute Review Board Recommendations	CON	23 CFR 635.124	R & A	As needed	RE	RE
	Claims	CON				OE	OE
28	Termination of Contract	CON	23 CFR 635.125	R & A	As needed	Chief Engineer	OE
29	Construction Inspection	CON	23 CFR 637	R for C	As needed	RE	RE
30	Final Inspection/Final acceptance	CON	23 CFR 637	R & A	As needed	RE	OE
31	Payroll	CON	23 CFR 635.118	R	As needed	RE	RE
32	Liquidated Damage Rates	CON	23 CFR 635.127	R & A	Every 2 years	PDBM	PDTL
33	Design Standards/ Standard Specifications	DES	23 CFR 625	R & A	When changes occur	Standards and Specifications Engineer	Spec Program manager
34	Value Engineering (all projects >\$40 M)	DES	23 CFR 627 and P.L. 104-59 Sec 303	R for C (State conducts study)	Project by project	RE	OE
35	Year-End Value Engineering Report	DES	23 CFR 627 and P.L. 104-59 Sec 303	R & send to HQ	Annually by Nov. 1	PDTL	PDTL
36	Emergency Repair/Projects	DES/CON	23 CFR 635.204	R & A	As requested	SE	SE
37	Utility Agreement Alternate Procedure	DES/CON	23 CFR 645.119	R & Accept	One time	PDTL	PDTL
38	Utility Accommodation Policy	DES/CON	23 CFR 645.215	R & A	When changes occur	PDTL	PDTL
39	Railroad Agreement Alternate Procedure	DES/CON	23 CFR 646.220	R & A	One time	PDTL	PDTL
40	Defense Access Roads	DES/CON	23 CFR 660 Part E	R	As needed	OE	OE
41	Local Public Agency Oversight Policies & procedures	DES/CON	23 CFR 635.105	R & A	As updated	PDTL	PDTL

R = Review, A = Approve, C = Compliance  
 OE - FHWA Operations Engineers, RE - CDOT Resident Engineer; DA - FHWA Division Administrator, ADA - FHWA Assistant Division Administrator, PDTL - FHWA Program Delivery Team Leaders, SE - FHWA Structural Bridge C&MA BM - Contract and Market Analysis Branch Manager, DES - Design, CON - Construction  
 PD BM - Project Delivery Branch Manager, CE - Chief Engineer SSE - CDOT Standards and Specifications Engineer  
 FHWA assumes responsibility for the oversight projects and CDOT assumes responsibility on all other projects.  
 (1) The SSE will certify that no suitable alternative exists. If suitable alternatives exist, a finding in the public interest (FIPI) must be written to justify use. (Refer to the Project Development Manual for more information\_

### 3.5. HYDRAULIC DESIGN

#### 3.5.1. Introduction

CDOT Region Hydraulic Engineers (RHEs) are responsible for the hydraulic design and review of bridges, culverts and roadside drainage. The RHE coordinates with many agencies involved with flood plain issues. The Staff Hydraulic Engineer (SHE) provides leadership, training, guidance and represents CDOT as the technical authority for hydraulics. The FHWA Division Bridge Engineer or Operations Engineer is the primary contact for the Division for hydraulic related issues.

### 3.5.2. Method of Operation

FHWA will review bridge culverts and bridges for hydraulic conformance to State and Federal design requirements for all interstate projects. FHWA may review minor structures and other hydraulic features at their discretion. FHWA Bridge Engineer will coordinate directly with the SHE with FHWA requests and training announcements.

### 3.5.3. CDOT Organization

The RHE's are responsible for hydraulic designs for roadway drainage, culverts, bridges, water quality sediment ponds, detention basins, open and closed channels. They provide water quality and environmental support and provide expertise for drainage issues in their region. Also the RHE provides leadership for erosion and sediment control mitigation, bridge scour, channel improvements and coordinates with the Federal Emergency Management Agency (FEMA), Colorado Department of Public Health and Environment (CDPHE), US Army Corps of Engineers (USACE) and regional floodplain administrators with water and floodplain issues. Additionally, the RHE reviews developers' consultant drainage design plans and reports for potential impacts to state highway right of ways.

The SHE represents CDOT as the technical authority by coordinating training, developing policy guidance, maintaining the Drainage Design Manual and fostering hydraulic related research. The SHE also represents CDOT for hydraulics at American Association of State Highway and Transportation Officials (AASHTO), Urban Drainage and Flood Control District (UDFCD), Colorado Association of Stormwater and Floodplain Managers (CASFM) and other technical organizations. The SHE is the manager of the current consulting project to update the plan of actions for scour critical bridges statewide. The SHE will coordinate bi-yearly status meetings with FHWA, Staff Bridge and Regions.

### 3.5.4. Quality

The Staff Hydraulics provides the Drainage Design Manual available to the public through the CDOT web page. The RHE will have their project drainage designs and reports reviewed independently; either by a consultant or other outside source. FHWA and the SHE can request a hydraulic report from the Region for their review at their discretion. FHWA and the SHE will meet annually and make recommendations to the QIC for future related QA's involving hydraulics.

### 3.5.5. Performance/Compliance Measures

The following performance measure will be used to assess the health of the Hydraulics Program:

**Table 14 - Performance/Compliance Measures (Hydraulics)**

SAP #	Measure	Description	Reporting Mechanism	Target/Baseline	Reporting Frequency
236	<b>Update the Scour Plan of Action for all scour critical bridges</b>	The percentage of scour critical bridges (NBI Item Code 113 Code 2, 3 or U) that have had plan of actions updated after 2008.	Staff Bridge annual asset management reports	100%	State FY  <b>Quarterly reporting</b>

**Table 15 - FHWA Required Action List (Hydraulics)**

<b>Hydraulics</b>						
#	Activity	Authority	Action	Frequency	Delegated To	
					CDOT	FHWA
1	Location and Hydraulic Design of Encroachments on Flood Plains	23 CFR 650 Subpart B	R & A	As needed	RE or RHE	OE or BE
2	Procedures and Fees for processing Map changes	44 CFR Part 72	C	As needed	Re or RHE	OE or BE
R = Review, A = Approve, C = Compliance OE - FHWA Operations Engineers, RE - CDOT Resident Engineer; RHE = Regional Hydraulics BE = FHWA Division Bridge Engineer FHWA assumes responsibility for the following on oversight projects and CDOT assumes responsibility on all other projects						

### 3.6. PAVEMENTS AND MATERIALS

#### 3.6.1. Introduction

The Materials and Geotechnical Branch is responsible for ensuring quality in the products used for construction and maintenance of the 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 programs in this Branch include Soils and Rockfall, Geotechnical Engineering, Concrete and Physical Properties, Asphalt Pavements, Pavement Management, and Pavement Design.

#### 3.6.2. Method of Operation

CDOT and FHWA will work together as partners to review the materials, pavement, and geotechnical programs, verify procedures, and provide solutions to identified problem areas. This working relationship requires teamwork across functional boundaries in FHWA and CDOT. The utilization of outside resources, such as industry groups and organizations, will be considered in this joint effort.

#### 3.6.3. CDOT Organization

1. Soils and Rockfall Program: The mission of the Soils and Rockfall Program is to perform laboratory tests on soils according to established guidelines and procedures for CDOT, maintaining an AASHTO Materials Reference Laboratory (AMRL) accredited soils laboratory. The Soils and Rockfall Program consists of the Soils Laboratory and the Rockfall Engineering Unit.

The following are also performed:

- Provide support, review and project management for the development of design plans and specifications concerning soil and rockfall projects;
- Provide geologic hazards expertise by assessing safety, recommending mitigation alternatives and inspecting mitigation construction;
- Provide emergency geological service for CDOT projects;
- Update and administer the Rockfall Management Plan;

2. Geotechnical Engineering Program: The mission of the Geotechnical Engineering Program is to provide geotechnical recommendations for the design, construction and maintenance of CDOT projects involving roadway cut and fill, bridge, retaining wall, and other transportation structure foundations. The Geotechnical Program works side by side with the Soils and Rockfall Program to evaluate geotechnical and geological hazards such as embankment and slope failures, landslides, sink holes and debris flows among others, as they affect safety and mobility,. The Program also manages CDOT's geotechnical drilling operations and installs geotechnical instrumentation for long term monitoring.
3. Concrete & Physical Properties Program: The mission of the Concrete and Physical Properties Program is to provide timely and accurate test results for concrete, aggregate, steel, and other construction and maintenance materials. This program provides statewide Portland cement concrete coordination through engineering and technical expertise that will assist the Regions in the development of the Department's transportation system to meet the structural condition goals for bridges and the surface condition goals for pavement established by the Transportation Commission. This Program consists of the concrete and steel testing unit, the aggregate testing unit, the pavement deflection and smoothness testing unit, the radiation safety unit, , and engineering support.

The primary products include review of concrete mix designs, production and quality assurance testing, and concrete design specifications for aggregates and concrete. Quality assurance of many materials listed as COC or pre-inspection is included;

4. Asphalt Program: The mission of the Asphalt Pavement Program is to provide timely and accurate asphalt mix and binder testing, ensure high quality of CDOT asphalt mix and binder testing statewide, and provide engineering and technical expertise in the development, selection, application, construction, testing and maintenance of asphalt mix and binder materials that will assist the Regions in the development of the Department's transportation system to meet the surface condition goals established by the Transportation Commission. The Asphalt Pavement Program consists of the Bituminous and European Laboratory, the Flexible Pavement Laboratory, Chemical Unit and the Asphalt Engineering Unit.

Products of this program include production and assurance testing of asphalt mix and binder and the development of mix design specifications and testing procedures. They also include QA testing of asphalt binders and emulsions, development of specifications, including performance-graded binders, and testing of mixtures using European and performance testing methods. In addition, specifications for Hot Mix Asphalt (HMA) and other asphalt mixtures are reviewed and developed;

5. Pavement Management Program: The Pavement Management Program functions to implement the most cost effective surface treatment and pavement maintenance program possible. The primary function is to create planning tools to be utilized in development of the Department's transportation system such that it meets the surface condition goals established by the Transportation Commission.

The primary products and function of the Pavement Management Program include:

- Network level pavement management condition and funding recommendations,

- Project level pavement management procedures,
  - Completion of the annual pavement surface condition survey and analysis of the results at both the network and region levels,
  - Quality assurance of condition data collection,
  - Provide project recommendations and report on matching percentage of projects constructed by Regions,
  - Provide training relevant to pavement management and preventive maintenance,
  - Provide technical expertise regarding improvements to procedures and policies relevant to pavement management;
6. Pavement Design Program/Documentation Unit: The mission of the Pavement Design Program is to give technical expertise in the development of pavement designs and statistical materials acceptance specifications, offer technical expertise to all appropriate personnel, and provide statewide support for the Site Manager Materials and Laboratory Information Management System software used for construction project management, including training, technical assistance, and reporting while being responsive to customer needs in a timely and professional manner.

The primary products of the Pavement Design Program include:

- Development of pavement design procedures,
- QC&QA specification development,
- Engineering software support,
- SiteManager Materials and Laboratory Information Management System support
- QARs of pavement construction projects (as needed)

The Documentation Unit is part of the Pavement Design Program. It oversees and maintains AMRL and CCRL Certification Records for the Materials Branch. Also, this unit ensures compliance with AASHTO Designation R- 18 and updates and maintains the AASHTO Accreditation Program Quality System Manual. This Unit maintains the records of Certification for the Annual Region Laboratory Inspection of testing equipment and reviews the Assurance Sampling and Testing Program to assure compliance with Title 23, CFR, Part 637, Subpart B. It also provides materials documentation training and quality assurance review of materials documentation and final materials certification. This Unit is also responsible for publication and currency of the CDOT Field Materials Manual, Pavement Design Manual, and the Laboratory Manual of Test Procedures.

#### **3.6.4. FHWA Organization**

The FHWA Colorado Division has assigned one engineer the primary responsibilities associated with the stewardship and oversight of the Pavements and Materials program. The Division Pavement/Materials Engineer is the lead contact for: Pavement Management and Design, as well as the Asphalt and Materials Programs. The Division Bridge Engineer will handle: Structural Concrete, as well as the Rockfall and Geotechnical Programs. The Division Operation Engineers will resolve project issues with CDOT Project Managers with consultation when necessary with the Division Pavement/Materials Operation Engineer.

The Division will provide technical assistance to CDOT in the development of material and pavement specifications and provide quality assurance reviews of the programs.

### 3.6.5. Quality

CDOT and FHWA individuals responsible for materials and geotechnical engineering conduct a variety of activities to ensure quality control and assurance of these programs.

1. Training: Training programs have been developed for QC / QA software, pavement design and life cycle cost analysis, materials for managers, concrete paving inspection, and testing and documentation for the inexperienced. Training for asphalt paving inspection has been developed in cooperation with the Colorado Asphalt Pavement Association (CAPA) and are currently offered through the Rocky Mountain Asphalt Education Center at CAPA. Training for concrete paving inspection has been developed in cooperation with the Colorado Ready Mixed Concrete Association and the American Concrete Paving Association (CRMCA) and are currently offered through the CRMCA.
2. Manuals: The primary manuals within the Branch include the *Field Materials Manual*, the *Pavement Design Manual*, the *Laboratory Manual of Test Procedures*, and the *Pavement Management Manual*. These manuals are updated annually and there is a regularly scheduled meeting each year to review the contents and update the materials within each manual. There are two other manuals, the *Radiation Safety Manual* and the *Rockfall Manual*, which are updated from time to time as needs exist, or approximately every three to five years.
3. Specification Development: In order to influence quality, the Materials Advisory Committee meets a minimum of five times per year. FHWA, CDOT HQ staff subject matter experts, and each Region Materials Engineer meet to discuss and resolve issues relating to specifications. As part of this effort, the Independent Assurance Testers and the Flexible Pavement Operators meet once or twice per year to identify and resolve issues that impact this program. CDOT Annually meets with the Four Corner States' (AZ, NM, CO, UT) DOT materials engineers to collaborate on shared technical issues.

CDOT meets a minimum of three times per year with CAPA, the Colorado / Wyoming Chapter of the American Concrete Pavement Association and the Colorado Ready Mixed Concrete Association. FHWA attends when available. Specifications are updated and improved through partnering based on lessons learned from all of the parties.

4. Process Reviews: Joint Process Reviews, as part of the Stewardship Agreement with FHWA, can be periodically conducted with HQ staff, the Regions, FHWA, and industry representatives across a range of technical areas including concrete pavement, structural concrete, HMA, pavement management and geotechnical engineering. Areas of potential risk will be identified by the QIC and prioritized in the QIC's Joint Process Review/Risk Response Strategies annual effort.
5. Materials Acceptance: Material production of HMA and PCCP in the Regions is measured by quality levels (QC / QA programs) and through the assurance-testing program.
6. Laboratory Accreditation: The Materials and Geotechnical Branch is an AASHTO accredited laboratory for tests relating to bituminous materials, asphalt mix, soils, reinforcing steel, concrete and physical properties.



7. **Region Oversight:** Every three years the CDOT Materials and Geotechnical Branch conducts quality reviews of each Region Materials Unit regarding their Independent Assurance Programs and the materials final certifications.

Every year the Branch conducts a quality review of each Region Materials Unit laboratory to ensure that equipment is calibrated and checked. Further, proficiency samples are tested annually by HQ and Region laboratories on soils, concrete and asphalt. The average test results and rating of each lab is reported.

8. **Technician Certification:** All technicians performing acceptance testing are required to be certified. Certification programs, approved by FHWA, exist for asphalt, concrete, and soils. The administration of each certification program is the responsibility of CDOT partnering with Colorado Ready Mix Concrete Association (CRMCA) for concrete, Colorado Association of Geotechnical Engineers (CAGE) and Western Alliance for Quality Transportation Construction (WAQTC) for soils and the Colorado Asphalt Pavement Association (CAPA) for asphalt. There are quality checks within each of the certification programs to ensure they are effective. For example, CDOT and FHWA are active members of the Laboratory Certification of Asphalt Technicians (LabCAT) Technical Committee and LabCAT Board which oversee and direct continuous quality improvements to the technical training documents and statewide certification programs.
9. **Pavement Management System:** The Pavement Management Technical Committee meets a minimum of five times a year to identify and resolve issues with the Pavement Management System. The condition reports and maps are provided each September to the Transportation Commission and Asset Management Program in September. A functioning Pavement Management software setup is provided to the Regions in December so that the Regions can compile project recommendation lists for use in planning the Surface Treatment Program. Differences in condition or project selection, as recommended by the Pavement Management System from that observed by the Region, are categorized and work is undertaken to resolve these differences.

The following performance indicators will be used to assess the health of the Pavement and Materials Program:

**Table 16 - Performance/ Compliance Indicators (Pavements and Materials)**

SAP #	Indicator	Description	Reporting Mechanism	Target/ Baseline	Reporting Frequency
253	Percent of resurfacing projects matching recommendations of the Pavement Management Systems annual review <sup>1</sup>	Percent of resurfacing projects recommended by the Pavement Management System for each State fiscal year	Pavement Management Systems Work Plan	Track trend	State FY
255 & 259-264	Percent of surface treatment funds planned for pavement preservation within each region <sup>1</sup>	Percent of surface treatment funds planned for pavement preservation within each region (per Chief Engr Policy Memo 18)	Pavement Management Systems Work Plan	Track trend	State FY

<sup>1</sup> Due to the ongoing Pavement Management transition from the Remaining Service Life metric to the Drivability Life metric, these indicators can be calculated, but should be considered for information only. It is expected that full reinstatement of specific targets will be in time for the

2015 annual report. Previous targets were 70% of resurfacing projects matching recommendations of the Pavement Management Systems annual review and 5% of surface treatment funds planned for pavement preservation within each region.

The FY2014 Surface Treatment Plan (STP) of projects was primarily the product of established project delivery commitments with the final project list also refined through necessary Transportation Commission direction. The current DL PMS was not used to establish the FY2014 STP. PMS Match status represents simple comparison of the final FY2014 STP to current DL PMS recommendations, and is therefore well below target and historic levels. The percent of planned preventive maintenance is also below target and historic levels due to those final list revisions that removed lower cost projects.

### 3.6.6. Performance/Compliance Measures

The following performance measure will be used to assess the health of the Pavement and Materials Program:

**Table 17 - Performance/ Compliance Measures (Pavements and Materials)**

SAP #	Measure	Description	Reporting Mechanism	Target/Baseline	Reporting Frequency
254	<b>Percent of NHS pavements within Colorado with an IRI less than 95</b>	Percent of NHS pavements within Colorado have a good ride quality as defined by an IRI less than 95	Pavement Management System	52%	State FY

**Table 18 - FHWA Required Action list (Pavements and Materials)**

Pavements and Materials						
#	Activity	Authority	Action	Frequency	Delegated To	
					CDOT	FHWA
1	Materials Acceptance	23 CFR 637B	R & A	As needed	As needed	DBE DBE, DP/ME
2	Pavement Design Policy	23 CFR 626.3	R & A	As needed	As needed	DP/ME
R = Review, A = Approve, C = Compliance DP/ME = FHWA Pavement/Materials Engineer, DBE = Division Bridge Engineer						

## 3.7. STRUCTURES

### 3.7.1. Introduction

The Structures program is responsible for working with the Regions to ensure structures are properly designed, constructed, and maintained throughout the State. Structures include: bridges, culverts, overhead sign structures, luminaries and traffic signal structures, retaining walls, and sound walls. The staff of the Structures program develops and publishes structural designs, policies and standards including construction specifications, and evaluates new products and materials for bridge construction. The Structures program provides vital services: bridge management and inspection, fabrication inspection, construction assistance, and bridge rating and bridge overloads.

### **3.7.2. Method of Operation**

CDOT will provide the FHWA Division Bridge Engineer the following on oversight projects: structure selection reports, Field Inspection Review (FIR) plans and Final Office Review (FOR) plans. CDOT project managers shall provide final PS&E plans for all major bridges to FHWA for review and information.

FHWA will provide comments on any bridge at their discretion. The Bridge Design and Management Branch (Staff Bridge Branch) will provide written responses to any written FHWA comments. In the latter instance, the CDOT project manager will be copied, or, if requested by the project manager, responses to FHWA will be sent through the project manager. Foundation and hydraulic reports will be made available to FHWA. FHWA will monitor these reports through participation on all CDOT QA and QC teams reviewing these activities. The QA process will monitor construction inspections on projects.

The National Bridge Inventory (NBI), the new requirements under MAP 21, and previous National Highway Bridge (HBP) program funding will be monitored on a continuing basis with an annual review of all phases of the program (inspections, bridge posting, consultant overview, etc.) and by random reviews as determined appropriate by FHWA.

The FHWA Division Bridge Engineer and CDOT Staff Bridge Engineer will meet on a regular basis to discuss input into all assigned programs. The FHWA Structural Engineer will participate in regularly scheduled staff meetings of the Branch at his discretion.

### **3.7.3. CDOT Organization**

The Staff Bridge Branch is responsible for CDOT's policies on structure design and construction, bridge management and structural inspections. The Branch is responsible for load rating bridges, checking permits associated with vehicles weighing 200,000 lb. or greater, providing structural design and consultant review services to the Regions, as well as engineering services when emergencies occur and bridge repairs are warranted.

The Staff Bridge Branch provides assistance and structural engineering expertise to the Regions' construction and maintenance programs. This includes fabrication inspection services for structural members and products such as structural steel and precast concrete structural members, and specific types of expansion devices, bearing devices, overhead signs, and signals.

The Branch participates in and provides structural engineering expertise to the Department's non-project specific activities such as research teams, training committees, CAD committees, the specifications committee, and quality assurance review teams.

The Staff Bridge Structural Asset Management and Bridge Inspection Units maintain the NBI and PONTIS inventories. Structure inventory, asset management, and inspection data and reports are provided to other CDOT offices and FHWA. Staff Bridge is responsible for CDOT's bridge inspection teams, off system bridge inspection, bridge maintenance programming and tracking, and the Colorado off-system bridge program. In addition to bridges, Staff Bridge is responsible for CDOT's overhead sign, traffic signal, high mast light, minor bridge, and minor culvert inspection and inventory programs. Existing highway structures are inspected and evaluated for their integrity and major vehicle bridges are rated for their load carrying capacity.

The Staff Bridge Engineer represents the State nationally and is active with the AASHTO Subcommittee with Bridges, an organization that maintains the national design standards and policy for bridges. Also, the Staff Bridge Engineer is an influential participant of other national organizations and initiatives, such as the National Steel Bridge Alliance, Precast Concrete Institute and the High Performance Concrete initiative.

#### **3.7.4. FHWA Organization**

The FHWA Division Bridge Engineer (DBE) provides the oversight of all CDOT bridge programs and activities. These activities include the NBI, NBIS, HBP, the bridge management system, the preparation of project plans and specifications, the development of design and construction standards, as well as hydraulic, materials and geotechnical activities.

The FHWA Division Bridge Engineer provides leadership, overall quality assurance, and technical assistance to CDOT and the FHWA Division.

#### **3.7.5. Quality**

Staff Bridge provides and maintains several documents that are available to the public through the CDOT web page. The publications available include the: *PONTIS Bridge Inspection Coding Guide*, *Colorado Structure Inventory Coding Guide*, *CDOT Bridge Design Manual*, *CDOT Bridge Detailing Manual*, *CDOT Bridge Rating Manual*, *CDOT Bridge Worksheets*, and structures-related construction specifications.

The NBI and PONTIS data for all bridges is routinely reviewed for accuracy by Staff Bridge's quality control bridge inspector. Annually, FHWA and members of Staff Bridge's bridge inspection and asset management units will review at least twenty bridges, including local bridges, for accuracy of NBI and PONTIS data. FHWA will review inspection procedures and compliance of the NBIS by reviewing the 23 metrics standards as required by FHWA HQ's, and will report deficiencies to the Staff Bridge Engineer. The metric report will be completed by the end of the calendar year. CDOT will have until February 28 to respond to the deficiencies reported. The DBE will finalize the report by March 31 to FHWA HQ. Staff Bridge provides quality control for the NBI tape submittal to FHWA headquarters by checking the data and making any corrections before submitting the tape to FHWA. The quality control includes running FHWA's NBI checking software utility.

The annual bridge construction costs are submitted by Staff Bridge to the FHWA Division Bridge Engineer for review. (Comment: checking with HQ's to see if this is needed. May strike out later) FHWA will check costs for at least four bridges. Also with this submittal, FHWA will review unusual bids or award bids that are 15% over the Engineer's cost estimate. Unusual bids or line items with significant cost increases will be reported to the Staff Bridge Engineer by FHWA.

### 3.7.6. Performance/Compliance Measures

The following performance measures will be used to assess the health of the Structures Program:

**Table 19 - Performance/ Compliance Measures (Structures)**

SAP #	Measure	Description	Reporting Mechanism	Target/Baseline	Reporting Frequency
215	<b>Decrease the number of scour critical bridges</b>	Reduce the number of scour critical bridges per year over the last 5 years	Staff Bridge annual asset management reports	Downward trend	State FY
214	<b>Decrease the structurally deficient deck area</b>	Decrease the structurally deficient deck area per year over the last 5 years	Staff Bridge annual asset management reports	Downward trend (Always less than 10% per MAP-21)	State FY
216	<b>Decrease the structurally deficient deck area on the NHS</b>	Decrease the structurally deficient deck area on the NHS per year over the last 5 years	Staff Bridge annual asset management reports	Downward trend	State FY
238	<b>Reduce the backlog of essential repair activities recommended by Staff Bridge</b>	Percent of pending essential repairs based on the number of high priority (orange & yellow) repair recommendations pending	Staff Bridge annual asset management reports	15% or less	State FY
237	<b>Reduce the quantity of bridge expansion joints that are leaking</b>	Repair or replace joints noted as leaking or damaged per inspection reports	Staff Bridge annual asset management reports	Downward trend	State FY
467	<b>Decrease the number of structures with sub-standard vertical clearance</b>	Bridges under 16'-0" represent an increased risk of vehicle impact and restrict commerce. Remove or mitigate where possible.	Staff Bridge annual asset management reports	Downward trend	State FY
468	<b>Decrease the number of load restricted bridges</b>	Decrease the number of structures that cannot safely move commerce	Staff Bridge annual asset management reports	Downward trend	State FY
469	<b>Bridges requiring hydraulic reports</b>	Drainage report provided with new structure design where applicable	Completion of Hydraulic Report Form	100%	State FY
470	<b>Bridge Inspection Metrics Report</b>	Percentage of the 23 metrics in compliance	FHWA's Metric Compliance Report	100%	State FY
471	<b>Document support of Item 113 coding on the off-system scour critical bridges</b>	Obtain as much information on foundations of the off-system structure to justify item 113 coding	Staff Bridge annual asset management reports	Upward trend	State FY
472	<b>Perform new load ratings on off-system structures that contain advanced deterioration</b>	Rerate structures with components > 35% loss w/o repair	Staff Bridge annual asset management reports	Upward trend	State FY

**Table 20 - FHWA Required Action List (Structures)**

Structures Program					
#	Activity	Authority	Action	Frequency	Delegated to
1	NBIS Review Statewide report	23 CFR 650 Subpart C	R for C	Annually (date determined by Division)	DBE
2	HBP Unit Cost submittal & NBI tape submittal	23 CFR 650 Subpart D	R & A	Annually by April 1	DBE
3	HBP eligibility determinations	23 CFR 650 Subpart D	R & A	Project by project	DBE
4	TS & L and PS&E reviews (non-exempt projects)	23 CFR 630, 23 USC 106, and W.O. 11/13/98 memo	R & A	Project by project	DBE
5	Innovative Bridge Research and Construction Program eligibility determination	23 USC 503(b)	R & A and submit to HQ	Annually (date varies)	DBE
6	Construction inspections	23 CFR 637	R for C	As needed	DBE
R = Review, A = Approve, C = Compliance DBE - FHWA Division Bridge Engineer					

### 3.8. MAINTENANCE & OPERATIONS

#### 3.8.1. Introduction

CDOT has within the Central Office a Staff Maintenance and Operations (M&O) Branch. In support of the Transportation Commission’s stated Investment Categories of Program Delivery, Mobility, System Quality and Safety, the M&O Branch has two primary functions: 1) Providing policy and guidance for the state maintenance program, and 2) maintaining operational oversight for the administration of the maintenance program for the nine maintenance sections. The Branch Management will provide a liaison contact that will assist and oversee successful completion of the Methods of Operations.

#### 3.8.2. Method of Operation

The Staff M&O Branch and FHWA will assure that available resources are utilized effectively to assure compliance with federal requirements as defined in 23 CFR 635E.

#### 3.8.3. CDOT Organization

The M&O Branch is comprised of a series of program areas that provide a broad variety of services and support to CDOT. The M&O Branch program areas include:

1. Maintenance Training Academy: The MTA exists to provide a standardized training curriculum to ensure minimum levels of core competency for new hires, existing maintenance workers and supervisors.
2. Road Equipment Services: The Road Equipment Services program exists to administer the acquisition, maintenance and replacement of equipment across the regions and increase the department's ability to purchase and maintain equipment at the lowest possible cost.
3. Oversize/Overweight Permits: The work unit exists to administer a statewide transport permit program for extra-legal vehicles and loads in order to protect the traveling public and the state's infrastructure.
4. Maintenance Support and Levels of Service: The MLOS/MMS program analyzes and prepares the statewide Maintenance budget recommendations based on analysis of the MLOS for the M&O Branch Manager, Executive Management Team and Transportation Commission. This program also manages the statewide Adopt / Sponsor a Highway program to provide litter control on Interstate and State highways.
5. Property Management: This unit exists to provide a complete statewide Property Management System for all CDOT owned properties. This includes leasing, selling, trading, demolition of improvements, new construction, renovation, and hazardous/solid waste testing and cleanup. This unit provides professional services for management of all properties including clearing properties for highway construction.
6. Maintenance Engineering: This support activity is responsible for Maintenance Specifications, Maintenance Contracting (Maintenance-Jobs), liquid deicer materials testing and Avalanche/Weed Control. These programs exist to support the Regions in avalanche management, explosives management, and to provide statewide expertise in noxious weed management. This unit serves as liaison between CDOT and the Colorado Avalanche Information Center and the US Army on contract related issues. Additionally, this unit provides statewide explosive storage records depository by conducting audits and maintaining official files. This unit acts as a liaison between CDOT and the Colorado Dept. of Agriculture State Noxious Weed Coordinator.

#### **3.8.4. FHWA Organization**

The FHWA Maintenance Program Manager is responsible for the Maintenance Program. The Program Manager will coordinate with the CDOT liaison to assure that all pertinent federal requirements are met. FHWA Operations Engineers will perform random field surveys of their CDOT Regions, visit with maintenance superintendents, and make note of issues and concerns that pertain to their respective operations areas.

The FHWA Division Bridge Engineer handles the truck size and weight (S&W) program with the Colorado Department of Revenue (CDOR), State Patrol, Motor Carrier Safety Section and CDOT Oversight Overweight Permitting Section by coordinating quarterly meetings to discuss S&W issues and proposed federal or state regulations. The CDOR Port of Entry is the lead agency and handles the requirements of 23 CFR 657 by the following: Truck S&W enforcement plan by July 1, and enforcement certification before January 1. CDOR submits the enforcement plan and certification electronically to FHWA HQ website. The CDOR coordinates with CDOT and CSP to provide the

necessary data. The Division Bridge Engineer reviews and makes recommendations to the plan and certification for approval.

### 3.8.5. Quality

The M&O Branch utilizes the MLOS process that includes the annual review of 764 survey segments. In addition, the 764 segments are inspected real time during and after snow storms for levels of snow removal. This entire process develops and drives CDOT maintenance budgets.

The Branch and FHWA will participate in a number of the 764 survey segments. In addition, they will develop risk response strategies for selected issues. Also, the FHWA Field Operations Engineers will review their CDOT Regions with respect to the following critical elements (listed under 23 CFR 635.505): roadway surfaces, shoulders, roadside (e.g. vegetation management, erosion control, and liter pick-up), drainage, bridges and tunnels, snow and ice control, traffic control devices, safety appurtenances (e.g. guardrails, impact attenuators, breakaway supports, barriers, etc.), safety rest areas, access control, and traffic safety in maintenance and utility work zones.

The M&O process is documented in the 1997 Manual of Maintenance Procedure and the Management of Maintenance Systems.

### 3.8.6. Performance/Compliance Measures

The following performance/compliance measures will be used to assess the health of Maintenance and Operations Programs:

**Table 21 - Performance/Compliance Indicators (Maintenance and Operations)**

SAP #	Measure	Description	Reporting Mechanism	Target/Baseline	Reporting Frequency
271	Maintain the transportation system at the adopted annual MLOS grade	Annual MLOS adopted target grades for major Activity Groups 150, 200, 250, 300, 350, and 400	MLOS actual grades from annual survey	Statewide MLOS target achieved +/- one step	State FY
270	Maintain the snow and ice service MLOS grade at the adopted annual grade	Annual MLOS grade for snow and ice removal	MLOS reporting	Statewide MLOS target achieved +/- one step	State FY

**Table 22 - FHWA Required Action List (Maintenance and Operations)**

Highway Information					
#	Activity	Authority	Action	Frequency	Delegated To
1	Vehicle Size & Weight enforcement certification	23 CFR 657.13	R for C	Annually by Jan 1	DBE
2	Vehicle Size & Weight enforcement plan	23 CFR 657.11	R & A w/ evaluation report	Annually by July 1, w/approval by Oct 1	DBE
R = Review, A = Approve, C = Compliance DBE Division Bridge Engineer					



## 3.9. INTELLIGENT TRANSPORTATION SYSTEM (ITS) PROGRAM

### 3.9.1. Introduction

As mentioned in Section 1.2, MAP-21 builds upon many of the highway programs and policies that were established in previous Federal Transportation Bills. As it pertains to ITS the following core elements related to program areas have been codified into the Code of Federal Regulations (CFR):

- Traffic and Engineering Analysis – 23 CFR 940.11. Requires that all ITS projects that are funded in whole or in part with federal highway trust funds shall be subjected to a systems engineering analysis (SEA).
- Conformity with National ITS Architecture – 23 CFR 940.5. Requires that the National ITS Architecture be used to develop regional ITS architecture(s).
- ITS Regional Architecture – 23 CFR 940.9. Requires development of regional ITS architectures by April 8, 2005 and identifies elements that must be included in the architecture.
- Project Administration, ITS – 23 CFR 940.13. Requires that prior to authorization of federal highway trust funds for ITS projects compliance with SEA will be demonstrated.
- ITS Standards – 23 CFR 940.11. Requires that all ITS projects funded with federal highway trust funds shall use applicable ITS standards and interoperability tests that have been officially adopted through rulemaking by the USDOT.
- Congestion Management System – 23 CFR 500.109. Requires application of strategies to improve system performance and reliability by reducing the adverse impacts of congestion on the movement of people and goods in the region.
- Real-Time System Management System Information Program – 23 CFR Part 511. Requires that states implement systems to report roadway and travel conditions consisting of: construction and maintenance activities, roadway or lane blocking, roadway weather observations, and travel time or speed information on Interstate Highways by November 8, 2014 and on Routes of Significance by November 8, 2016, respectively.

The overall purpose of the ITS program is to use technology to enhance 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. This is accomplished by using devices, equipment and high-speed communications to monitor traffic conditions provide real-time travel speed and condition information, implement traffic management applications with ramp meters, traffic signals, HOV/HOT and managed lanes and coordinate incident management strategies with first responders, law enforcement and local agencies. In essence, all of this is done 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.

The overall purpose of ITS as a transportation application is to:

- Enhance and improve mobility by maximizing productivity and efficiency of the system through reduced travel time delay and variability and increased travel time reliability;
- Improve safety by detecting, verifying, responding to and clearing incidents faster through coordinated agency response and by implementing incident management plans in order to more efficiently manage traffic during incidents;
- Enhance intermodal connectivity and inter-jurisdictional coordination by promoting and supporting integration of state and local ITS systems.

### 3.9.2. Method of Operation

The ITS staffs of CDOT and FHWA work closely together to develop a quality product through teamwork, coordination and implementation for advancing the ITS program. This working relationship allows us to meet the needs of our customers, and provide technical assistance, guidance and oversight in applying federal laws and regulations, as well as technology development and deployment. These program activities include the use of ITS in transportation, methods and procedures used by traffic engineers to manage and operate roadways, and ITS standards and specifications used for the procurement of traffic control systems.

The ITS program coordination and oversight are maintained through ITS managers meetings, monthly DRCOG Regional Transportation Operations meetings and other ITS project related meetings involving CDOT ITS staff and FHWA's ITS Program Manager.

All projects (including ITS projects) that have Federal-aid funds, regardless of roadway classification, are subject to FHWA Full-Oversight. FHWA has developed certain factors, including workload distribution, which is considered to determine appropriate oversight level. Also, FHWA performs Program Accountability Reviews on Designated-Oversight projects, which could include ITS projects, based on certain risk areas identified in the previous Annual Construction Program Report.

In addition, ITS projects are required to conduct a Systems Engineering Analysis (SEA) commensurate with the scale and scope of the project, which is determined by the project risk assessment level. SEA is a structured process for arriving at a final design of a system and an approach to building systems that enhances the quality of the end result.

### 3.9.3. CDOT Organization

The CDOT ITS program was reorganized into the recently created Division of Transportation System Management and Operations, and two major program areas have been created:

1. ITS Branch
2. Real-Time Traffic and Incident Management Branch

The ITS Branch consists of the following five Sections whose primary responsibility is:

- **Technology** – Ensure that Colorado Transportation Management System, Cotrip.org, network equipment, servers and Oracle database functional properly and are operational 24/7.
- **Maintenance** – Perform maintenance on the statewide ITS infrastructure as effectively and efficiently as possible in order to ensure maximum operational functionality and best use of available resources.
- **Engineering** – Design and deliver high-quality projects, provide technical assistance and support to the Regions and other agencies.
- **System Performance and Support** – Develop, coordinate and manage performance measures, provide ITS asset programmatic oversight and promote strategic, coordinated and systematic implementation regarding statewide ITS deployment.
- **Traffic Signal and Ramp Meter Operations** – Operate traffic signals and ramp meters as effectively and efficiently as possible and integrate traffic signal and ramp meter operations to support freeway operations including corridor, event and incident management.

The Real-Time Traffic and Incident Management Branch is responsible for the dissemination of real-time statewide traveler information including monitoring and managing traffic incidents, scheduled events and congestion on high-priority Interstate highways and other highly-congested corridors. The Branch is responsible for the development of procedures, processes and protocols concerning dissemination of traveler information, which is done via the COTRIP website, HARs, 511 IVR phone system, faxes, DMSs Gov Delivery, VMSs, cell phones and coordination with other TMCs. The Branch assists in the development of all incident management plans for the purpose of managing traffic in a coordinated manner among pertinent jurisdictions during an incident. The Branch also performs operational functions remotely for local TMCs when their facilities are not staffed.

#### **3.9.4. FHWA Organization**

The FHWA ITS Program Manager leads the Division's efforts to mainstream ITS technology by continuing to increase the level of understanding of planners, engineers, officials and citizens within Colorado by providing awareness seminars, participation in ITS planning activities, and conducting or hosting technical training. In the Division, it is the responsibility of the ITS Program manager and the Operations Engineers assigned to each of the five regional CDOT offices to provide close project management and coordination. The Operations Engineer will routinely review the ITS aspects of FHWA oversight projects during the design and construction phases for conformance to approved standards, specifications, and procedures. Questions or concerns are brought to the ITS Program Manager's attention. The Operations Engineer will rely on the ITS Program Manager for technical expertise or interpretation of ITS policy requirements.

The ITS Program Manager will have the lead on all ITS Federally-funded projects. This responsibility will include project initiation, environmental clearances, design reviews, and periodic construction inspections. For oversight of ITS projects, it is important to distinguish and define what is an ITS project. An ITS project is defined as the application of technology devices, computers and communications infrastructure to address and solve transportation related problems. This includes the application of advanced technologies to control, manage, or otherwise provide guidance to the transportation public. Other examples include advanced traffic management systems, computerized traffic signal systems, advanced traveler information systems, etc.

#### **3.9.5. Quality**

To ensure quality within the ITS Program, FHWA actively participates in the Metropolitan Planning Organization's ITS working groups, and was instrumental in assisting CDOT and DRCOG with the development of the System Engineering Analysis Guidelines. As a condition of spending federal dollars on ITS projects, federal law requires that all ITS projects comply with the system engineering analysis process including all ITS architecture and standards requirements to assure successful implementation and quality of the project. FHWA participates in a technical manager's meeting that tracks the project's progress on an as-needed basis. This guarantees that the project is implemented in accordance with the project schedule and budget thereby ensuring quality. FHWA also participates in ITS Branch team meetings. This ensures that FHWA is aware of, and appropriately involved in, all planning level related ITS activities. The ITS Branch actively participates on the Quality Implementation Committee. In addition, FHWA participates in up to four Traffic Engineer meetings per year that are attended by CDOT Region Traffic Engineers who are also responsible for ITS projects in their respective Region.

### 3.9.6. Performance/Compliance Measures

The following performance measures will be used to assess the health of the ITS Program:

**Table 23 - Performance/Compliance Measures (ITS)**

SAP #	Indicator	Description	Reporting Mechanism	Target/ Baseline	Reporting Frequency
266	<b>Percent of congested corridors implemented with incident management plans</b>	Congested corridors (v/c > 0.85 on interstates and freeways) implemented with incident management plans as a percentage of all identified congested corridors	ITS Work Plan Performance Measures	32%	Calendar FY
352	<b>Percent of identified congested corridors where ITS solutions implemented</b>	Congested corridors (centerline miles at the > 0.85 level) where ITS solutions have been implemented as a percentage of all congested corridors	ITS Work Plan Performance Measures	78%	Calendar FY
268	<b>Percent of identified congested corridors with ramp metering implemented</b>	Congested corridors (v/c > 0.85 on interstates and freeways) with ramp metering implemented as a percentage of all identified congested corridors	ITS Work Plan Performance Measures	54%	Calendar FY
383	<b>Duration of Peak Period (morning and evening for I-70 West and I-25 South)</b>	Identify the peak period for I-70 West Golden to Frisco and I-25 South Lincoln to Colorado Springs and monitor durations	ITS Work Plan Performance Measures	Establish a baseline for FY 2014 <sup>1</sup>	State FY
384	<b>Number of incidents lasting over 90 minutes on I-70 West</b>	Measure the number of incidents lasting over 90 minutes on I-70 between Golden and Vail and look for trends to improve clearance times	ITS Work Plan Performance Measures	Establish a baseline for FY 2014 <sup>1</sup>	State FY
385	<b>Average Incident Closure time on I-70 West and I-25 South</b>	Measure the number of incident closures on I-70 between Golden and Vail and I-25 between Lincoln and Colorado Springs and monitor the length of the closures and look for trends to improve	ITS Work Plan Performance Measures	Establish a baseline for FY 2014 <sup>1</sup>	State FY
347	<b>COTRIP Web hits<sup>2</sup></b>	Measure the number of web hits, and page views in COTRIP and other pertinent data and look for trends to improve information consumption by the public	ITS Work Plan Performance Measures	1.75 billion hits	Calendar FY

SAP #	Indicator	Description	Reporting Mechanism	Target/ Baseline	Reporting Frequency
386	Courtesy Patrol Assists <sup>3</sup>	Measure the number of Courtesy Patrol Assists in the metro Denver area and report by type	ITS Work Plan Performance Measures	11,634 assists	Calendar FY

<sup>1</sup> These measures were recently added. Baseline fiscal year data will be available in June 2014.

<sup>2</sup> Web hits are one measurement that is used to determine web usage. Regarding the COTRIP web site, a hit occurs each time that an icon/button is accessed to request information.

<sup>3</sup> The Courtesy Patrol operates in the Denver Metro area on selected routes such as; US 6, I-25, US 36, I-70 and C 470, Monday through Friday during morning and afternoon peak periods. The assists include, but not limited to, the following services: accident, flat tire, fuel transfer, jump start, passenger transfer, and tow to drop site, used phone and water transfer.

**Table 24 - FHWA Required Action List (ITS)**

Intelligent Transportation Systems					
#	Activity	Authority	Action	Frequency	Delegated To
1	Traffic Engineering and Analysis	23 CFR 940.11	R & A	Traffic surveillance and control system projects	OE
2	Conformity with National ITS Architecture	23 CFR 940.5	R & A	ITS projects using Highway Trust	ITS PM
3	ITS Regional Architecture	23 CFR 940.9	R & A	Project by project	ITSPM
4	Project Administration - ITS	23 CFR 940.13	R & A	Project by project	OE
5	ITS standards	23 CFR 940.11	R & A	Project by project	ITS PM
6	Congestion management system	23 CFR 500.109	R for C	As needed/revised by MPO/State	ITS PM/CTMC
7	Incident Management Assessment		R & A	Annually	ITS PM
8	Real Time System Management	23 CFR Part 511	R,A,C	Annually	ITS PM/CTMC

R = Review, A = Approve, C = Compliance  
OE – FHWA Operation Engineer; ITS P M – FHWA ITS Program Manager, CTMC – Colorado Transportation Management Center

## 3.10. FINANCIAL MANAGEMENT

### 3.10.1. Introduction

Financial Management encompasses the entire Federal-aid program from the authorization through any phase (Environment, ROW, Preliminary engineering through construction and debt retirement). Oversight is performed in the areas of accounting processes, at the headquarters, regional business offices and project site visits. Monitoring obligation limitation and discussions on Federal-aid financing tools available is provided in an advisory role. Review of and input to the audits performed by and for CDOT ensure eligibility of Federal-aid funds.

### **3.10.2. Method of Operation**

FHWA and CDOT personnel maintain a cooperative working relationship in the administration and oversight of financial management. Communication and interaction between FHWA and CDOT occur routinely for the exchange of information, coordination of activities, and the resolution of issues in the financial management areas of Accounting, Budget, Audit, Obligation Control, Systems Integrity and Control and Process Reviews and Federal reimbursement.

### **3.10.3. CDOT Organization**

The following organizations have a direct impact upon the financial operations and subsequent reviews of financial data processed through established automated systems.

The Division of Accounting and Finance Office of Financial Management and Budget is responsible for the development and coordination of the Statewide Transportation Improvement Program, the Department's Budget, the federal obligation process, and overall financial management of the Department's resources. They also provide for the payment of vendors and employees, billings of accounts receivable, transaction reviews and edits to assure accuracy and eligibility of expenditures, project expenditure reviews and subsequent closure, federal aid billing, and financial reporting.

The Division of Audit performs contract compliance audits of vendors, contractors and consultants doing business with CDOT. The Division also conducts performance, process or internal control audits of CDOT operations to assure effectiveness, efficiency and compliance with rules and regulations. Audit is also evaluating the possible utilization of the FHWA Financial Integrity Review and Evaluation (FIRE) program risk assessment for performing an internal audit of the highest risk areas in a future work plan.

The State Auditors Office (SAO), or its contractor, performs an annual statewide financial audit to render an opinion on the financial condition of CDOT and its compliance with FHWA and state requirements. Such audits are performed to comply with the requirements of the single audit act. Audit emphasis areas are identified cooperatively with FHWA, CDOT and the SAO.

### **3.10.4. FHWA Organization**

FHWA provides the Federal-aid funds for highways and monitors usage of the funds with staff from the Division and National levels. FHWA staff also participates in risk response strategies and Regional or National reviews as appropriate. The FHWA FIRE plan requires certain reviews be conducted. The review may be conducted solely by FHWA or in conjunction with CDOT. The primary FHWA financial support comes from the Division's Finance and Administration Team, which includes a Financial Manager, a Financial Specialist and a Program Assistant.

### **3.10.5. Quality**

Successful financial management incorporates a series of processes adding value to the operation relative to available resources, time, and management philosophy. General emphasis areas include: improvements and enhancements to financial management systems and processes; assurances of compliance; improved control of funds; and adequate project management systems and reports. Quality control and assurance efforts embrace the philosophy of the National Quality Financial Management Initiatives.

The primary quality controls of the financial system are the edits and security that control the quality of outputs. Quality control efforts also consist of periodic process reviews conducted by selected staff from CDOT and/or single audit reviews. The reviews result in either an affirmation of the process or an identification of potential areas for improvement. They also provide an opportunity for identifying training needs.

CDOT and FHWA are committed to working together to provide improvements and enhancements to Financial Management Systems and Processes to:

- Ensure the integrity of the financial management system and to maximize the use of federal and state funds;
- Revise and streamline the financial management system so that each process adds value to the operation and incorporates the best practice;
- Assist in the identification and prioritization of improvement efforts through the results of the quality control process reviews, internal audits, and regular single audit reviews conducted by the State Auditor's Office. CDOT management and FHWA both have input regarding audit emphasis areas.

The process is documented in the Office of Financial Management and Budget Policy and Procedure Manual, dated August 19, 2010.

The following performance indicators will be used to assess the health of the Financial Management Program:

**Table 25 - Performance/ Compliance Indicators (Financial Management)**

SAP #	Indicator	Description	Reporting Mechanism	Target/ Baseline	Reporting Frequency
120	<b>Determine if there is a trend of the local agencies using a larger share of federal funds or if the local agencies are constructing an increased number of projects</b>	Percent of projects authorized for construction this year executed by local agencies or sub-grantees	SAP	Track trend	State FY
123	<b>Amount of Federal Aid funds obligated versus total available per fiscal year</b>	Percent of STIP projects obligated in the same year promised	STIP Obligation Report	Track Trend	State FY

### 3.10.6. Performance/Compliance Measures

The following performance measures will be used to assess the health of the Financial Management Program:

**Table 26 - Performance/Compliance Measures (Financial Management)**

SAP #	Measure	Description	Reporting Mechanism	Target/Baseline	Reporting Frequency
155	<b>Number of Design and/or Right of Way (ROW) projects that were paid for with federal funds and have not advanced to the construction phase within the time limits in CFR 620.112(c) 1 and 2 (Design 10 yr, ROW 20 yr)</b>	<p>(1) Determine all projects that have completed Design or Right of Way but have not gone to construction;</p> <p>(2) If projects have not gone to construction, determine which were constructed under another project number</p> <p>(3) If there are projects that have exceeded the CFR time limit, but a reasonable justification is made by CDOT and FHWA approves, the reason will be documented with a projected construction date. Otherwise FHWA will be entitled to a credit for the federal funds expended on the project;</p> <p>(4) Begin to move ahead by measuring projects at eight years for design and fifteen for ROW to ensure projects are constructed;</p> <p>(5) Data fields need to be populated in PSAM module of SAP to enable an automated reporting at any time</p>	FMIS (Fiscal Management Information System) and CDOT systems for projects authorized as part of the annual project	Less than 5%	State FY

**Table 27 - FHWA Required Action List (Financial Management)**

#	Activity	Authority	Action	Frequency	Delegated To
<b>Financial Program</b>					
1	Project Agreements	23 CFR 630 Subpart C	Approve	Submitted by CDOT Budget as needed	FM, FS, PA
2	Fed-aid billing reimbursement of eligible expenditures	23 CFR 140 and 635.122	R & A	As requested by CDOT Accounting	FM, FS, PA
3	Transfer of funds as requested by State	23 USC 104 (c) and 119 (f)	R & A	As requested by CDOT Budget	FM, FS
4	Federal Managers Financial Integrity Act Assurance Statement	Congressional Act 1982	Submit	Annually by Oct. 1	FM, FS
5	Quality Financial Management Initiative (QFMI) and Quality Assurance Reviews (QAR)	Memo HFS-40, 12/01/97	Encourage	Continuous	FM
6	State Infrastructure Bank Report	SIB Guidance 9/97 & Coop Agreement	R & S to HQ	CDOT submits to FHWA for FHWA HQ Annually by Dec. 31	FM



#	Activity	Authority	Action	Frequency	Delegated To
<b>Financial Program</b>					
7	Annual Update of the Major Project Financial Plan(s)	<a href="#">FHWA Financial Plan Guidance May 2000 &amp; Interim Dec 2005; MAP-21 Interim Major Project Financial Plan Guidance</a>	R & S to HQ, A and C	As required and according to initial plan for due dates	FM, FS
8	FIRE – Management Decision Letter on SW Annual Audit findings if any	<a href="#">FIRE Order 4560.1a</a>	R, C & S	Annually by June 1	FM, FS
9	FIRE – Grant Process Review	<a href="#">FIRE Order 4560.1a</a>	R, C & S	Annually by June 1	FM, FS
10	FIRE – Inactive Projects Review	<a href="#">FIRE Order 4560.1a</a>	R, C & S	Quarterly Dec 1, Mar 1, June 1, Sept 1	FM, FS, PA
11	Motor Fuel Tax (MFT) Evasion Project funds request	<a href="#">HQ memo soliciting applications</a>	R & A	Periodic (usually annually)	OK
<b>Highway Information</b>					
1	Highway taxes and fees report	<a href="#">HQ memo of request</a>	R for C and send to HQ	Annual for State system, Biannual for non-state system	STP
2	Monthly fuel report (PR 511M)	<a href="#">Chapter 2 of FHWA Guide to Reporting Highway Statistics</a>	R for C (State sends direct to HQ w/copy to Div.)	Monthly	STP
3	Heavy Vehicle Use Tax Payment Certification	<a href="#">23 CFR 669.7</a>	R for C and send to HQ	Annually by July 1	STP
4	Heavy Vehicle Use Tax Payment Review	<a href="#">23 CFR 669.21 &amp; 23 CFR 669</a>	Conduct	Every 3 years	STP
R = Review, A = Approve, C = Compliance S = Submit STP – FHWA Statewide Transportation Planner, SE – FHWA Structural Engineer FM – FHWA Financial Manager, FS - FHWA Financial Specialist, PA - FHWA Program Assistant.					

### 3.11. PLANNING

#### 3.11.1. Introduction

Colorado state law states that transportation planning is the responsibility of CDOT's Division of Transportation Development (DTD) and that it should be carried out in cooperation with internal and external planning partners and in compliance with federal laws and regulations (i.e., MAP-21; 23 CFR 420, 23 CFR 450, 23 CFR 460 and 23 CFR 470). The activities to be accomplished by DTD make up the framework of the annual State Planning and Research (SPR) work program, which is approved by FHWA. State Planning and Research funds are provided annually to CDOT and their programming is documented in the work program.

The Multimodal Planning Branch (MPB) within DTD supports strategic planning, policy development and analysis, and prepares Commission materials related to transportation development and planning. This Branch also oversees the planning process that includes both statewide and regional planning activities. As part of its responsibility for the transportation planning process and plan, MPB administers and coordinates its regional and statewide planning through the 15 TPRs, of which

there are five Metropolitan Planning Organizations (MPOs) and ten non-urban planning regions. In addition, MPB consults with the two Indian Tribes and various federal land management, wildlife and regulatory agencies on the development of the long-range transportation plan. The TPRs (MPOs and non-urban) develop long-range regional transportation plans, which are the basis for Colorado's Statewide Transportation Plan. The five MPOs also develop transportation improvement programs (TIPs) and the non-urban planning regions participate in CDOT's Project Priority Programming Process (4P) to prioritize projects for the Statewide Transportation Improvement Program (STIP). The Statewide Transportation Plan and the STIP are approved by the Colorado Transportation Commission and the STIP is forwarded to FHWA/FTA for approval. The approved STIP is used as the framework for the annual budget approved by the Transportation Commission. The Branch is also responsible for administering the Bike/Pedestrian programs and the Safe Routes to School (SRTS) and Scenic Byways programs.

For the MPOs, FHWA and FTA planning funds are allocated on the basis of a formula agreed upon by CDOT and the five MPOs. Based on expected funding, each MPO develops a Unified Planning Work Program (UPWP). The accomplishment of the UPWP is the responsibility of the MPO with CDOT MPB oversight and review. Mid-year reviews are conducted with each MPO by MPB and FHWA/FTA staff.

The MPB also manages the air quality conformity process required to meet the planning regulations and oversees the non-infrastructure Congestion Mitigation and Air Quality (CMAQ) program. The Environmental Programs Branch (EPB) in DTD manages air quality analysis at the project level.

MPB Liaisons work closely with MPOs and TRPs in developing regional plans, administering CPG funds, developing products within the UPWP, and also serve as members of the Technical Advisory Committee for each MPO. The Liaisons deal with political, financial and policy issues associated with the MPOs and TPRs on a regular basis and serve to represent CDOT Headquarters at the planning region meetings.

The Information Management Branch (IMB) prepares and submits highway information as required by the FHWA. This Branch has two sections: GIS and Mobility. The GIS/Data Management section is responsible for information management and data dissemination functions that contribute to the development of transportation plans, projects, and state/federal reports. CDOT program areas are supported with GIS applications, planning information, data analysis, mapping services, database programming and data integration. The Mobility section is responsible for traffic data collection, processing, analysis and dissemination. They are also responsible for the inventory of the state highway system, HPMS and road mileage certification, management of special studies, travel demand model technical support, and freight planning.

The Transportation Performance Branch (TPB) leads the performance measures and asset management programs, providing tools to effectively measure, analyze, forecast and communicate to management and stakeholders, the performance of CDOT's programs, processes, and investment decisions. This Branch prepares the strategic performance report for the legislature.

### **3.11.2. Method of Operation**

CDOT has responsibility for transportation planning per state statute (Title 43 Part 11 of Colorado Revised Statutes) and federal laws (23 USC 134 and 23 USC 135) and regulations (23 CFR 420, 23 CFR 450, 23 CFR 460 and 23 CFR 470). These laws establish the planning requirements to be conducted by CDOT in cooperation with internal and external planning partners. State law is consistent with federal law, ensuring that planning is conducted according to US DOT standards and

requirements. At a minimum the state must develop a comprehensive, multimodal 20-year transportation plan that integrates and consolidates the regional transportation plans developed by the urban and non-urban regions of the state and a four-year Statewide Transportation Improvement Program (STIP).

The MPB, IMB, TPB and FHWA/FTA work together closely and coordinate on issues pertaining to state and regional transportation planning in addition to monthly coordination meetings. These include:

- Strategic Planning
- Policy Development and analysis
- Performance Based Planning and Programming
- Development of Statewide and Regional Transportation Plans;
- Oversight of work in UPWPs;
- Bi-annual MPO certification;
- Development of annual SPR work program;
- Technical assistance to MPOs and TPRs;
- Air quality conformity;
- Planning and environmental linkages activities;
- Bike/pedestrian data collection and analysis;
- Freight planning;
- Data collection and reporting;
- Data management;
- HPMS;
- Travel demand forecasting;
- Traffic data analysis; and
- Other planning related activities.

### **3.11.3. CDOT Organization**

Located in Denver and housed within the DTD, MPB is comprised of three sections: Statewide Planning, MPO and Regional Planning, and Bicycle/Pedestrian/Scenic Byways/Safe Routes to School.

Also within DTD is the Information Management Branch which is responsible for roadway and traffic data collection and analysis, freight planning, and the GIS functions. The STIP is coordinated and prepared by the Office of Finance and Budget (OFMB) within CDOT. The Planning Branch staff works closely with the MPOs, TPRs, OFMB staff and Engineering Region planners to support the development of the STIP.

The TPB is responsible for performance measurement and reporting for CDOT.

### **3.11.4. FHWA Organization**

Within the Colorado Division, there is a Statewide Transportation Planner and an Urban Transportation Planner who are responsible for providing CDOT with technical assistance and oversight for all transportation planning and air quality activities. The planners are also responsible for route classification, highway statistics, and intermodal activities. Transportation planning responsibilities are broadly split between urban and statewide planning, although considerable overlap exists. The planners will be a part of the effort in the development of work activities

produced by CDOT and the MPOs. In addition, the planners will provide guidance, suggestions, and written comments on draft documents, review and provide comments on final products and provide technical assistance to state and local agencies.

### 3.11.5. Quality

CDOT works closely with FHWA, FTA and its planning partners to ensure quality material is prepared through cooperation and quality reviews and that the public has the opportunity to provide comment. The planning process includes development of plan documents in consultation with planning partners, land management agencies, regulatory agencies and Tribal governments, and review of plan documents by planning partners, Statewide Transportation Advisory Committee, Transportation Commission and the public.

CDOT and FHWA work together as partners to continually review, evaluate and improve the transportation planning process. CDOT works closely with the MPOs and sits on the technical advisory committees and in some cases the Board. CDOT will continue to work cooperatively with its internal and external planning partners to improve the process and provide guidance and assistance as needed. Monthly meetings are held with CDOT region staff and the STAC to discuss planning issues and, during the plan update cycle, to develop the State Transportation Plan.

### 3.11.6. Performance/Compliance Measures

The following performance measures will be used to assess the health of CDOT's Planning Program:

**Table 28 - Performance/Compliance Measures (Planning)**

SAP #	Measure	Description	Reporting Mechanism	Target/Baseline	Reporting Frequency
379	<b>Work program progress</b>	Percent of funds encumbered compared to the estimate of encumbrance for fiscal year	Feedback on annual review and tracking of percent complete on projects  Progress on the work program is in the FY Accomplishments Report	90% of planned amount	State FY
10	<b>TPR coordination</b>	CPG and Rural PO	Contracts executed by deadline	100% of contracts executed on time	Federal FY
85	<b>Accuracy and Timeliness of HPMS and other transportation data submitted</b>	Annual HPMS Report Card Score from FHWA HPMS Review	Annual HPMS Report Card Score	120	State FY

**Table 29 - FHWA Required Action List (Planning)**

#	Activity	Authority	Action	Frequency	Delegated To
<b>Statewide Planning</b>					
1	20-yr Statewide transportation plan	23 CFR 450.214	R for C	As updated	STP
2	4-yr STIP & amendments	23 CFR 450.216, 220	R & A w/ FTA	As requested by State (Federally mandated every 4 years)	STP
3	SPR and PL funded work programs	23 CFR 420	R & A	Annually by June 1	STP

FHWA Colorado Division and Colorado Department of Transportation  
Stewardship and Oversight Agreement

#	Activity	Authority	Action	Frequency	Delegated To
4	SPL/PL program accomplishment/expenditure reports	23 CFR 420.117(b)(1) & (c)	R for C and send to HQ	Annually by Sept. 30	STP
6	State certification of their planning process	23 CFR 450.218	R for C	In conjunction with STIP approval	STP
7	Public involvement for State planning process	23 CFR 450.210	R for C	As needed or as revised by State	STP
8	Non-metropolitan local officials consultation process	23 CFR 450.210(b) (1)	R for C	5 years following SAFETEA-LU	STP
9	Urban area boundaries	23 CFR 470.105(a)	R & A	As needed or as revised by State	STP
10	Interstate additions & revisions	23 CFR 470.111, 115(a)	R & Recommend action to HQ	As requested by State	STP
11	NHS revisions	23 CFR 470.113, 115(a)	R & Recommend action to HQ	As requested by State	STP
12	Public Lands discretionary funds application	FHWA Federal Lands Access	R & Recommend action to HQ	Periodic (usually annually, date varies)	STP
13	Safe Routes to School Program	SAFETEA-LU 1404	R C & A	Annually	DTD
<b>Metropolitan Planning</b>					
1	Unified Planning Work Program for TMAs	23 CFR 450.314(a)	R & A	Annually	MTP
2	Transportation plan for non-attainment metropolitan areas	23 CFR 450.322	R & A	Every 4 yrs	MTP
3	Transportation plan for attainment metropolitan areas	23 CFR 450.322	R for C	Every 5 yrs	MTP
4	TIP and corollary STIP amendments for non-attainment areas	23 CFR 450.324 - 330(b)	R & A	As requested by State - at least biennially	MTP
5	TIP and corollary STIP amendments for attainment areas	23 CFR 450.324 - 330(a)	R & A	As requested by State - at least biennially	MTP
6	FHWA/FTA TMA planning certification	23 CFR 450.334	Conduct w/FTA	Every 4 yrs	MTP
7	Metro planning area boundary changes	23 CFR 450.308	R for C	As needed/revised by MPO/State	MTP
8	MPO/State certification of MPO planning process	23 CFR 450.334	R for C	In conjunction with TIP approval (at least biennially)	MTP
9	State PL funds formula	23 CFR 420.109(a)	R & A	As needed or as revised by State	MTP
<b>Highway Information</b>					
1	HPMS data submission	FHWA HPMS Field Manual	R for C (State sends direct to HQ w/copy to Div.)	Annually by June 15	STP
2	HPMS data review	FHWA HPMS Field Manual	Participate	Annually by Dec. 15	STP
3	Highway statistics reports (various)	FHWA Guide to Reporting Highway Statistics	R for C (State sends direct to HQ w/copy to Div.)	Quarterly is scheduled first weeks Oct., Jan., April., and then July 15 for final quarter/year-end (annual) publication	STP
4	Public road mileage certification	23 CFR 460.3 & 23 CFR 460	Initiated by HPMS for HQ signature	Annually by June 1	STP
5	Traffic Monitoring System	23 CFR 500.203	R for C	As needed or revised by State	STP
6	Functional classification of highways/streets	23 CFR 450.105(b)	R & A	As needed or as revised by State	STP
<b>Air Quality</b>					
1	Transportation plan conformity determination for non-attainment areas	40 CFR 93.104(b)(3)	R & A	Every 4 years	MTP
2	TIP conformity determination for non-attainment	40 CFR 93.104(c)(3)	R & A	Every 4 years or as needed	MTP
3	CMAQ funds report	10/2008 CMAQ guidance memo	R for C and send to HQ	Annually	MTP
4	CMAQ funds eligibility determination	10/2008 CMAQ guidance memo	R & A	As requested by State	MTP

#	Activity	Authority	Action	Frequency	Delegated To
5	MPO/state air quality agency agreements	23 CFR 450.314(c)	R for C	As needed or revised by MPO/State	MTP
R = Review, A = Approve, C = Compliance					
STP – FHWA Statewide Transportation Planner, MTP – FHWA Metropolitan Transportation Planner, SE – FHWA Structural Engineer					

## 3.12. RESEARCH

### 3.12.1. Introduction

The Research program includes activities related to transportation technology.

### 3.12.2. Method of Operation

The role of FHWA is to conduct research of national focus and to transfer those technologies to state and local transportation agencies. The role of CDOT’s Research Branch is to conduct research specific to state transportation needs and problems and to transfer technologies developed elsewhere into practice in Colorado. One important role is the evaluation of experimental features on construction projects where new products and methods used elsewhere have not yet been adopted as standards in Colorado.

### 3.12.3. CDOT Organization

The Research, Development, and Technology Transfer program (RD&T) at CDOT is the responsibility of the Research Branch of the Division of Transportation Development. The Structures and Technology Applications Team will handle the Federal-aid operations of research and technology transfer activities.

The primary products are:

1. Applied research: The study of phenomena relating to a specific known need in connection with the functional characteristics of a system to answer a question or solve a problem;
2. Development: The translation of basic or applied research results into prototype materials, devices, techniques, or procedures for the practical solution of a specific problem in transportation; and
3. Technology Transfer: Dissemination, demonstration, training, and other activities that lead to the eventual deployment of a new technique or product.

### 3.12.4. FHWA Organization

The FHWA Research Program Manager is the primary liaison for research related activities with CDOT. The Manager will review final highway engineering related research reports produced by or for CDOT to ensure Federal-aid funds are appropriately used. In addition, the Manager will serve on the CDOT Research Implementation Committee that is responsible for guiding and directing the research and development program. The Manager provides engineering expertise, leadership, and oversight of the Local Technical Assistance Program. Also, the Manager serves as the principal

advisor to CDOT on federal requirements for a variety of significant national studies on transportation needs.

### 3.12.5. Quality

The purpose of RD&T at CDOT is to save Colorado money, time, and lives, and to improve the quality of life and the environment through the development and deployment of new or innovative methods, products, or materials in the planning, design, construction, and operation of transportation. The ultimate measure of quality is how effectively this is accomplished. To meet this purpose, research must be timely, relevant and valid when applied to priority real-world problems. It must also be cost-effective, and accurately documented and disseminated. The technology must be appropriately transferred to the practitioner so as to be effectively utilized.

Quality is controlled in RD&T through oversight and review by experts and stakeholders. Oversight teams and the Research Council are used to help focus the research program into priority areas with urgent problems to be solved. Research study panels composed of subject matter experts and practitioners with an interest in utilizing the research results are used in conjunction with each research study. A peer review of CDOT's research management process will be conducted every three years by researchers from other state DOTs after being trained in techniques for performing a peer review.

FHWA and CDOT will also develop risk response strategies of CDOT's research process when necessary.

This process is documented in the *Colorado Department of Transportation Research, Development, and Technology Transfer Procedures Manual* (June 28, 1995).

The following performance indicators will be used to assess the health of the Research Program:

**Table 30 - Performance/Compliance Indicators (Research)**

<b>SAP #</b>	<b>Indicator</b>	<b>Description</b>	<b>Reporting Mechanism</b>	<b>Target/Baseline</b>	<b>Reporting Frequency</b>
415	<b>Percent of annual SPR funds spent</b>	Percent of annual fund spent on RD&T (professional services) activities	Research Work Plan and Report	Minimum 50%/Track Trend	State FY

### 3.12.6. Performance/Compliance Measures

The following performance measures will be used to assess the health of the Research Program:

**Table 31 - Performance/Compliance Measures (Research)**

SAP #	Measure	Description	Reporting Mechanism	Target/Baseline	Reporting Frequency
97	Percent of recommendations implemented	<p>Percent of recommendations implemented or adopted within two years of final research report, using 5 years of data</p> <p>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, impact maintenance practice, update manuals, initiate new programs, and provide new technology</p>	Research Work Plan and Report	50%	State FY
413	Number of projects completed on schedule	The number of projects completed in the fiscal year on schedule	Research Work Plan and Report	10	State FY
416	The annual number of classes scheduled by the LTAP Center	The number of classes scheduled by the LTAP Center	Annual Report	70	State FY
417	The annual number of people trained by the LTAP Center	The number of people who attended classes offered by the LTAP Center	Annual Report	1400	State FY
473	The annual number of people attending training on the Front Range and Eastern Plains	The number of people attending training from the Front Range and Eastern Plains	Annual Report	1000	State FY
474	The annual number of people attending training on the Western Slope	The number of people attending training from the Western Slope	Annual Report	400	State FY
475	The annual number of agencies attending training offered by the LTAP Center	The number of agencies attending training offered by the LTAP Center	Annual Report	100	State FY

**Table 32 - FHWA Required Action List (Research)**

Research					
#	Activity	Authority	Action	Frequency	Delegated To
1	SPR work program	23 CFR 420.111	R & A	Annually by June 30	FHWA Research Program Manager



2	Experimental Project work plans	<a href="#">FHWA LTAP Field Manual</a>	R & A	Project by project on June 1	FHWA Research Program Manager
3	LTAP centers work plan and budget	<a href="#">FHWA LTAP Field Manual</a>	R & A	Annually by May 1	FHWA Research Program Manager
4	RD&T work program	<a href="#">23 CFR 420.209</a>	R & A	Annually by June 30	FHWA Research Program Manager
R = Review, A = Approve, C = Compliance					

### 3.13. **CIVIL RIGHTS**

#### 3.13.1. Introduction

The Civil Rights program is responsible for all activities relating to civil rights in CDOT and at the national level.

#### 3.13.2. Method of Operation

The Civil Rights programs are non-exempt under MAP -21; therefore, FHWA oversight continues. The Civil Rights Stewardship Agreement is a Quality Control and Quality Assurance (QA & QC) 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 the Civil Rights & Business Resource Center (CRBRC) to monitor on a program level basis. Staff from CDOT’s CRBRC), 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.

Civil rights programs are an integral part of all aspects of CDOT’s on-going activities. The partnership between CDOT and FHWA continues to be an important part of ensuring compliance with the letter and spirit of laws and regulations.

#### 3.13.3. CDOT Organization

Reporting directly to the Division Director of Administrative Services (DAS), the Civil Rights & Business Resource Center (CRBRC) provides direct services as well as program oversight. Program activities include:

- Title VI Program Implementation & Assessment;
- Americans with Disabilities Act (ADA) Title II Program Implementation & Assessment;
- Disadvantaged Business Enterprise (DBE) Program;
- DBE Supportive Services;
- Emerging Small Business (ESB) Program (Race Neutral);
- Contractor Compliance (External EEO);
- On-the-Job Training (OJT) Program; and
- OJT Supportive Services.

The following “internal” Civil Rights program activities have been moved directly under the Human Resource Branch:

- Internal EEO compliance, training, and investigation;

- ADA Title I compliance, training, and investigation;
- Sexual Harassment prevention and investigation (Title VII), and
- Diversity.

The primary products of CDOT's CRBRC, Human Resources and Regional Civil Rights Offices are:

- Assurance that CDOT, its recipients and contractors are in compliance with all Civil Rights laws, regulations and directives;
- Instruction, advice, technical assistance, and statistical/program monitoring in support of CDOT's Civil Rights Programs;
- Investigation of complaints of discrimination under Title VI, Title VII and ADA;
- Implementation of all external programs in the Regions;
- Training in all areas of Title VI, DBE, OJT, EO Contractor Compliance and ADA;
- Contract and compliance programs; and
- Compliance with DBE program in CDOT Regions.

#### **3.13.4. FHWA Organization**

The FHWA Colorado Division Office has the lead role in partnering with CDOT on all Civil Rights Program matters. The Civil Rights Specialist is the principle contact under this Stewardship Agreement. Division Office staff will coordinate all Civil Rights matters within their respective CDOT Regions or sections with the Civil Rights Specialist. The Civil Rights Specialist will immediately advise CDOT's CRBRC to ensure appropriate oversight and statewide reporting is maintained.

The primary products of the FHWA Division Office include technical assistance, regulatory guidance and coordination of training from the Division Office, the Resource Center and FHWA Headquarters.

#### **3.13.5. Quality**

CRBRC is responsible for overall quality control in CDOT's Civil Rights Programs. Departmental Program Indicators have been established and are monitored by this office. The CRBRC's DBE Program staff is responsible for reviewing DBE project goal commitments and, in cooperation with the Region, conducts Good Faith Efforts analyses and determinations prior to award. The CRBRC's Program staff is responsible for implementing and monitoring CDOT's OJT Program, and works in cooperation with the Regional Civil Rights Offices to assist in regional complaints. Additionally, the CRBRC has full responsibility for Title VI Implementation & Assurance. Finally, the CRBRC's ADA Program staff is responsible for overall management and oversight of compliance with the ADA.

Regional Civil Rights Managers are responsible for quality control in Civil Rights programs at the project and regional level. Regional Civil Rights Managers set project specific DBE and OJT goals, conduct regional contract compliance reviews, ensure regional compliance with Civil Rights laws and regulations, investigate discrimination complaints in the region, and cooperate with the CRBRC to develop appropriate training and outreach activities. The CRBRC is also responsible for quality control in external EO Contract Compliance.

Quality control is documented by various detail and summary reports made to FHWA and the Transportation Commission. Additionally, the CRBRC Director conducts as needed Civil Rights Program Quality Assurance Reviews of each Regional Civil Rights Office to ensure that CDOT's civil rights programs are being appropriately implemented.

A Quality Assurance program is cooperatively conducted by FHWA and the CRBRC, with assistance from Staff Services and the Regions. This team submits reports and makes recommendations for improving the program to the QIC. The frequency of these reviews is negotiated and agreed on by FHWA, the CRBRC, and the QIC.

The CDOT Civil Rights program is documented as follows:

- DBE processes – DBE Program Plan and CDOT Policy and Procedural Directives;
- Contractor Compliance (External EEO) Manual
  - OJT processes –OJT Special Provisions;
- ADA processes – ADA Transition Plan and CDOT Policy and Procedural Directives;
- Title VI processes – CDOT Policy and Procedural Directives and CDOT’s Title VI Program Plan (includes Limited English Proficiency);
- ESB processes – ESB Rules, ESB Program Guidelines and ESB Special Provision;
- Internal Civil Rights processes – CDOT Policy and Procedural Directives; CDOT’s Affirmative Action Plan and Update and Complaint Investigation Manual

### 3.13.6. Performance/Compliance Measures

The following performance measures will be used to assess the health of the Civil Rights Program:

**Table 33 - Performance Measures (Civil Rights)**

<b>SAP #</b>	<b>Measure</b>	<b>Description</b>	<b>Reporting Mechanism</b>	<b>Target/ Baseline</b>	<b>Reporting Frequency</b>
107	<b>DBE participation (as percentage) to date on Federal Aid Highway Program.</b>	DBE Program	Transport	10.25%	Federal FY <b>Semiannual Reporting</b>
459	<b># of DBE firms receiving supportive services/benefits</b>	DBE Supportive Services (DBE/SS)	Connect2DOT Program	30	Federal FY
313	<b># of completed Contract Compliance Reviews</b>	Contractor Compliance (External EEO) Program	SharePoint	18	Federal FY
460	<b># of OJT hours achieved</b>	On the Job Training (OJT) Program	Access DB	7,000 hours	Federal FY
461	<b># of persons placed and employed (post-services)</b>	OJT Supportive Services (OJT/SS)	AIMS CC IGA	40	Federal FY
310	<b># of completed STA reviews</b>	Title VI Program	Title VI Assessment	6	Federal FY
462	<b># of completed subrecipient reviews</b>	ADA Title II Program	ADA Transition Plan	5	Federal FY

**Table 34 - FHWA Required Action List (Civil Rights)**

Civil Rights					
#	Activity	Authority	Action	Frequency	Delegated To
1	Title VI Plan accomplishments and next year's goals	<a href="#">23 CFR 200.9(b)(10)</a>	R & A	Annually by Oct. 1	CRS
2	Title VI Plan update	<a href="#">23 CFR 200.9</a>	R & A	As needed or requested by State	CRS
3	State internal EEO affirmative action plan (Title VII) accomplishments and goals	<a href="#">23 CFR 230.311</a>	R & A	Annually by Dec. 1	CRS
4	State internal EEO (Title VII) plan update	<a href="#">23 CFR 230.311</a>	R & A	Annually by Dec. 1	CRS
5	EEO Contract Compliance review reports	<a href="#">23 CFR 230.409, 230.413(b)(1)(i)(D)</a>	R & A	As submitted by State	CRS
6	State Employment Practices Report (EEO-4)	<a href="#">23 CFR 230.311(a)(2)</a>	R for C and send to HQ	Biennially (Aug 15th every odd year) per HQ memo dated 6-9-11	CRS
7	Uniform Report of DBE Awards or Commitments and Payments	<a href="#">49 CFR 26, Appendix B and Subpart C</a>	R for C and send to HQ	Semi-annually by June 1 and Dec. 1	CRS
8	Disadvantaged Business Enterprise (DBE) Program revisions	<a href="#">49 CFR 26.21(b)(2)</a>	R & A	As needed or as requested by State	CRS
9	State's DBE program goals	<a href="#">49 CFR 26.41</a> <a href="#">49 CFR 26.45(f)(1)</a>	R & A	Due by Aug 1 every three years	CRS
10	Supportive services funds requests (OJT and DBE)	<a href="#">23 CFR 230.113, 230.204</a>	R & A	As requested by FHWA	CRS
11	Annual Contractor Employment Report (Construction Summary of Employment Data (form PR-1392)	<a href="#">23 CFR 230.121(a)(3)</a>	R for C and send to HQ	Annually by Sept 25	CRS
12	Report on supportive services (On-the-Job Training (OJT) & DBE)	<a href="#">23 CFR 230.121(e)</a>	R for C and send to HQ	Annually by Dec. 1	CRS
13	OJT goals & accomplishments	<a href="#">23 CFR 230.111(b)</a>	R for C	Annually by Jan 30	CRS
14	Historically Black College & University (HBCU) Report	<a href="#">Pres. Exec. Order 12876, dated Nov. 1, 1993</a>	Prepare report & submit to HQ	Annually by Nov 15	CRS
15	Americans with Disabilities Act Review complaint	<a href="#">28 CFR 35.190</a>	Conduct evaluation & correct or recommend action to HQ	As requested by HQ	CRS
16	CDOT's ADA Transition Plan	<a href="#">28 CFR 35.150</a>	Conduct evaluation & correct or recommend action	Annually by Aug 1	CRS

R = Review, A = Approve, C = Compliance  
CRS – FHWA Civil Rights Specialist

### 3.14. **CONTRACTING, ENGINEERING ESTIMATES AND OTHER PROJECT SUPPORT**

#### 3.14.1. Introduction

The Contracts and Market Analysis (CMA) Branch is responsible for preparing contracts for construction projects and professional consulting services, engineering cost estimates for projects prior to bidding, bid collusion detection, materially unbalanced bid detection and AASHTOWare Project software support. The Branch Units responsible for supporting the aforementioned tasks include Engineering Contracts, Engineering Estimates and Market Analysis (EEMA) and AASHTOWare Project Support\*.

#### 3.14.2. Method of Operation

The Engineering Contracts Unit contracts for construction and professional services in accordance with applicable Federal rules and regulations. The EEMA Unit prepares project engineering cost estimates, as required by federal regulations, and monitors bidding activity for materially unbalanced bids and collusion. The AASHTOWare Project Support Unit\* provides technical support on the AASHTOWare Project suite of software to statewide users.

*\*Note: The Programs and Project Analysis Unit has been renamed the AASHTOWare Project Support Unit, effective September 1, 2013. Labor and contract compliance has been moved to the Center for EEO. The AASHTOWare Project Support Unit will exclusively support modules of the AASHTOWare software suite (formerly known as Trns\*Port).*

#### 3.14.3. CDOT Organization

##### 1. Engineering Contracts

The Engineering Contracts Unit provides two different types of services – construction contracting and professional services contracts. The construction contracting unit conducts the contracting process for construction projects including contractor prequalification, advertisement for bids, opening of paper and electronic bids, award and execution of the contract, and issuance of the notice to proceed once signed by the Chief Engineer. The Engineering Contracts Unit conducts the contracting process for professional services (engineers, architects, surveyors and industrial hygienists), including consultant prequalification, issuance of the Request for Proposals (RFP), facilitation of the selection process, contract negotiations, and execution of the contract;.

##### 2. Engineering Estimates and Market Analysis (EEMA)

The EEMA Unit prepares engineering cost estimates of construction projects prior to bidding, serves as an independent cost estimator (ICE) on CM/GC projects, performs materially unbalanced bid analysis and bid collusion analysis on submitted bids and prepares cost estimates for added work on active construction projects.

##### 3. AASHTOWare Project Support

The AASHTOWare Project Support Unit is responsible for user support for the AASHTOWare Project software used for pre-construction and construction project management, including training, technical assistance, and reporting.

### 3.14.4. FHWA Organization

The Program Delivery Teams in the FHWA Colorado Division are responsible for contract administration, contract changes, dispute resolution and claims. The teams consist of a Program Delivery Team Leader who has leadership responsibility for the team, Operations Engineers, and other Program Managers. Operations Engineers within each of the FHWA Program Delivery Teams are assigned to and serve as liaisons for each of the CDOT Regions

### 3.14.5. Quality

The following elements are included:

- Tracking of Professional Services selections and contracts executed;
- Tracking of Professional Service Contract average routing times;
- Tracking of Construction contracts awarded;
- Tracking of Construction Contract Advertisements deferred by revisions;
- Tracking of Construction bids versus Engineer's Estimates and contracts awarded;
- Reviewing contract documents to ensure proper form;
- Submitting Quarterly selection report to FHWA Program Delivery Team Leader per CFR 172.9(b);
- Oversight of CDOT process to request FHWA approval of consultant PM prior to contract per CFR 172.9(d); and
- Tracking of training courses offered and employees trained.

### 3.14.6. Performance/Compliance Measures

The following performance measures will be used to assess the health of the Contracts and Market Analysis Branch Programs:

**Table 35 - Performance/Compliance Measures (Contracts and Market Analysis)**

SAP #	Measure	Description	Reporting Mechanism	Target/Baseline	Reporting Frequency
239	Percent of projects awarded without a justification letter and CE approval	Percent of awarded low bids within +15% to -20% of Engineer's Estimate on projects over \$250,000	CDOT Branch Work Plan, Chief Engineer Objectives	85%	State FY
463	Percent of projects awarded within set percentage of Engineer's Estimate	Percent of awarded low bids within +/- 10% of Engineer's Estimate on ALL projects	CMA Branch Work Plans	55%	State FY <b>Quarterly reporting</b>
241	Percent of projects awarded within set timeline of bid opening (CDOT oversight and FHWA oversight)	Percent of projects awarded within 30 days of bid opening	CMA Branch Work Plans, Chief Engineer Objectives	95%	State FY
246	Percent of professional services contracts executed within set timeline	Percent of professional services contracts executed* within 17 weeks * Executed defined by date of Advertisement to date of Controller Signature	CMA Branch Work Plans, Chief Engineer Objectives	85%	State FY

**Table 36 - FHWA Required Action List (Contracts and Marketing)**

#	Activity	Authority	Action	Frequency	Delegated To	
					CDOT	FHWA
<b>Contracts and Market Analysis</b>						
FHWA assumes responsibility for the following on FHWA oversight projects and CDOT assumes responsibility on all other projects.						
1	Competitive Bidding Exceptions	23 CFR 635.104, 23 USC 112	R & A	As requested	DA	DA
2	Concurrence in Award	23 CFR 635.114, 23 USC 112(d)	R & A	Project by project	AO, RE	OE
3	Authorization to Advertise (all projects)	23 CFR 635.309	R & A	Project by project	OE	OE
4	Addenda or Revisions under advertisement	23CFR 635.112(c)	R & A	Project by project	RE	OE
5	Rejections of low bidder	23CFR 635.114(f)+(g)	R & A	Project by project	EE, RE	OE
6	Rejections of all bidders	23CFR 635.114(h)	R & A	Project by project	RE	OE
<b>Non-Project Specific Activities</b>						
7	Contracting Procedures Consultant Selection	23 CFR 172.5	R & A	As updated	PDTL	PDTL
8	Consultant Services and Management Roles	23 CFR 172.9 (d)	R & A	Project by project	RE	OE
9	Bid Opening/Tabulations	23 CFR 635.113	Periodically R for C (State takes action)	Per letting	EE	EE
R = Review, A = Approve, C = Compliance, OE - FHWA Operations Engineers, RE - CDOT Resident Engineer, DA - FHWA Division Administrator, PDTL – FHWA Program Delivery Team Leaders, EE – CDOT Engineering Estimator, AO –CDOT Awards Officer						

### 3.15. ASSET MANAGEMENT

#### 3.15.1. Introduction

Asset management is a strategic and systematic process of operating, maintaining and improving physical assets, with a focus on engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost. (23 U.S.C. 101(a)(2), MAP-21 § 1103). CDOT invests in assets such as pavement, bridges, roadway equipment and Intelligent Transportation Systems, as well as the maintenance of each of these assets.

The Department’s Transportation Performance Branch (TPB) coordinates with the program managers of these assets, the Regions, the Information Management Branch, and others in the Department to comprehensively manage these assets. TPB’s mission is to empower the

Department's strategic planning and decision-making by providing tools that effectively measure, analyze, forecast and communicate to staff and transportation stakeholders the performance of CDOT programs and investment decisions.

### 3.15.2. Method of Operation

The Transportation Performance Branch facilitates performance measures and asset management dialogue within CDOT and with external stakeholders. This role has become more important with the Moving Ahead for Progress in the 21<sup>st</sup> Century legislation (MAP-21), which was signed into law in July 2012 and took effect in October 2012. MAP-21 requires state departments of transportation nationwide to develop risk-based transportation asset management plans and to establish statewide performance targets. TPB is working with CDOT engineering and finance staff, along with Transportation Commissioners, to fulfill the new federal requirements. The result of this effort will be a Risk-Based Asset Management Plan (RB AMP).

### 3.15.3. CDOT Organization

#### 1. Transportation Commission

The Colorado Transportation Commission directs CDOT in the management of the state transportation system. The Commission is composed of 11 Commissioners who represent specific districts in the state and are appointed by the Governor to four-year terms. State law empowers the commission to formulate general transportation policy and to advise and make recommendations to the Governor and the General Assembly on issues related to transportation policy and CDOT's budgets and programs.

#### 2. DTD

CDOT's Division of Transportation Development includes five branches: Multimodal Planning, Information Management, Environmental Programs, Applied Research and Innovations, and Transportation Performance. The Planning and Performance Branches work closely together to identify and meet federal requirements. As CDOT gains more understanding in the areas of life-cycle asset management, the Transportation Performance Branch will provide objective analyses of the costs and benefits of investing in each asset.

#### 3. Staff Branches

CDOT's asset areas (including pavement, bridge, maintenance, Intelligent Transportation Systems and roadway equipment) fall under the Department's Division of Staff Branches. Asset managers provide expertise on the inventory, condition, and expected life cycle for their areas. TPB works with the asset managers to understand the current and forecasted condition of assets based on various levels of funding, using a budget scenario trade-off tool developed for this purpose.

#### 4. OFMB

CDOT's Office of Financial Management and Budget (OFMB) within CDOT's Division of Finance and Accounting works with the Governor's Office of State Planning and Budget to determine CDOT's annual budget as well as short- and long-term revenue forecasts. TPB works with OFMB to identify the overall budget available to the asset areas and determine which inflation and revenue assumptions should guide discussion across all assets.



### 3.15.4. FHWA Organization

The oversight of Asset Management activities at CDOT requires the development of a process to create a risk-based transportation asset management plan, and this process must be certified by FHWA.

### 3.15.5. Quality

The RB AMP will include:

- Inventory and condition of pavement and bridges on the National Highway System
- Asset management objectives and measures
- Performance gap identification
- Life-cycle cost and risk management analysis
- A financial plan
- Investment strategies

### 3.15.6. Performance/Compliance Measures

CDOT is developing a risk-based asset management program to meet MAP-21 requirements. The Department is producing no performance measures for MAP-21 other than the Risk-Based Asset Management Plan, which will be scheduled to be finalized and presented to the Transportation Commission in January 2014, and will be delivered to FHWA in February 2014 ahead of the MAP-21 deadline of October 2015 imposed by FHWA.

**Table 37 - FHWA Required Action List (Asset Management)**

<b>Transportation Performance Branch</b>						
#	Activity	Authority	Action	Frequency	Delegated To	
					CDOT	FHWA
1	TAM Plan	23 U.S.C. 119(e)(1)(4)(5)(8), MAP-21 § 1106	Certify	Every 4 years	DTD	DA
2	Pavement Performance Data	23 U.S.C. 150(d)	R	Every 2 years		
3	Bridge Performance Data	23 U.S.C. 150(d)	R	Every 2 years		

R = Review, A = Approve, C = Compliance,  
OE - FHWA Operations Engineers, RE - CDOT Resident Engineer, DA - FHWA Division Administrator,  
PDTL – FHWA Program Delivery Team Leaders, EE – CDOT Engineering Estimator, AO –CDOT Awards Officer

*End Section – 3*

## **SECTION 4. STEWARDSHIP AND OVERSIGHT AGREEMENT AMENDMENT FOR FASTER BRIDGE**

### **4.1. INTRODUCTION**

Although CDOT's FASTER Bridge Program is State funded, using Federal-Aid dollars to repay the Bond Proceeds federalizes the Program and thus triggers the need to document how oversight will be handled by the Colorado Division. Oversight will be handled similar to the process used for ARRA projects in that a combination of existing procedures, as well as practices and increased actions to address identified risks, will be used. At a minimum, all actions normally taken to authorize federal-aid construction projects, as described in the CDOT/FHWA Stewardship Agreement, will be followed.

FASTER Bridge projects will be either FHWA Oversight, or State delegated Oversight. The Colorado Division has oversight responsibilities as outlined in the Stewardship and Oversight Agreement with the CDOT. This Oversight Plan will be included as an addendum to the Stewardship Agreement.

### **4.2. PROGRAM OVERSIGHT**

Overall FASTER Bridge program oversight will be provided by the Division Bridge Engineer (Program Manager) with assistance from his Program Delivery Team Leader under the guidance of the Assistant Division Administrator and the Division Administrator. This Program Manager will be the primary point of contact for the Division with regard to program level interaction with the Bridge Enterprise. This manager will monitor FHWA and State oversight to assure compliance with the project level guidance provided herein. This manager will organize and coordinate reviews and actions to address the risks identified for the program, including Risk Management Reviews supported by project level Program Accountability Reviews (PARs). As projects are awarded for construction, the project owner, CDOT or a local agency will provide details to the FASTER Bridge Program Manager.

### **4.3. PROJECT OVERSIGHT**

Oversight is a function undertaken by FHWA, CDOT and/or a Local Agency to assess the health of, minimize risk to, and ensure the Federal-Aid Highway Program is delivered in accordance with applicable laws, regulations, policies, and consistent with good business practices. The level of Oversight will be identified on a project by project basis as determined by the potential for risk as identified in each Risk and Opportunity Area defined in Section 5.3.4. This will occur at the earliest point possible in the project development process and will be accomplished by the Division Bridge Engineer, Division Operations Engineers and other Division Program Managers. Program Accountability & Results Reviews (PARs) will be used to assess the various risks and issues and identify new concerns on the FASTER Bridge projects. The level of Oversight will be adjusted as risks are mitigated and or new risks or concerns are identified.

#### **4.3.1. FHWA Oversight**

FHWA retains authority for the following actions on FHWA oversight projects:

- Review and Approve Preliminary layout, Type Selection report
- Plan, Specifications & Estimates (PSE) Approval;

- Approval of Design Exceptions;
- Contract Concurrence in Award;
- Contract Change Order (CO) Approval
- Approval of Contract Claims Settlement;
- Final Inspection;
- Project Acceptance.

Additionally, for FASTER Bridge projects at this level, Division personnel will make:

- General construction reviews at least every three months;
- Inspections of construction of major structures;
- Final inspection with CDOT at the end of construction;
- Project Accountability Reviews (PARs) in support of Risk Management Reviews.

#### 4.3.2. State Oversight

*State-administered projects* - These projects, for which much of the oversight is delegated to CDOT will be monitored in the manner prescribed in the Stewardship Agreement and through PARs. In general, FHWA personnel will assure eligibility, compliance with NEPA and Planning regulations, and obligate funds, but will be limited in other approvals and inspections, in accordance with their delegation of authority. FASTER Bridge oversight will be provided by sampling this group of projects for the Risk Management Reviews as described below. CDOT will send the FHWA Program manager a courtesy copy of the Structure Selection Report on State delegated D/B/B projects.

*Local Agency administered projects* – CDOT does not anticipate any FASTER Bridge projects being delivered by a Local Agency. If any FASTER Bridge projects do become Local Agency administered, CDOT and FHWA will determine the level of oversight on a project by project basis.

#### 4.3.3. Exceptions

The following actions require the approval of FHWA regardless of project funding:

- Addition of access points on the Interstate System;
- Changes in the access control of the Interstate;
- Use of Interstate airspace for non-highway-related purposes;
- Disposal of Interstate Right of Way;
- Design exceptions affecting Interstate highways (13 controlling criteria);
- Changes in Interstate Land Use or Operations.

The following actions require the approval of FHWA for Federal-Aid Projects, regardless of oversight:

- Obligation of funds;
- Waivers to Buy America requirements (FHWA Washington Headquarters (HQ) approval required as noted in Mr. Horne's July 3, 2003 memorandum);
- SEP-14/SEP-15 methods (FHWA HQ approval required for experimental contracting/project delivery methods);
- Civil Rights program approvals;
- Environmental approvals except those specifically delegated under Sections 6004 and 6005 of SAFETEA-LU;
- Hardship acquisition and protective buying;
- Modifications to project agreements;
- Final vouchers;

- Project Limit Extensions.

#### **4.3.4. Risk Management Reviews: Addressing Identified Risks**

The Division has identified a list of risks associated with implementation of FASTER Bridge projects along with areas of Opportunity. These risks and opportunities are identified below. This listing is based on an internal risk analysis. In addition to the project inspections outlined above, the Division will use Risk Management Reviews to investigate the risks identified through project contacts and sampling of FASTER Bridge projects. Each project contact will be documented as a Program Accountability Review (PAR).

The FASTER Bridge Program Manager will periodically select a risk topic, prepare field inspection guidance and coordinate project contacts by the Operations Engineers and other Division personnel to provide a “look” at projects for that topic. The FASTER Bridge Program Manager will then accumulate the PAR findings and review the statewide results, to determine whether the topic is considered low or high risk due to statewide findings. For topics with low risk, the review will be documented and closed. For topics where issues are found across the reviewed projects, additional investigation or review will be considered and possibly undertaken by the Division.

#### ***Risk and Opportunity Areas***

This plan identifies the primary risks and response strategies of how FHWA will manage the risks associated with delivering the FASTER Bridge program in Colorado. The Division’s primary risks are; inadequate construction staffing; potential for inflated construction costs; and possible fraudulent contract or construction practices. Opportunity areas include; increased use of innovative procurement or construction methods and; the ability to enhance DBE participation.

Federal oversight will include regular meetings/communications with state HQ personnel, especially early in the life of the program and regular meetings with state Regional personnel throughout the life of the program.

#### **Risk 1: Ability of CDOT to adequately staff construction projects, Concern with both number of personnel and qualifications**

The Division will monitor award and notice to proceed dates to insure that projects are under construction in a reasonable time after award. CDOT and local agencies will be requested to provide staffing information to the Division. Division personnel will evaluate the adequacy of the staffing reported. During field inspections, project records will be checked to see that they are reasonably up to date and complete.

#### **Risk 2: High demand for Bridge construction work may inflate contract costs beyond reason or some material may be unavailable**

The Division will work with CDOT to track Award costs on contracts and for critical items such as concrete, asphalt, aggregate and steel. CDOT will be encouraged to develop contingency plans in case some materials such as concrete and or steel may become limited in supply. If prices appear to be inflated beyond reason, or materials are unavailable, the Division will discuss with CDOT a request for extension on time or modify the plans to substitute a different material if possible.

#### **Risk 3: With the large influx of projects, fraud, waste and abuse in contracting, bidding or construction may be experienced**

The Division and CDOT will monitor projects specifically looking for instances of fraud, waste, or abuse.

**Opportunity 1: Increased use of innovative procurement or construction methods;**

The Division will work with CDOT to identify and pursue innovative procurement and construction methods consistent with the Every Day Counts initiative. Those projects delivered by an innovative procurement method such as Design/Build or CM/GC and or those projects that utilize innovative construction methods such as Prefabricated bridge elements and systems or Geosynthetic Reinforced Soil could trigger a higher level of Oversight by FHWA to ensure CDOT has necessary support for these projects.

**Opportunity 2: Enhance DBE Participation to meet DBE goals**

The Division will work with CDOT on setting and attaining DBE goals and fully support enabling CDOT to achieve any Aspirational Goals set for this Program.

**4.3.5. Financial Management Controls and Oversight**

All of the current Division processes and controls on project financial oversight will apply to FASTER Bridge projects. In addition, extra processes and procedures will be implemented as detailed below.

FHWA will focus billing reviews in June, July and August 2011 on FASTER Bridge projects, selecting five to ten for review. All FASTER Bridge projects, regardless of oversight level, will have an equal chance of being selected. This billing review will focus on eligible and allowable costs. The checklist FHWA has developed for the Improper Payment Information Act (IPIA) will be used and some of the review will be conducted by the FHWA Operations Engineers or Program Manager.

One area of concern that will be monitored as an extension of the current inactive reports is the expenditure of funds on each of the FASTER Bridge projects. This will ensure that projects are moving forward and the state and local agencies are billing in a timely manner. If a project appears to be inactive, it will be identified quickly and these concerns addressed.

The FHWA Finance Manager and Finance Specialist will work closely with CDOT Internal and External auditors. The state audit findings will be communicated to the FHWA FASTER Bridge Program Manager, DA, ADA and Team Leaders as an additional source of oversight information and indications of where risks lay.

*End Section – 4*

## SECTION 5. GLOSSARY

### 3R Projects - Resurfacing, Rehabilitation and Restoration

Control Document – Applicable standards, policies, and standard specifications that are acceptable to FHWA for application in the geometric and structural design of highways.

Core Functions – Activities that make up the main elements of the Division’s Federal-aid oversight responsibilities based on regulations and national policies. Core functions in the Division Office are Planning, Environment, Right-of-Way, Design, Construction, Finance, Operations, System Preservation, Safety, and Civil Rights.

Delegated Projects – Projects that do not require FHWA to review and approve actions pertaining to design, plans, specifications, estimates, right-of-way certification statements, contract awards, inspections, and final acceptance of Federal-aid projects on a project by project basis.

Emergency Relief Projects – The Emergency Relief (ER) program assists State and local governments with the expense of repairing serious damage to Federal-aid highways and roads on Federal Lands resulting from natural disasters or catastrophic failures. In addition to the permanent authorization of \$100 million annually, SAFETEA-LU authorizes such sums as may be necessary to be made available by appropriation from the General Fund to supplement the permanent authorization in years when Emergency Relief allocations exceed \$100 million. [1112]

Oversight Projects – Projects that require FHWA to review and approve actions pertaining to design, plans, specifications, estimates, right-of-way certification statements, contract awards, inspections, and final acceptance of Federal-aid projects on a project by project basis.

Major Projects – Projects with an estimated total cost greater than \$500 million, or projects approaching \$500 million with a high level of interest by the public, Congress, or the Administration.

Major Bridges - Major bridges are defined in the policy of FHWA Order 5520.1 "Preliminary Plan Review and Approval" and should have preliminary plan approval by FHWA. Examples of special features meeting major bridge project criteria are:

- Bridges with approximately (125,000 sq. ft.) deck area
- Bridge span of 152.4 meters (500 ft.) or greater
- Bridges utilizing high-strength steel or concrete or special materials
- Unusual bridge types, e.g., arches and trusses
- Tunnels and unusually high cuts or high fills
- Major hydraulic structures

Oversight – The act of ensuring that the Federal highway program is delivered consistent with laws, regulations and policies.

Performance/Compliance Indicators – These indicators track performance trends, health of the Federal-aid Highway Program, and compliance with Federal requirements.

Projects of Division Interest (PoDI) – Projects identified by the Division Office as having an elevated level of risk (threat or opportunity) and, therefore, warrant an increased level of Federal Oversight to ensure the successful project and/or Federal Highway Program delivery.

Risk Management – The systematic identification, assessment, planning, and management of threats and opportunities faced by FHWA projects and programs.

Stewardship – The efficient and effective management of the public funds that have been entrusted to the FHWA.

ISTEA, TEA-21, SAFETEA-LU, and MAP-21 – The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 was a six-year federal transportation funding law that took effect in 1991. ISTEA provided \$155 billion for highways, highway safety and transit for fiscal years 1992 through 1997. The Transportation Equity Act for the 21st Century (TEA-21) is a six-year extension of ISTEA providing a 40-percent increase in transportation funding for fiscal years 1998 through 2003. The Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users guaranteed (SAFETEA-LU) provided \$244.1 billion for highways, highway safety, and public transportation. SAFETEA-LU represents the largest surface transportation investment in our Nation's history. The Moving Ahead for Progress in the 21st Century (MAP-21) was signed in 2012. It creates a streamlined and performance-based surface transportation program. These acts have given states increased flexibility in establishing the degree to which FHWA will be involved in the development of the Federal-Aid Highway Program (FAHP).

## SECTION 6. APPENDIX A

### State Manuals (approved by FHWA for use on Federal aid projects)

MANUAL	Reference	RESPONSIBLE PARTY	FHWA Approval Y OR N
Roadway Design Guide – 2005	No Authority	Project Development Branch	Should review + concur
Right of Way Manual	23 CFR 710.201	Project Development Branch	Y
Utility Manual	CFR 625	Safety and Traffic Engineering Branch	Y
Access Code/Policy	No Authority	Safety and Traffic Engineering Branch	Should review + concur
Survey Manual	CFR 625	Project Development Branch	Y
Laboratory Manual of Test Procedures	CFR 625	Materials and Geotechnical Branch	Y
Field Materials Manual	CFR 625	Materials and Geotechnical Branch	Y
Local Agency Manual – 2006	No Authority	Project Development Branch	Should review + concur
Construction Manual – 2004	No Authority	Project Development Branch	Should review + concur
Project Development Manual	No Authority	Project Development Branch	Should review + concur
Manual on Uniform Traffic Control Devices (MUTCD) – State Adoption	23 CFR 655.603	Safety and Traffic Engineering Branch	Y
Colorado supplement to the MUTCD	23 CFR 655.603	Safety and Traffic Engineering Branch	Y
Standard Specifications for Road and Bridge Construction	23 CFR 625.3	Project Development Branch	Y
Standard Plans – M & S Standards	23 CFR 625.3	Project Development Branch	Y
Lighting Design Guide – 2006	CFR 625	Project Development Branch	Y
Consultant Selection Process	23 CFR 172.9	Project Development Branch	
CDOT Bridge Design Manual	CFR 625	Staff Bridge Branch	Should review + concur
CDOT Bridge Detailing Manual	CFR 625	Staff Bridge Branch	Should review + concur
CDOT Bridge Rating Manual	CFR 625	Staff Bridge Branch	Should review + concur
Colorado Structure Inventory Coding	CFR 650 Subpart C	Staff Bridge Branch	Y



FHWA Colorado Division and Colorado Department of Transportation  
Stewardship and Oversight Agreement

MANUAL	Reference	RESPONSIBLE PARTY	FHWA Approval Y OR N
Guide			
Overhead Signs, Signals, & High Mast Lights Coding Guide	No Authority	Staff Bridge Branch	N
Pontis Bridge Inspection Coding Guide	CFR 650 Subpart D	Staff Bridge Branch	Should review + concur
Bridge Asset Management & Inspection Manual (in progress)	CFR 650 Subpart C & D	Staff Bridge Branch	Should review + concur
Stakeholder Participation Guidance and Public Involvement Plan	23 CFR 771.111(h)(1)	Environmental Programs	Y
Disadvantaged Business Enterprise (DBE) Plan/DBE Goal	49 CFR 26	Center for Equal Opportunity	Y
Title VI Plan	23 CFR 230.311	Center for Equal Opportunity	Y
Affirmative Action Plan	23 CFR 230.311	Center for Equal Opportunity	Y
Drainage Design Manual	CFR 625	Project Development Branch	Y
Erosion Control and Stormwater Quality Guide	23 CFR 650.211	Environmental Programs	Y
Design – Build Manual - 2006	No Authority	Project Development Branch	Should review + concur
Pavement Design Manual	CFR 625	Materials and Geotechnical Branch	Y
ADA Transition Plan	28 CFR 35.151	Center For Equal Opportunity	N
OJT Program Plan	49 CFR 26	Center for Equal Opportunity	N
Noise Policy	23 CFR 772	Environmental Programs	Y