

**Final**  
STAFF SUMMARY OF MEETING

TRANSPORTATION LEGISLATION REVIEW COMMITTEE

Date: 07/16/2013

ATTENDANCE

Time: 09:03 AM to 03:52 PM

Place: HCR 0112

This Meeting was called to order by  
Representative Tyler

This Report was prepared by  
Kelli Kelty

Baumgardner	*
Buck	X
Coram	E
Everett	*
Fischer	E
Jones	X
King	*
Kraft-Tharp	X
Lawrence	X
Lee	X
Mitsch Bush	X
Moreno	E
Peniston	X
Primavera	E
Scott	X
Todd	E
Heath	X
Tyler	X

X = Present, E = Excused, A = Absent, \* = Present after roll call

Bills Addressed:	Action Taken:
Overview of Committee Materials	Witness Testimony and/or Committee Discussion Only
Briefing by the Aviation Industry	Witness Testimony and/or Committee Discussion Only
Report on the Waste Tire Program	Witness Testimony and/or Committee Discussion Only
Public Utilities Commission Report	Witness Testimony and/or Committee Discussion Only
Colorado Motor Carriers Association	Witness Testimony and/or Committee Discussion Only

**09:04 AM -- Overview of Committee Materials**

Representative Tyler, chair, called the meeting to order. He commented on the committee's upcoming northern Colorado tour. Senator Heath commented on the agenda for the committee during the interim. Ms. Kelli Kelty, Legislative Council Staff, gave an overview of the committee charge memo (Attachment A). She also commented on the upcoming northern Colorado tour. Mr. Jon Senft, Legislative Council Staff, gave a brief overview of a memorandum on state and local transportation funding (Attachment B).

**09:13 AM -- Briefing by the Aviation Industry**

Ms. Kim Day, representing the City and County of Denver, Mr. David Gordon, representing the Colorado Department of Transportation (CDOT), and Mr. Jason Licon, representing Fort Collins-Loveland Airport, introduced themselves to the committee. Ms. Day distributed a handout to the committee (Attachment C) and gave a brief overview of the Denver International Airport (DIA) and its services and amenities. Ms. Day commented on DIA's strong domestic network. She commented on new challenges faced by DIA, including facility maintenance, global competition, reaching design capacity, and changing revenue sources and airline economics.

**09:20 AM**

Representative Tyler asked for more information concerning substandard concrete on the runways and existing infrastructure. Ms. Day commented on the issue of settling soil and said that facilities are doing great. Representative Peniston asked if the tent concept of DIA is working effectively. Ms. Day said that the tent has been tested and is doing great. She said that within the next 10-15 years the roof will be replaced.

**09:22 AM**

Ms. Day commented on the Airport City Initiative, which will generate more than 30,000 jobs. Representative Peniston asked about intergovernmental agreements (IGAs) between Denver and Adams county. Representative Primavera asked for more information about the space port and DIA. Representative Buck asked about the physical size of DIA. Ms. Day said that DIA is about 34 million acres total.

**09:27 AM**

Discussion ensued concerning total acreage of DIA, its future plans for expansion, and the impact of the expansion on residences and businesses.

**09:34 AM**

Ms. Day commented on the South Terminal Redevelopment Program and said that the new Westin Hotel and Conference Center will open in the summer of 2015. She commented on the issue of Pena Boulevard being used by non-airport travelers. She discussed volatile airline industries. Representative Tyler asked about costs related to DIA. Discussion ensued concerning DIA.

**09:47 AM** -- Mr. David Gordon, representing CDOT, distributed a handout to the committee (Attachment D). He commented on the Division of Aeronautics and its mission. He said that the economic benefits of Colorado's airports is updated every two years. He discussed the Colorado aviation tax revenue structure and said that the division operates exclusively from aviation fuel tax revenues and receives no state General Fund dollars. He noted special projects that the division is working on, including the airport directory, a state-wide system plan, and the economic impact update study. Handouts were distributed to the committee (Attachments E, Attachment F, and Attachment G).

**10:00 AM** -- Mr. Jason Licon, representing Fort Collins-Loveland Airport, explained that he is representing the Colorado Airport Operators Association (CAOA). He commented on the mission of the CAO. He gave an update on the Fort Collins-Loveland airport.

**10:10 AM**

Representative Kraft-Tharp commented on the economic impact of aviation in Colorado and asked for any policy needs of which the committee should be made aware. Mr. Licon commented on the need for continuation of the aviation fuel tax program. Mr. Gordon commented on the department's obligation to implement programs and policies as they are enacted by the legislature.

**10:13 AM -- Report on the Waste Tire Program**

The committee took a brief recess.

**10:22 AM**

The committee came back to order.

**10:22 AM** -- Mr. Charles Johnson and Mr. Brian Gaboriau, representing the Colorado Department of Public Health and Environment (CPDHE), introduced themselves to the committee. Handouts were distributed to the committee (Attachment H, Attachment I, Attachment J, Attachment K, and Attachment L). Mr. Johnson discussed Attachment K, the 2012 annual report to the Transportation Legislation Review Committee (TLRC). He gave an overview of Colorado's waste tire activity. Mr. Gaboriau commented on the Colorado Waste Tire Market Development Plan (Attachment L). He said that the market development plan is a third-party independently looking at end-user markets, storage, and grant programs that are managed by the state. He said that 65 different stakeholders in the state were involved in a survey to get an overall idea of where the state stands in the waste tire market and how to expand those markets. The survey also considered efficiency in the management of the state grant programs.

**10:33 AM**

Representative Peniston asked for more information about "alternative daily cover." Mr. Johnson said that alternative daily cover is a term used for landfills. Discussion ensued concerning why Colorado takes waste tires from other states. Representative Primavera asked about the recycling of waste tires. Discussion ensued concerning the environmental impact of burying waste tires. Representative Kraft-Tharp asked for more information about the market development plan. Discussion ensued concerning implementation of the market development plan.

**10:52 AM**

Representative Tyler asked if the grant program may focus on leveraging capitol equipment. Mr. Gaboriau said that the department is considering a grant program and that there are studies showing that tires burn cleaner and more efficiency than coal.

**10:53 AM**

Representative Mitsch Bush asked for more information concerning investment options.

**11:01 AM**

Representative Primavera asked about grants for waste tire research projects. Mr. Gaboriau commented on concerns associated with managing research project grants. Representative Tyler asked about the collection of money for waste tires. Mr. Johnson said that he suspects the state may not be collecting the money that is out there for waste tires and that they are trying to identify the gaps in collections. He commented on interpretation of the law by the Department of Revenue (DOR) and CDPHE. He said that CDPHE is working with DOR to match information for retailers with the fees being collected.

**11:06 AM**

Discussion ensued concerning cement plants and the impact on waste tires. Mr. Johnson commented on cement plants in the state and the use of tires for fuel. He discussed alternative daily cover and said that diversifying the marketplace is key. Mr. Gaboriau said that only a few landfills utilize alternative daily cover right now. He said that the state is looking at all options for diversification of the marketplace.

**11:18 AM**

Senator Heath asked about the processor and end-user reimbursement program. Discussion ensued concerning the formula for the reimbursement program.

**11:32 AM**

Representative Kraft-Tharp asked for clarification on how the reimbursement program works under current law. Discussion ensued concerning the cost of the waste tire program.

**11:40 AM**

Representative Lawrence asked about the documentation required for applications. Representative Mitsch Bush asked about partial reimbursement rates. Senator Heath expressed that he would like to request an audit of the waste tire program to get a better understanding of program fees and costs. Discussion ensued concerning how the waste tire program currently functions and interpretation of current law.

**11:58 AM**

The committee took a recess for lunch.

**01:00 PM -- Public Utilities Commission Report**

The committee came back to order.

**01:06 PM --** Mr. Ron Jack, representing the Public Utilities Commission (PUC), introduced himself to the committee. Mr. Jack gave a brief overview of current law governing how PUC regulates and how the PUC is structured. Mr. Larry Harrold, representing the PUC, commented on the application fees for carriers in the state. Mr. Jack discussed rate cases.

**01:24 PM --** Mr. Cliff Vincent, representing PUC, introduced himself to the committee and discussed safety compliance and investigation reviews. He commented on consumer protection and said that the PUC has received positive responses to town hall meetings they have held.

**01:40 PM**

Representative Tyler asked for more information about violators. Mr. Vincent said that illegal operators are spread across the state. Representative Buck asked for more information about statistical data. Discussion ensued concerning penalties for violators and illegal operations.

**01:47 PM**

Representative Primavera asked for more information about household movers. Discussion ensued concerning finger printing and background checks for household movers.

**01:53 PM**

Mr. Harrold commented on common contract carriers and modified regulation.

**02:00 PM**

Representative Mitsch Bush asked about regulation of for-hire transportation.

**02:01 PM**

Mr. Jack commented on the carrier base for which the PUC is responsible. He gave a brief overview of the history of transportation standards in the state and discussed recent developments with companies who are pushing the limit under the regulation of for-hire transportation.

**02:15 PM**

Representative Tyler asked for more information about public safety issues related to carriers who seek to be exempt from PUC regulations. Discussion ensued concerning common carriers. Representative Peniston asked if school buses are regulated by the PUC. Mr. Jack said that generally school buses are not regulated by the PUC.

**02:24 PM**

Mr. Harrold gave a brief overview of Medicaid transportation.

**02:29 PM**

Mr. Vincent discussed criminal history background checks and finger printing.

**02:34 PM -- Colorado Motor Carriers Association**

The committee took a brief recess.

**02:51 PM**

The committee came back to order.

**02:52 PM --** Mr. RJ Hicks, representing the Western State Transportation Alliance, introduced himself to the committee. A handout was distributed (Attachment M). He commented on highway funding and ways to increase productivity and efficiency.

**03:10 PM --** Mr. Greg Fulton, representing the Colorado Motor Carriers Association (CMCA), introduced himself to the committee. Handouts were distributed to the committee (Attachment N and Attachment O). Mr. Fulton said that 2010 was the best year in recorded truck history for truck fatality rates. He commented on the I-70 mountain corridor and gave a brief overview of proposed environmental and energy strategies, including alternative fuels. He commented on key legislative and regulatory concerns in Colorado, including oversize/overweight permits by local communities, truck productivity, and access issues.

**03:34 PM**

Representative Peniston asked about the impact to motor carriers if they were asked to stay off the I-25 metropolitan corridor during rush hour traffic. Representative Mitsch Bush asked about education and information programs. Senator Todd asked about ways to attract drivers and mechanics and avoid shortages. Representative Lee asked about challenges facing owner-operators.

**03:52 PM**

The committee adjourned.



Colorado  
Legislative  
Council  
Staff

Room 029 State Capitol, Denver, CO 80203-1784  
(303) 866-3521 FAX: 866-3855 TDD: 866-3472

---

**MEMORANDUM**

July 16, 2013

**TO:** Transportation Legislation Review Committee

**FROM:** Kelli Kelly, Research Associate, 303-866-3518  
Kristen Johnson, Research Analyst, 303-866-4918  
Jonathan Senft, Fiscal Analyst, 303-886-3523

**SUBJECT:** Committee Statutory Authority and History

This memorandum provides the following information regarding the Transportation Legislation Review Committee (TLRC):

- history and membership of the committee;
- the committee's statutory charge and oversight authority;
- required reports for submission to the committee;
- the committee's 2012 interim activities; and
- TLRC proposed legislation from 2003 to 2012.

#### **History of the TLRC**

In 1953, the General Assembly restructured the relationship between state highway, county road, and municipal street systems. The Highway Legislation Review Committee was responsible for reviewing the implementation and impact of the newly structured highway systems. In 1987, the General Assembly expanded the committee's charge to include oversight of public highway authorities and projects. In 1989, the General Assembly began requiring the Regional Transportation District (RTD) to respond to the committee's requests for information.

In 1994, the committee's name was changed to the Transportation Legislation Review Committee to correspond with the renaming of the Colorado Department of Highways to the Colorado Department of Transportation (CDOT). With the name change, the scope of the committee's responsibilities expanded to parallel the department's broader focus on all transportation modes. In 1997, the committee's authority changed to include oversight of regional transportation authorities. In 2001, the membership of the committee changed from 11 members appointed by the Governor, Speaker of the House of Representatives, and the President of the Senate, to the members of the House and Senate transportation committees of reference.

In 2007, the General Assembly amended the committee's charge to include oversight over the Department of Revenue (DOR) in the area of driver's licenses and motor vehicle registration, as well as any other state agency or political subdivision of the state regulating motor vehicles or traffic.

## Committee Membership

The TLRC is comprised of the members of the Senate and House transportation committees of reference. The Senate Transportation Committee has 5 members, and the House Transportation and Energy Committee has 13 members. Therefore, the TLRC is comprised of 18 members. The TLRC is chaired by the House Transportation and Energy Committee chair in odd-numbered years and by the Senate Transportation Committee chair in even-numbered years.<sup>1</sup> The Legislative Council Staff provides staff support to the committee.<sup>2</sup>

## Statutory Charge

Pursuant to state law, the TLRC must meet at least once a year to:

- provide guidance and direction to CDOT on the development of the state transportation system and DOR or any other state agency or political subdivision of the state that regulates motor vehicles or traffic;
- provide legislative oversight of and input into such development; and
- review all transportation, traffic, and motor vehicle legislation, and make recommendations for additional legislation as necessary.<sup>3</sup>

In 1995, the General Assembly also directed the TLRC to examine the problem of uninsured motorists in the state and to recommend legislation relating to uninsured motorists. The committee is also directed to examine the effectiveness of uninsured motorist enforcement mechanisms in use by other states.<sup>4</sup>

## Oversight Role and Statutory Authority

State law provides the TLRC with authority over CDOT, driver licensing and vehicle registration functions of the DOR, the Regional Transportation District (RTD), public highway authorities (PHAs), regional transportation authorities (RTAs), and railroads. In its oversight role, the committee is authorized to:

- develop and make state transportation system financing recommendations;
- review the operations of CDOT, RTD, any PHA, and any RTA;
- review completed highway projects, including whether the projects were completed in the most cost-effective and efficient manner; and
- request financial or performance audits.

---

<sup>1</sup>Section 43-2-145 (2.5), C.R.S.

<sup>2</sup>Section 43-2-145 (5), C.R.S.

<sup>3</sup>Section 43-2-145 (1)(b), C.R.S.

<sup>4</sup>Section 42-7-602, C.R.S.

Upon completion of the TLRC's review of transportation law, the committee is authorized to make recommendations for legislation deemed necessary by the TLRC. Such legislation recommended by the TLRC is treated as interim committee legislation for the purposes of legislative deadlines imposed by the General Assembly rules.<sup>5</sup>

**Colorado Department of Transportation.** Under state law, the TLRC is authorized to:

- provide guidance and direction to CDOT in the development of the state transportation system;
- make recommendations on the financing of the state transportation system;
- review all transportation legislation and consult with experts in the field of highway construction and planning or with CDOT personnel;
- review any phase of CDOT operations;
- conduct postoperation reviews to determine cost-effectiveness and efficiency of certain transportation projects;
- require CDOT to prepare and adopt 5-, 10-, and 15-year plans; and
- require financial or performance audits to be conducted.<sup>6</sup>

**Colorado Department of Revenue.** The TLRC may review the activities of the DOR relating to the licensing of drivers and the registration and titling of motor vehicles.<sup>7</sup>

**Regional Transportation District.** The TLRC is required to review the RTD's implementation of competitive contracting for its vehicular services. State law authorizes the RTD to contract with private businesses to provide up to 58 percent of its vehicular services.<sup>8</sup>

**Public highway authorities and regional transportation authorities.** The TLRC may review any phase of a PHA's or RTA's operations and may require a PHA or RTA to prepare and adopt long-range plans for the development of public highways. The committee may also require financial or performance audits to be conducted of any PHA or RTA.<sup>9 10</sup>

**Railroads.** The TLRC is directed to study CDOT recommendations and may hold hearings regarding the acquisition or use of abandoned or proposed to be abandoned railroad rights-of-way and to determine the priority of acquiring or using abandoned or proposed to be abandoned railroad rights-of-way. The TLRC is required to report its findings to the General Assembly regarding the acquisition of abandoned railroad rights-of-way.<sup>11</sup>

---

<sup>5</sup>Section 43-2-145 (1)(c), C.R.S.

<sup>6</sup>Section 43-2-145 (1), C.R.S.

<sup>7</sup>Section 43-2-145 (1)(a), C.R.S.

<sup>8</sup>Section 32-9-119.5, C.R.S.

<sup>9</sup>Sections 43-2-145 (1.5) and (1.9), C.R.S.

<sup>10</sup>Section 2-3-121, C.R.S.

<sup>11</sup>Section 43-1-1308, C.R.S.

**Other agencies.** The TLRC may require agencies to share information and coordinate efforts for phases of transit system development to avoid overlapping mass transit systems within the state. Such agencies include the Denver Regional Council of Governments (DRCOG), the Intermountain Fixed Guideway Authority, and state, regional, and local authorities or organizations responsible for mass transit.<sup>12</sup>

## **Reporting Requirements**

State law requires that various reports be submitted to the TLRC. Table 1 provides a summary of each report. Upon receipt of reports, copies are made available to TLRC members by staff. Table 2 provides a summary of each report that is required to be submitted to the senate and house transportation committees.

---

<sup>12</sup>Section 43-2-145 (1.3), C.R.S.

**Table 1**  
**Statutorily Required Departmental Reports**  
**to the Transportation Legislation Review Committee (as of July 1, 2013)**

Department	Report Subject/Statute	Summary
Department of Local Affairs (DOLA)	Public Highway Authorities Section 43-4-514 (3), C.R.S.	The Division of Local Government, DOLA, is required to provide an annual report to the TLRC regarding public highway authorities. The report must include how many authorities have been created, their boundaries, and information regarding public highways to be constructed and their financing.
Department of Public Health and Environment (CDPHE)	Proposed PHA Boundaries Section 43-4-514 (1), C.R.S.	The Division of Local Government, DOLA, is required to provide copies to the TLRC of any notice containing proposed boundaries or financing of a PHA.
Department of Public Health and Environment (CDPHE)	Waste Tires Recycled Section 25-17-202.7, C.R.S.	The CDPHE is required to report annually the total number of waste tires recycled in Colorado. Reports are required annually on July 1 through 2014.
	Waste Tire Recycling Rules Promulgated Section 25-17-207 (1), C.R.S.	Once the Solid and Hazardous Waste Commission has promulgated rules administering various waste tire recycling, funding, and enforcement requirements established under House Bill 10-1018, the CDPHE is required to report to the TLRC on the new rules.
Department of Revenue (DOR)	Effectiveness of Emissions Programs Section 42-4-305 (1), C.R.S.	The DOR is required to report annually to the TLRC on the effectiveness of emissions programs.
Department of Transportation (CDOT)	Drunken Driving Prevention and Law Enforcement Program Section 43-4-404, C.R.S.	The Office of Transportation Safety, CDOT, is required to report annually to the TLRC on the distribution and expenditure of funds for drunk driving enforcement programs.
	Potential Rail Line Acquisitions Section 43-1-1303 (3), C.R.S.	CDOT is required to submit a prioritized list to the TLRC concerning railroad rights-of-way or rail lines proposed to be acquired by the state and their proposed uses.
Regional Transportation District (RTD)	RTD Annual Budget Section 32-9-119.7 (4) and (7), C.R.S.	RTD is required to provide copies of the RTD annual budget to the TLRC. State law also requires the RTD to provide other information, data, testimony, or audits as requested by the TLRC.

**Table 2  
 Statutorily Required Departmental Reports  
 to the House and Senate Transportation Committees (as of July 1, 2013)**

<b>Department</b>	<b>Report Subject/Statute</b>	<b>Summary</b>
Department of Corrections (DOC)	License Plate, Decal, and Tab Fees Section 42-3-301 (2)(a), C.R.S.	The Division of Correctional Industries must submit a report every five years detailing any changes that occurred within the preceding five years in the amount of fee imposed for license plates, decals, or tabs, and the reason for the change in the fee.
Department of Personnel & Administration (DPA)	Natural Gas Motor Vehicle Purchases Section 24-30-1104 (V), C.R.S.	The DPA is required to submit an annual report that includes information on the number of vehicles purchased for the Motor Vehicle Fleet System (MVFS) since January 1, 2008, that operate on compressed natural gas and other alternative fuels; an estimate of the number of dedicated petroleum fuel vehicles that were purchased for the MVFS since January 1, 2008; an explanation of the compressed natural gas fueling infrastructure; and a summary of the policies or procedures in place within DPA to facilitate the purchase of compressed natural gas and other alternative fuel vehicles, among other things.
Department of Public Health and Environment (DPHE)	Waste Tire Clean Up Program Section 25-17-207 (1)(c), C.R.S.	The DPHE is required to submit an annual report on the status of the waste tire cleanup program.
	Waste Tire Advisory Committee Recommendations Section 25-17-208 (2), C.R.S.	The Waste Tire Advisory Committee within the DPHE may present recommendations regarding the allocation of the waste tire fee as deemed appropriate.
Department of Regulatory Agencies (DORA)	Energy Rate Cases Section 40-2-103 (2), C.R.S.	The Public Utilities Commission (PUC) within the DORA must annually report on any energy rate cases that were brought before the PUC during the immediately preceding two years. The report must include a summary of the issues and outcomes of each case and any rate adjustments made as a result.
Department of Transportation (CDOT)	Capital Construction Request Section 2-3-1304 (1)(a.5), C.R.S.	The Transportation Commission is required to annually submit its capital construction request, based on statewide transportation improvement programs, with a prioritized list of recommended state highway construction, repair, and maintenance projects.
	Fatal Accidents in State Highway Work Areas Section 42-4-1612, C.R.S.	The CDOT and the Colorado State Patrol are required to annually submit a joint report regarding fatal accidents in state highway work areas during the preceding year.
	Efficiency and Accountability Committee Report Section 43-1-106 (17)(b), C.R.S.	The CDOT's efficiency and accountability committee must annually report its activities and recommendations, and any actions taken by the CDOT or Transportation Commission to implement the committee's recommendations. The report is to be made to either the TLRC, or to the House and Senate standing committees that have oversight over transportation.

**Table 2 (Cont.)  
 Statutorily Required Departmental Reports  
 to the House and Senate Transportation Committees (as of July 1, 2013)**

Department	Report Subject/Statute	Summary
Department of Transportation (CDOT) (Cont.)	Proposed Budget Allocation Plan Section 43-1-113 (2), C.R.S.	The Transportation Commission must annually submit a proposed budget allocation plan for moneys subject to its jurisdiction for the fiscal year beginning on July 1 of the succeeding year.
	Transportation Revenue Anticipation Notes Section 43-4-713 (1), C.R.S.	The CDOT Executive Director is required to annually submit a report that provides information regarding transportation revenue anticipation notes issued by the department.
	Colorado Bridge Enterprise Section 43-4-805 (6), C.R.S.	The Colorado Bridge Enterprise is required to annually submit a report that details the activities of the enterprise for the previous year, a summary of the status of any current bridge projects, a statement of the enterprise's revenues and expenses, an estimate of the number of jobs created or preserved as a result of the enterprise's activities, and any recommendations for statutory changes that the enterprise may deem necessary or desirable.
	Colorado High Performance Transportation Enterprise Section 43-4-806 (10), C.R.S.	The High Performance Transportation Enterprise is required to submit an annual report that includes the enterprise's activities for the previous year, a status summary of any current surface transportation infrastructure projects, the enterprise's revenues and expenses statement, and any recommendations for statutory changes that the enterprise may deem necessary or desirable.
	Transportation Deficit Report Section 43-4-813, C.R.S.	CDOT must annually submit a transportation deficit report that addresses the goals of repairing deficient highways and bridges, sustaining existing transportation system performance levels, and achieving the corridor visions described by regional transportation plans and public preferences.
	Motorcycle Operator Safety Training Program Section 43-5-506, C.R.S.	CDOT must submit an annual report that comments on the effectiveness of the motorcycle operator safety training program, annual motorcycle accidents or fatalities, availability of training throughout the state, historic and current training costs, and other performance measures.
Governor's Office	Colorado Clean Energy Finance Program Section 24-38.7-104 (3)(b), C.R.S.	The Governor's Energy Office is required to submit an annual report to the House Transportation and Energy committee regarding the Colorado Clean Energy Finance Program.
Regional Transportation District (RTD)	District Area Description Section 32-9-106.1 (2)(d) and (3)(c), C.R.S.	The RTD is required to provide a map and written description within 30 days of any additional area being annexed or included in the district, or after any area is removed from the district for any reason. In addition, a separate map and description must also be provided depicting the district areas in each county.

## 2012 Interim Activities

The TLRC held four meetings pertaining to transportation and motor vehicles during the 2012 interim. Briefings and presentations were made by state departments, local governments, transit authorities, public highway authorities, and transportation industry associations on a wide range of subjects, including: highways and toll roads; the ports of entry; the motor carrier industry; aviation; alternative fuel vehicles; public mass transit; rail transportation; driver's licenses; special license plates; and other policy areas.

**Alternative fuel vehicles.** The committee heard testimony from the DOR concerning alternative fuel vehicles. According to the department, as of July 2012, there were over 50,000 cars registered as alternative fuel vehicles, with four-fifths of those vehicles categorized as electric/gas. Under current law, the DPA is required to purchase compressed natural gas (CNG) vehicles if the life cycle or base cost of the vehicle does not exceed 10 percent over the cost of dedicated petroleum vehicle. As a result of this discussion, the committee recommended Bill B (Senate Bill 13-070), which expands the Department of Public Administration's (DPA) use of alternative fuel vehicles and requires DPA to report on its fleet in connection with fuel types. An amended version of the bill, which was signed into law, is explained in more detail in Table 2.

**Special license plates.** In addition, the DOR presented information on special license plates, including a review of the application process, existing and retired plate types, and the state's plans to move towards a print-on-demand system to assist county offices in managing license plate inventories. In 2012, there were 82 special license plate types registered to just over 600,000 vehicles, with 7 new special license plates available January 1, 2013. As a result of this discussion, the committee recommended two bills. The committee recommended Bill C (Senate Bill 13-081), which changes the stated penalty on the notice for motor vehicle registration for the act of failure to register a vehicle from \$100 to \$500. The bill also retires the U.S. Olympic Committee and Colorado Foundation for Agriculture and Natural Resources specialty license plates. The bill, which was signed into law, is explained in more detail in Table 2.

The committee also recommended Bill G (House Bill 13-1028), which sought to limit the number of unique alumni, designer, military, or group special license plate designs to 96. The bill was postponed indefinitely.

**Fixed guideway rail systems.** The committee heard testimony from the Public Utilities Commission (PUC) regarding federal reporting requirements and legislation modifying the funding of the PUC's Safety Oversight Program. The PUC also discussed the implementation of House Bill 12-1327, which repealed the requirement that a towing carrier maintain a \$50,000 surety bond to pay a civil penalty assessed against it by the PUC. As a result of this testimony and discussion, the committee recommended Bill H (House Bill 13-1103), which conforms Colorado law with new federal requirements that prohibit the PUC from assessing administrative fees on any rail fixed guideway system that it regulates. Under the bill, the PUC is exempt from annual reporting on the RTD rail system to the DOR. The bill was signed into law.

**Special mobile machinery.** The committee heard testimony regarding the collection of specific ownership tax (SOT) on special mobile machinery (SMM). The TLRC recommended Bill E (House Bill 13-1153), which allows fleet owners of SMM to file or report electronically with the DOR. Under the bill, fleet owners are permitted to pay the SOT directly to the DOR, as opposed to the county clerks where each fleet vehicle operates. The bill was signed into law.

**Other policy areas.** The committee also discussed certain fees on a driver's license or state identification card, the composition of the Transportation Commission, and penalties for driving while under the influence of marijuana. As a result of the discussion, the committee recommended Bill F (House Bill 13-1011), which eliminates the \$15 fee to add a military identifier to an applicant's driver's license or state identification card to show a service member's branch of service. The bill was signed into law.

In addition, the committee recommended Bill A (House Bill 13-1030), which proposed to add two at-large members to the Transportation Commission. The two at-large members would have been appointed by the Governor to represent the entire state, with one at-large member residing on the western slope, and the other at-large member residing on the eastern slope. The bill was postponed indefinitely.

The committee also recommended Bill D, which would have expanded the "DUI per se" statute to include driving while a driver's blood contains five nanograms or more of delta 9-tetrahydrocannabinol per milliliter of whole blood. The bill was not approved by Legislative Council at its meeting on October 15, 2012, although a similar bill was passed in 2013.

#### **TLRC Proposed Legislation - 2003 to 2012**

Legislation recommended by the TLRC is treated as legislation recommended by an interim committee for purposes of introduction deadlines or bill limitations imposed by the General Assembly's joint rules. From the 2003 interim to the 2012 interim, the TLRC proposed 55 bills that were approved by the Legislative Council. Of the 55 bills, 47 became law.

Table 3 provides legislation approved by the Legislative Council. Table 4 provides legislation not approved by the Legislative Council. Bills are identified according to identifier (Bill A, Bill B, Bill C, etc.) used in the final TLRC report provided to the Legislative Council and bill numbers assigned upon introduction during session.

**Table 3  
Transportation Legislation Review Committee  
Bills Approved by the Legislative Council by Issue Area - Interim Sessions 2003 to 2012**

Bill Letter/ Number	Bill Title	Brief Description of Bill	Became Law
<b>Driver's Licenses</b>			
HB 13-1011 Bill F	Repeal Fee Veteran's Identifier Driver's License	The bill eliminates the \$15 fee to add a military identifier to show a service member's branch of service on an applicant's driver's license or state identification card.	Yes
HB 12-1035 Bill E	Repeal Veterans Identifier Fee	This bill would have eliminated the \$15 fee to add a military identifier on an applicant's driver's license. A bill that passed in 2010 allowed a military service member or veteran to add an identifier to his or her driver's license or state identification card for a \$15 fee. The identifier indicates the branch of service of the applicant.	No
SB 10-015 Bill D	Graduated Drivers Education Licensing	Prior to the bill's passage, if a minor, under age 18, qualified for his or her driving permit by taking the 30-hour driver's education course, he or she must complete the additional behind-the-wheel requirements to qualify for a driver's license. In certain cases, this behind-the-wheel requirement was more stringent than is required of the person's peers (who received their permits under less rigorous requirements). This bill eliminated any differences by making the age cut-off for the additional behind the wheel training 16 years and 6 months.	Yes
SB 05-036 Bill A	Minor Passengers Minor Drivers	<p>Senate Bill 05-036 prohibited a minor driver who has held a license less than six months from transporting a passenger who is under 21 years of age. The bill also prohibited a minor driver who has held a license for less than one year from transporting more than one person under 21 years of age, with the following exceptions:</p> <ul style="list-style-type: none"> <li>• if the motor vehicle also contains the minor's parent, legal guardian, or other responsible adult;</li> <li>• if the motor vehicle also contains a 21-year-old driver;</li> <li>• if the passenger is in the vehicle on account of a medical emergency; or</li> <li>• if all the passengers are members of the driver's immediate family.</li> </ul> <p>Further, the bill prohibited a minor driver who has held a license for less than one year from driving between 12 midnight and 5 a.m., with the following exceptions:</p> <ul style="list-style-type: none"> <li>• if the motor vehicle contains the minor's parent, legal guardian, or other responsible adult;</li> <li>• if the motor vehicle contains a 21-year-old driver;</li> <li>• if the driving is on account of a medical emergency;</li> <li>• if the driving is on account of school or a school-authorized activity when the school does not provide adequate transportation;</li> <li>• if the driving is on account of employment when necessary; or</li> <li>• if the minor is emancipated.</li> </ul> <p>Finally, the bill imposed punishments for violating such prohibitions, including community service, fines, and license suspension points.</p>	Yes

**Table 3 (Cont.)  
Transportation Legislation Review Committee  
Bills Approved by the Legislative Council by Issue Area - Interim Sessions 2003 to 2012**

Bill Letter/ Number	Bill Title	Brief Description of Bill	Became Law
<b>Driver's Licenses (Cont.)</b>			
HB 04-1017 Bill L	Graduated Driver's Licenses	<p>House Bill 04-1017 addressed graduated driver's licenses. Specifically, the bill:</p> <ul style="list-style-type: none"> <li>• raised from 6 months to 1 year the required holding period for an instruction permit before a minor may obtain a driver's license;</li> <li>• raised from 15 and 1/2 years to 16 years old the age when a person may obtain an instruction permit without first meeting any driver's educational requirements; and</li> <li>• authorized a person who is 15 and 1/2 years old to obtain an instruction permit if such person has completed a pre-qualification driver awareness program.</li> </ul> <p>The bill also:</p> <ul style="list-style-type: none"> <li>• authorized stepparents to assume liability for minor drivers, sign for instruction permits, and accompany certain minors with instruction permits; and</li> <li>• instructed the Commissioner of Insurance to report to the General Assembly the effect of graduated driver's licenses on insurance premiums.</li> </ul>	Yes
HB 04-1034 Bill N	Internet Renewal of Drivers' Licenses	<p>House Bill 04-1034 allowed drivers to renew a driver's license through the Internet. Specifically, the bill:</p> <ul style="list-style-type: none"> <li>• allows a driver to renew his or her driver's license via the Internet when the driver is at least 21 years of age, but under 61 years of age;</li> <li>• allows the DOR to promulgate rules to implement Internet renewals;</li> <li>• required the DOR to submit to the Commission on Information and Technology the DOR's plan for implementing Internet renewal of driver's licenses;</li> <li>• requires the DOR to develop and implement information security programs; and</li> <li>• required the DOR to report to the Transportation Legislation Review Committee the steps taken to accomplish Internet renewals.</li> </ul>	Yes
HB 04-1036 Bill D	Restrictions on Minor Passengers in Vehicles	<p>House Bill 04-1036 would have prohibited minor drivers from driving with minor passengers with specified exemptions.</p>	No

**Table 3 (Cont.)  
Transportation Legislation Review Committee  
Bills Approved by the Legislative Council by Issue Area - Interim Sessions 2003 to 2012**

Bill Letter/ Number	Bill Title	Brief Description of Bill	Became Law
<b>Driver's Licenses (Cont.)</b>			
HB 04-1231 Bill P	Commercial Driver's License Act Updates	<p>House Bill 04-1231 addressed commercial driver's licenses by directing the DOR to adopt any licensing sanction imposed by federal statutes or rules governing commercial motor vehicle safety.</p> <p>The bill also required the DOR to maintain for at least three years records of a commercial driver's license application, convictions, disqualifications, and licensing actions affecting commercial driving privileges. The DOR must share the information with law enforcement authorities, the federal Secretary of Transportation, prospective employers, and the applicant upon request.</p> <p>Finally, the bill prohibited the issuance of a commercial driver's license to any person who is subject to a federal disqualification order; allows fingerprinting of an applicant for a hazardous materials endorsement; and prohibits the holder of a commercial driving learner's permit from obtaining a hazardous materials endorsement.</p>	Yes
SB 04-012 Bill O	Interlock Devices Driver's Licenses	<p>The bill removed the requirement that a court or peace officer provide information that authorizes the DOR to revoke a driver's license for tampering with a required interlock device.</p>	Yes
<b>Traffic Fines, Violations, and Signage</b>			
HB 08-1057 Bill C	Tourist-oriented Signs Along Rural Highways	<p>House Bill 08-1057 authorized the Department of Transportation to issue permits and adopt rules allowing tourist-oriented directional signs (TODS) along expressways and freeways in rural areas. Prior to the act, the state only permitted TODS on non-interstate highways in rural areas. The bill also expanded the types of signs that may be authorized along interstate highways pursuant to federal law. TODS are signs identifying nearby businesses for tourists traveling along state roadways.</p>	Yes
HB 08-1074 Bill D	Nonconforming Advertising Devices on Highways	<p>House Bill 08-1074 amended state law to authorize a nonconforming advertising device that was legally erected to be maintained at the same location. Prior to the act, only nonconforming advertising devices erected prior to January 1, 1971, were authorized to remain erected. The act eliminated the date references in statute.</p>	Yes
HB 08-1010 Bill F	Motor Vehicle Traffic Fines	<p>House Bill 08-1010 amended motor vehicle violation fines by:</p> <ul style="list-style-type: none"> <li>• increasing the minimum fine for a class 2 traffic misdemeanor from \$10 to \$150;</li> <li>• increasing the minimum fine for a class 1 traffic misdemeanor from \$100 to \$300;</li> <li>• reducing the distribution of seat belt violation fine revenue to local jurisdictions from 100 percent to 50 percent for violations occurring on state and federal highways, with the remaining 50 percent going to the Highway Users Tax Fund;</li> <li>• doubling the minimum fines for driving under the influence (DUI), driving while ability impaired (DWA), underage drinking and driving (UDD), and habitual user driving;</li> <li>• specifying that fine revenue from DUI, DWAI, UDD, and habitual user driving for violations occurring on a state or federal highway is credited 25 percent to the local governments and 75 percent to the Highway Users Tax Fund; and</li> <li>• doubling the minimum fine for vehicle eluding.</li> </ul>	Yes

**Table 3 (Cont.)  
Transportation Legislation Review Committee  
Bills Approved by the Legislative Council by Issue Area - Interim Sessions 2003 to 2012**

Bill Letter/ Number	Bill Title	Brief Description of Bill	Became Law
<b>Traffic Fines, Violations, and Signage (Cont.)</b>			
HB 04-1033 Bill J	Logo Signs on Interstate Highways	House Bill 04-1033 allowed CDOT to erect, maintain, and administer information signs within a populated area except in a federally defined "transportation management area." Such areas are designated by the U.S. Department of Transportation to establish comprehensive transportation programming and planning.	Yes
SB 05-009 Bill D	Increase Fine for Human Waste Dumping	Senate Bill 05-009 increased the fine for illicit disposal of containers of human waste upon or along a state highway from a fine of \$35 plus a \$2.50 surcharge to a flat fine of \$500.	Yes
HB 06-1039 Bill C	Roadside Advertising at Comprehensive Developments	House Bill 06-1039 allowed a specified on-premise advertising device located within a comprehensive development to advertise any activity conducted in the comprehensive development. The bill defines a comprehensive development as a group of two or more lots used for commercial or industrial activities that: <ul style="list-style-type: none"> <li>• is located on one side of a highway;</li> <li>• consists of contiguous lots or parcels, with the exception of access roadways;</li> <li>• has an approved public and private improvement plan;</li> <li>• has common areas such as parking and landscaping; and</li> <li>• has an approved common ownership plan.</li> </ul>	Yes
<b>License Plates</b>			
SB 13-081 Bill C	Vehicle Regis Penalty Statement Repeal Spec Plate	The bill changes the stated penalty on the notice of motor vehicle registration for the act of failure to register a vehicle from \$100 to a minimum penalty of \$500. The bill also reires the U.S. Olympic Committee and Colorado Foundation for Agriculture and Natural Resources specialty license plates.	Yes
HB 13-1028 Bill G	Vehicle Special License Plate Limit	The bill would have limited the number of designer, alumni, group special, and military license plate types (collectively known as special license plates) to 96. The DOR currently issues 82 special license plates.	No
SB 12-007 Bill G	Group Special License Plate Procedure	The bill altered the procedure for creating group special license plates. Specifically, the bill: <ul style="list-style-type: none"> <li>• removes the requirement that an applicant certify that at least 3,000 plates will be issued within one year;</li> <li>• allows special license plates to be sold until inventories are depleted; and</li> <li>• removes the requirement that proof of membership be provided to obtain certain license plates.</li> </ul>	Yes
HB 05-1247 Bill B	Breast Cancer Awareness License Plate	House Bill 05-1247 created the Breast Cancer Awareness special license plate, and set requirements for the issuance of the plate.	Yes

**Table 3 (Cont.)  
Transportation Legislation Review Committee  
Bills Approved by the Legislative Council by Issue Area - Interim Sessions 2003 to 2012**

Bill Letter/ Number	Bill Title	Brief Description of Bill	Became Law
<b>Alternative Fuel Vehicles</b>			
SB 13-070 Bill B	Alternative Fuel Fleet Vehicle	The bill requires the Department of Personnel and Administration (DPA) to report on the number of alternative fuel vehicles purchased, the availability of alternative fuel, and a plan for putting in place the infrastructure necessary to support the use of alternative fuel vehicles in the state's fleet, among other related criteria. The report is to be provided to the House and Senate transportation committees and the Joint Budget Committee on or before November 1, 2013, and each November 1 thereafter.	Yes
SB 12-013 Bill B	Low-speed Electric Vehicles	<p>Prior to the bill's passage, low-speed electric vehicles (LSEVs) were permitted to operate on roads with speed limits of 35 miles per hour (mph) or less, or on roads with speed limits greater than 35 miles per hour mph if crossing at grade with the road.</p> <p>This bill allows operation of LSEVs on roadways at speeds up to 35 miles per hour. The vehicles may be operated on a state highway or cross a roadway having a speed of 40 miles per hour under certain conditions. The bill also amends existing law to raise the age limit for driving golf cars on streets from age 14 to age 16.</p> <p>A LSEV is defined as:</p> <ul style="list-style-type: none"> <li>• primarily propelled by electricity;</li> <li>• having at least three wheels in contact with the ground;</li> <li>• not requiring handlebars for steering; and</li> <li>• displaying a vehicle identification number pursuant to state law.</li> </ul>	Yes
HB 09-1026 Bill D	Low-power Self-propelled Vehicles	<p>House Bill 09-1026 simplified Colorado's statutory definitions applicable to low-power self-propelled vehicles (scooters), created a category of speeding penalties specific to the vehicles, imposed a requirement for the purchase of liability insurance, and mandated the licensure of companies selling the vehicles. Specifically, the bill:</p> <ul style="list-style-type: none"> <li>• replaced several categories of self-propelled vehicles in Colorado law, including "motor-driven cycle," "motor scooter," and motorized bicycle" with the two categories "motorcycle" and "low-power scooter";</li> <li>• defines "low-power scooter" as a vehicle with not more than three wheels, no manual clutch, and a power capacity under 50 cubic centimeters or 4,476 watts;</li> <li>• put new speeding penalties in place for scooter operators who exceed 40 miles per hour, specifically: <ul style="list-style-type: none"> <li>• a fine of \$56 for traveling 41 to 44 miles per hour;</li> <li>• a fine of \$65 and 2 points for traveling 45 to 49 miles per hour; and</li> <li>• a fine of \$116 and 4 points for traveling 50 or more miles per hour;</li> </ul> </li> <li>• applies compulsory liability insurance laws to operators of low-power scooters, effective July 1, 2010;</li> <li>• requires persons selling low-power scooters to obtain a powersports vehicle distributor license from the DOR; and</li> <li>• specifies that drug and alcohol driving offenses apply to operators of low-power scooters, farm tractors, and off-highway vehicles, but not to bicycle operators.</li> </ul>	Yes

**Table 3 (Cont.)  
Transportation Legislation Review Committee  
Bills Approved by the Legislative Council by Issue Area - Interim Sessions 2003 to 2012**

Bill Letter/ Number	Bill Title	Brief Description of Bill	Became Law
<b>Commercial Vehicles</b>			
HB 07-1065 Bill A	Passenger Carrier Criminal History Check	House Bill 07-1065 required any individual seeking employment or already employed as a charter or scenic bus, fire crew transport, luxury limousine, off-road scenic charter, or children's activity bus motor vehicle driver to comply with a criminal history record check. Individuals convicted in this state or any other of a violent crime within the last ten years of the background check or of driving under the influence, driving with excessive alcoholic content, driving while ability impaired, or driving while an habitual user within the last two years are disqualified and prohibited from driving a motor vehicle for the aforementioned services.	Yes
HB 06-1035 Bill F	Passenger Vehicles Railroad Crossings	House Bill 06-1035 required a commercial vehicle transporting passengers, a school bus, or a vehicle carrying hazardous materials to stop before crossing street-grade railroad tracks within a residential area.	Yes
SB 06-008 Bill G	Hazardous Materials Commercial Vehicles	Senate Bill 06-008 required motor vehicles that weigh less than 10,000 pounds and transport hazardous materials to meet the minimum standards for commercial vehicles. The bill also: <ul style="list-style-type: none"> <li>• repealed a provision prohibiting a peace officer who has not attained Level I inspection certification from enforcing the "Hazardous Materials Transportation Act of 1987;"</li> <li>• changed the penalty for violating certain hazardous materials rules from a Class 3 misdemeanor criminal offense to a Class 2 misdemeanor traffic offense; and</li> <li>• set the penalty for such violation at \$250 with a \$33.30 surcharge and doubles the penalty for a repeat offense that occurs within 12 months.</li> </ul>	Yes
SB 06-010 Bill E	Commercial Vehicle Owner's Documentation	Senate Bill 06-010 authorized a company to file an express consent waiver enabling the company to designate a company representative to be party of interest in court for violation of the following: <ul style="list-style-type: none"> <li>• permits for longer vehicle combinations;</li> <li>• permits for excess size and weight vehicle combinations; and</li> <li>• permits for transporting hazardous materials.</li> </ul> <p>The bill also clarified that the appearance of the company representative in court covering the matter does not constitute the practice of law in violation of state law.</p>	Yes

**Table 3 (Cont.)  
Transportation Legislation Review Committee  
Bills Approved by the Legislative Council by Issue Area - Interim Sessions 2003 to 2012**

Bill Letter/ Number	Bill Title	Brief Description of Bill	Became Law
<b>Public Utilities Commission</b>			
HB 13-1103 Bill H	PUC Oversight of Rail Fixed Guideway System	The bill conforms Colorado law with new federal requirements that prohibit the Public Utilities Commission (PUC), Department of Regulatory Agencies (DORA), from assessing administrative fees on any rail fixed guideway system that it regulates. This provision takes effect after the PUC director notifies the Revisor of Statutes that federal grant moneys available under the "Moving Ahead for Progress in the 21st Century Act" have been awarded to the state. The only rail fixed guideway system in Colorado is the Regional Transportation District (RTD) rail system. Under federal law, the PUC oversees system safety by auditing the system and relevant records, including vehicle, signal, and track maintenance. The PUC is authorized to continue to assess RTD and pay its administrative expenses from the Fixed Utilities Fund for regulation of the RTD rail system until federal grant moneys are awarded. The bill also exempts the PUC from annual reporting on the RTD rail system to the DOR.	Yes
HB 07-1019 Bill E	Carrier Exempt Public Utilities	House Bill 07-1019 removed the current definition of a luxury limousine from state law and transferred the responsibility of defining a luxury limousine from the legislature to the PUC.	Yes
<b>Private Toll Roads</b>			
HB 06-1003 Bill A	Requirements for Private Toll Roads	House Bill 06-1003 required a corporation formed for the purpose of constructing a private toll road to meet specified requirements before the toll road may be constructed or approved.	Yes
SB 06-078 Bill B	Prohibit Eminent Domain for Private Toll Roads	Senate Bill 06-078 specified that a private corporation formed for the purpose of constructing a private toll road may not have the power to use eminent domain, but may enter into an agreement with a public entity to enable the construction of a private toll road.	Yes
SB 04-004 Bill I	Statewide Tolling Enterprise	Senate Bill 04-004 clarifies the division of responsibilities between the Board of the Statewide Tolling Enterprise and the Transportation Commission with respect to the operation of the tolling enterprise.	Yes

**Table 3 (Cont.)  
Transportation Legislation Review Committee  
Bills Approved by the Legislative Council by Issue Area - Interim Sessions 2003 to 2012**

Bill Letter/ Number	Bill Title	Brief Description of Bill	Became Law
<b>Special Mobile Machinery</b>			
HB 13-1153 Bill E	Ownership Tax Rental Mobile Machinery Electronic	The bill allows certain owners of special mobile machinery (SMM) fleets to file specific ownership tax (SOT) on rental equipment directly with the Department of Revenue (DOR) using an electronic system. The SOT is then paid by the fleet owner to the counties at the same proportions under current law. Fleet owners currently pay SOT in each county where the rental vehicles are used. The bill applies to fleet owners who belong to the 2 percent program, which allows fleet owners to pay SOT monthly, based on 2 percent of the rental income on SMM, rather than paying SOT annually based on the equipment's value.	Yes
HB 09-1029 Bill A	Mobile Machinery Vehicle Registration	Mobile machinery is machinery commonly used in the construction industry. The equipment may or may not be attached to a truck chassis, and may or may not be self-propelled. Examples of these vehicles (registered as Class F vehicles in Colorado) include concrete mixers, backhoes, bulldozers, and trucks with large generators attached. Class A vehicles are interstate commercial carriers. Most of Colorado's neighboring states register mobile machinery vehicles as Class A vehicles, and do not have a Class F category. This forces Colorado operators of Class F vehicles to purchase trip permits upon entering other states. Out-of-state mobile machinery vehicles entering Colorado are required to pay additional taxes and registration fees on their mobile machinery resulting in expense and delays at ports of entry. The bill would have addressed these issues by designating Colorado mobile machinery vehicles (Class F) operated in interstate commerce as Class A vehicles for purposes of imposing the graduated annual specific ownership tax, and specifying the same rate structure as is currently imposed on Class F personal property. Under the bill, out-of-state mobile machinery vehicles operating in Colorado would have been exempted from payment for the mounted equipment portion of the vehicle if that portion was already taxed by the registering base state, and would have been able to purchase a tab to cover the mounted equipment portion of the vehicle if taxes were due.	No
<b>Toll Evasion</b>			
SB 10-016 Bill A	Modify Toll Evasion Notice Process	<p>The bill modified how civil penalty notices of camera-detected toll evasion are provided to the vehicle's registered owner. Prior to the bill's passage, if the first penalty notice of toll evasion was unpaid or not responded to within 20 days, a second penalty notice was generated and sent by certified mail, return receipt requested. If the registered owner failed to pay or respond to the second penalty notice within 20 days, the notice constituted a complaint to appear for adjudication of a toll evasion in a court or administrative toll enforcement proceeding. The bill:</p> <ul style="list-style-type: none"> <li>• eliminated the second penalty notice requirement;</li> <li>• extended the time frame for payment or response to 30 days from the penalty notice;</li> <li>• required a final order of liability be entered against a registered owner who fails to respond to the penalty notice; and</li> <li>• clarified that administrative toll enforcement proceedings may be appealed in the county court where the violation occurred as a de novo (new) hearing.</li> </ul>	Yes

**Table 3 (Cont.)  
Transportation Legislation Review Committee  
Bills Approved by the Legislative Council by Issue Area - Interim Sessions 2003 to 2012**

Bill Letter/ Number	Bill Title	Brief Description of Bill	Became Law
<b>Toll Evasion (Cont.)</b>			
SB 08-014 Bill A	Toll Enforcement Process	Prior to the bill's passage, state law required toll evasion cases to be considered by the courts in the municipality or county where the violation occurred. For some municipalities and counties, this has resulted in a backlog of toll evasion cases in the court system. The act directed the Colorado Tolling Enterprise (CTE) to consider establishing an administrative toll enforcement process for toll evasion cases. If the CTE establishes an administrative toll enforcement process, no municipal, county, or city and county court will have the jurisdiction to hear toll evasion cases arising on a toll highway operated by the CTE. The act authorized the CTE to utilize every remedy available under the law to enforce unpaid tolls and fees as debts owed to the enterprise, and authorizes the CTE to report to the state DOR any outstanding judgement or warrant or failure to pay the toll, fee, and civil penalty for any toll evasion. Upon receipt of notice, the bill prohibits the DOR from renewing the registration of the vehicle associated with the toll evasion until the toll, fee, and civil penalty are paid in full.	Yes
<b>Transportation Commission</b>			
HB 13-1030 Bill A	Transportation Commission Members	This bill would have added two at-large members to the Transportation Commission. The two at-large members would have been appointed by the Governor to represent the entire state, with one at-large member residing on the western slope and the other residing on the eastern slope. The Transportation Commission currently has 11 members, each are appointed by the Governor and represent a single transportation district. The commission is required to meet at least eight times per year.	No
SB 08-012 Bill B	Transportation Commission Qualifications	Prior to the bill's passage, the Governor was required to consider appointing one or more individuals with knowledge or experience in aviation and one or more individuals with knowledge or experience in engineering to the state Transportation Commission. Senate Bill 08-012 eliminates the aviation consideration.	Yes
<b>Vehicle Specifications</b>			
HB 12-1038 Bill A	Multi-year Class A Trailer Registration	The bill established a permanent registration for Class A trailers and semitrailers. In order to qualify for the permanent registration, an owner must be either based outside of Colorado, or based in Colorado and in possession of a trailer 10 years or older. The new registration is permanent, but expires when the trailer or semitrailer transfers ownership.	Yes
SB 09-014 Bill C	Mud Flaps Vehicle Remain In Service	Senate Bill 09-014 allows commercial vehicles with damaged or missing splash guards to remain in service until the first reasonable opportunity to replace them. A splash guard is a device designed to minimize the spray of water and other substances to the rear of the commercial vehicle. Current Colorado law requires trucks with an empty weight that exceeds 10,000 pounds to be equipped with splash guards, and that a splash guard be at least as wide as the tire it covers.	Yes

**Table 3 (Cont.)  
 Transportation Legislation Review Committee  
 Bills Approved by the Legislative Council by Issue Area - Interim Sessions 2003 to 2012**

Bill Letter/ Number	Bill Title	Brief Description of Bill	Became Law
<b>Waste Tires</b>			
HB 12-1034 Bill D	Waste Tire Processor End User Fund	<p>The Processors and End Users Cash Fund consists of the \$1.50 fee collected on each new tire purchased in Colorado, as well as several other unexpended cash funds. Money in the fund is distributed to businesses that process waste tires to develop recycling technologies.</p> <p>This bill extended the Processors and End Users Cash Fund repeal date from July 1, 2012, to July 1, 2015. The bill also requires the General Assembly to appropriate the money in the fund, whereas prior to the bill's passage, these funds were continuously appropriated. Finally, it prevents the state from reimbursing a tire processor if the tire processor is not an end user, or if the tire product has been sold and moved off site.</p>	Yes
HB 10-1018 Bill B	Reduce Waste Tire Stockpile Risks	<p>Several state departments previously administered waste tire reduction and recycling programs funded by a \$1.50 per tire fee. The bill consolidated all waste tire programs under the Department of Public Health and Environment (CDPHE) and established new education and outreach requirements, fire planning and prevention requirements, and waste tire hauler and facility regulations.</p> <p><u>Funds.</u> The bill created the Waste Tire Fire Prevention Fund and Waste Tire Market Fund, repealed the Advanced Technology Fund, and updated state law on the Processors and End Users Fund and the Waste Tire Cleanup Fund. It redistributed waste tire fee revenue among existing funds and the three new funds.</p> <p><u>Grants and reimbursements.</u> The bill increased maximum reimbursements to processors and end users from \$50 to \$65 per ton of waste tires and repealed administration of the Waste Tire Cleanup Fund by DOLA.</p> <p><u>Waste tire haulers and facilities.</u> The bill established new regulations governing waste tire haulers, specifically requiring the display of decals and retention of travel log manifests and prohibiting haulers from transporting more than a set number of waste tires.</p> <p><u>Tire vendors' fee and sales tax.</u> Under previous law, sales tax was applied to the \$1.50 per tire fee. Tire vendors submitted fee and sales tax revenue to the DOR and retained 3.33 percent of fees for compliance costs. The bill repealed the vendors' fee and specified that sales tax is not assessed upon tire fees paid upon new tire sales.</p> <p><u>Advisory committee.</u> The bill created a nine-member Waste Tire Advisory Committee to provide feedback and assessment of the Waste Tire Cleanup Program, propose new rules, and make recommendations. The committee is repealed on July 1, 2020, following a sunset review.</p>	Yes

**Table 3 (Cont.)  
Transportation Legislation Review Committee  
Bills Approved by the Legislative Council by Issue Area - Interim Sessions 2003 to 2012**

Bill Letter/ Number	Bill Title	Brief Description of Bill	Became Law
<b>Work Zones</b>			
HB 10-1014 Bill E	Work Zone Accident Reporting	<p>The bill directed the Colorado Department of Transportation (CDOT) and the CSP to present a joint annual report on fatal accidents in state highway work areas to the House and Senate transportation committees. The report is to be delivered on or before February 15 of each year beginning in 2011, and, at a minimum, must include:</p> <ul style="list-style-type: none"> <li>• the total number of fatal accidents and individuals killed;</li> <li>• a breakdown of individuals killed to include CDOT workers, CDOT contractors and subcontractors, and others;</li> <li>• copies of all related accident reporting forms; and</li> <li>• information about ongoing and newly implemented measures taken by CDOT to prevent fatal accidents in state highway work areas.</li> </ul>	Yes
HB 08-1036 Bill E	Charles Mather Safety Act	<p>House Bill 08-1036 allowed both the CDOT and local governments to designate areas as maintenance, repair, or construction zones where such activities are occurring. The bill also:</p> <ul style="list-style-type: none"> <li>• repealed the \$40 maximum fine limit for violations occurring in these zones when an automated vehicle identification system, "photo radar," is used;</li> <li>• doubles the fines for specified moving traffic violations, including speeding, within the zones designated by local governments;</li> <li>• requires the Department of Public Safety, upon CDOT's request, to use photo radar to detect speeding violations while maintenance, repair, or construction is occurring in these zones;</li> <li>• requires CDOT to reimburse the Department of Public Safety for the use of photo radar; and</li> <li>• requires drivers approaching these zones to exhibit due care and yield the right-of-way to maintenance, repair, or construction vehicles.</li> </ul>	Yes

**Table 3 (Cont.)  
Transportation Legislation Review Committee  
Bills Approved by the Legislative Council by Issue Area - Interim Sessions 2003 to 2012**

Bill Letter/ Number	Bill Title	Brief Description of Bill	Became Law
<b>Miscellaneous</b>			
HB 12-1019 Bill C	Transfer Ports of Entry to State Patrol	<p>The bill designated the Colorado State Patrol (CSP), Department of Public Safety, as the enforcement and permit authority for Colorado ports of entry.</p> <p>Beginning on July 1, 2012, the Motor Carrier Services Division of the Division of Motor Vehicles, DOR, was abolished and its powers, duties and functions were transferred to the CSP, to include: statutory authority, personnel, property, funding, budgeting, purchasing, and planning for all state ports of entry. The DOR retained the commercial driver's license and international registration plan functions.</p> <p>The bill also specified that a port of entry officer has the authority of a peace officer to perform and enforce his or her duties, including restraining and detaining persons and/or vehicles and impounding vehicles under certain conditions. It also allows the CSP to set operating hours at ports of entry and all ports of entry officers to conduct safety inspections.</p>	Yes
HB 12-1030 Bill F	Repeal Transportation-related Reporting Requirements	<p>The bill would have repealed certain transportation and energy-related reports required to be submitted by the departments of Public Health and Environment, Transportation, and Revenue to various committees of the General Assembly, including the House and Senate transportation committees, and the Transportation Legislation Review Committee.</p>	No
HB 10-1019 Bill C	Reserved Disabled Parking Enforcement	<p>The bill made changes regarding the reserved parking program for the disabled and placards for persons with disabilities. Placard applications must include documentation from a doctor or other authorized professional certifying the disability under penalty of perjury. Confirmation of a disability is only required once every three years for a three-year placard. Placards are changed to have a "punch-out" system to identify expiration dates and have a sticker applied to it; much like a license plate. Fines are changed for illegal use of a placard or use of a parking space reserved for persons who are disabled.</p> <p>The bill also created a new cash fund, the Disabled Parking Education and Enforcement Fund, to provide moneys for a grant program or an education program about the eligibility standards, appropriate use of parking privileges, violations, and the advantages of a volunteer enforcement program. The fund receives one-half of reserved parking program ticket revenue. The grant and training programs are carried out by the Colorado Advisory Council for Persons with Disabilities in the Governor's Office.</p>	Yes
HB 09-1027 Bill B	Yield to Transit Bus Entering Traffic	<p>House Bill 09-1027 requires persons who are driving behind a transit bus to yield the right-of-way if the bus, after stopping to allow passengers to board or exit, signals an intention to enter traffic and if a yield sign on the back of the bus is illuminated. The bill did not require the installation of yield signs on transit buses, and did not relieve bus drivers of their duty to drive with due regard for the safety of other motorists.</p>	Yes

**Table 3 (Cont.)  
Transportation Legislation Review Committee  
Bills Approved by the Legislative Council by Issue Area - Interim Sessions 2003 to 2012**

Bill Letter/ Number	Bill Title	Brief Description of Bill	Became Law
<b>Miscellaneous (Cont.)</b>			
SB 07-006 Bill B	Redundant Railroad Crossings	Senate Bill 07-006 authorized a railroad corporation, the state Transportation Commission, CDOT, or a local government responsible for supervising and maintaining the intersecting public highway or road to abolish any railroad crossing if: <ul style="list-style-type: none"> <li>• the crossing is without gates, signals, alarm bells, or warning personnel and is located within a quarter-mile of a crossing with gates, signals, alarm bells, or warning personnel;</li> <li>• the crossing is not the only crossing that provides access to property;</li> <li>• proper notification of the proposed abolition is posted; and</li> <li>• no entity that was provided notice or any other interested party files an objection to the abolition.</li> </ul>	Yes
HB 07-1018 Bill F	Transportation Legislation Review Committee	House Bill 07-1018 expanded the statutory charge of the TLRC to include oversight of the DOR's licensing of drivers and registration and titling of motor vehicles. The bill also expanded the charge to include oversight over any state agency or political subdivision of the state that regulates motor vehicles or traffic.	Yes
HB 05-1004 Bill C	Good Samaritan Law for Employers of Truckers	House Bill 05-1004 would have exempted an employer from civil liability for acts or omissions made by an employee while rendering emergency care or assistance.	No
HB 04-1019 Bill F	Public Airport Authority Contracts	House Bill 04-1019 required a public airport authority to invite bids and award a contract for the construction of works, structures, or equipment or the performance or furnishing of labor, materials, or supplies to the lowest bidder if the value of the contract is \$50,000 or more.	Yes
HB 04-1021 Bill G	Concerning the Consumption of Alcohol	House Bill 04-1021 lowered the presumptive blood alcohol content limit for driving under the influence from 0.10 grams to 0.08 grams. The bill also permitted local governments to adopt an ordinance or resolution authorizing tastings subject to certain limitations; increased to \$1,000 the amount of malt, vinous, and spirituous liquors that a hotel and restaurant licensee may annually purchase from a retail liquor store; and authorized a hotel or restaurant to permit a customer to reseal and remove from the premises one opened container of partially consumed vinous liquor.	Yes
HB 04-1025 Bill E	New Diesel Vehicle Emissions Inspections	House Bill 04-1025 exempted a new diesel vehicle from an emissions inspection when sold, unless the current emissions certificate expired within 12 months.	Yes
SB 04-027 Bill M	Recodify Motor Vehicle Statutes	Senate Bill 04-027 would have recodified Articles 3 and 6 of Title 42, regarding motor vehicle titling, registration, and licensing, and amended provisions in Articles 2 and 4 of Title 42, regarding driver's licensing and traffic law, of the Colorado Revised Statutes.	No

**Table 4**  
**Transportation Legislation Review Committee**  
**Bills Not Approved by the Legislative Council 2003 to 2011**

Bill Letter/ Number	Bill Title	Brief Description of Bill	Became Law
<b>Interim Session 2012</b>			
Bill D	Penalty for DUI Involving Marijuana	The TLRC recommended Bill D to expand the definition of driving under the influence (DUI) to include driving when the driver's blood contains 5 nanograms or more of delta 9-tetrahydrocannabinol per milliliter in whole blood. The bill was not approved by Legislative Council as an interim committee bill; however, the bill was introduced as a regular bill and signed into law (HB 13-1325).	
<b>Interim Session 2011</b>			
All bills approved.			
(Per Senate Bill 10-213: 2010 interim committees were suspended)			
<b>Interim Session 2010</b>			
All bills approved.			
All bills approved.			
<b>Interim Session 2009</b>			
All bills approved.			
<b>Interim Session 2008</b>			
All bills approved.			
All bills approved.			
<b>Interim Session 2007</b>			
Bill G	Heavy-Duty Diesel Vehicle Emissions Test	The TLRC recommended Bill G to repeal the requirement for emissions testing of newer heavy-duty diesel vehicles for introduction during the 2008 legislative session; however, at the request of the bill's sponsor, the chair withdrew the bill from consideration at the Legislative Council Committee meeting. No motion was made to approve the bill for the 2008 legislative session.	
<b>Interim Session 2006</b>			
Bill C	Repeal CDOT Full-time Employee Cap	Bill C was not approved by the Legislative Council Committee as an interim committee bill. However the bill was introduced as a regular bill and signed into law. The bill eliminates CDOT's statutory full-time employee cap, which was set at 3,316.	
<b>Interim Session 2005</b>			
Bill D	Driver's License Persistent Drunk Driver	Bill D would have required that the driver's license held by a persistent drunk driver indicate for a five-year period that the holder is a persistent drunk driver.	

**Table 4 (Cont.)  
Transportation Legislation Review Committee  
Bills Not Approved by the Legislative Council 2003 to 2011**

Bill Letter/ Number	Bill Title	Brief Description of Bill	Became Law
<b>Interim Session 2004</b>			
Bill E	Driver's Licenses	<p>Bill E would have addressed minor drivers, motorcycle instruction permits, and renewing driver's licenses by mail. Specifically, the bill would have:</p> <ul style="list-style-type: none"> <li>• standardized the periods of license revocation so that minors without licenses received the same revocation as licensed drivers;</li> <li>• authorized a grandparent to sign a statement certifying that the minor was enrolled in a driver education course, supervise the minor driver on the road, and sign an application for the minor to receive a minor's instruction permit;</li> <li>• specified that a motorcycle instruction permit was valid for three years;</li> <li>• clarified that a sworn statement of a person's social security number was made under penalty of perjury;</li> <li>• lowered the age limit from 66 to 61 years of age when a person could no longer renew a driver's license by mail; and</li> <li>• authorized the Department of Revenue to return a driver's license if it determined the license was erroneously canceled.</li> </ul>	
<b>Interim Session 2003</b>			
Bill A	Prevention of Spilling of Material from Vehicles	Bill A would have increased the penalty for the violation of illegally spilling material from a vehicle.	
Bill B	Abandoned Motor Vehicles at Motor Vehicle Repair Shops	Bill B would have established a process governing how a motor vehicle repair shop handles abandoned motor vehicles valued at \$2,000 or less.	
Bill C	Driver's License Fee Distribution	Bill C would have changed the distribution amounts allotted to counties and to the state from driver's license fees.	
Bill H	Motor Vehicle Open Container	Bill H would have made it a Class A traffic infraction for a person to knowingly possess or drink an open alcoholic beverage in the passenger area of a motor vehicle.	
Bill K	Safety Belt Violations Fines	Bill K would have raised the fine for driving without a safety belt or for failing to use an appropriate child restraint; required the Colorado Department of Transportation (CDOT) to expend additional collected moneys on programs that encourage the use of motor vehicle safety belts and appropriate child restraints; and required CDOT to annually report expenditures to the Joint Budget Committee.	



**Colorado  
Legislative  
Council  
Staff**

Room 029 State Capitol, Denver, CO 80203-1784  
(303) 866-3521 • FAX: 866-3855 • TDD: 866-3472  
[www.colorado.gov/lcs](http://www.colorado.gov/lcs)  
E-mail: [lcs.ga@state.co.us](mailto:lcs.ga@state.co.us)

---

**MEMORANDUM**

July 16, 2013

**TO:** Members of the Transportation Legislation Review Committee  
**FROM:** Jonathan Senft, Fiscal Analyst, 303-866-3523  
**SUBJECT:** Colorado State and Local Transportation Funding

**Summary**

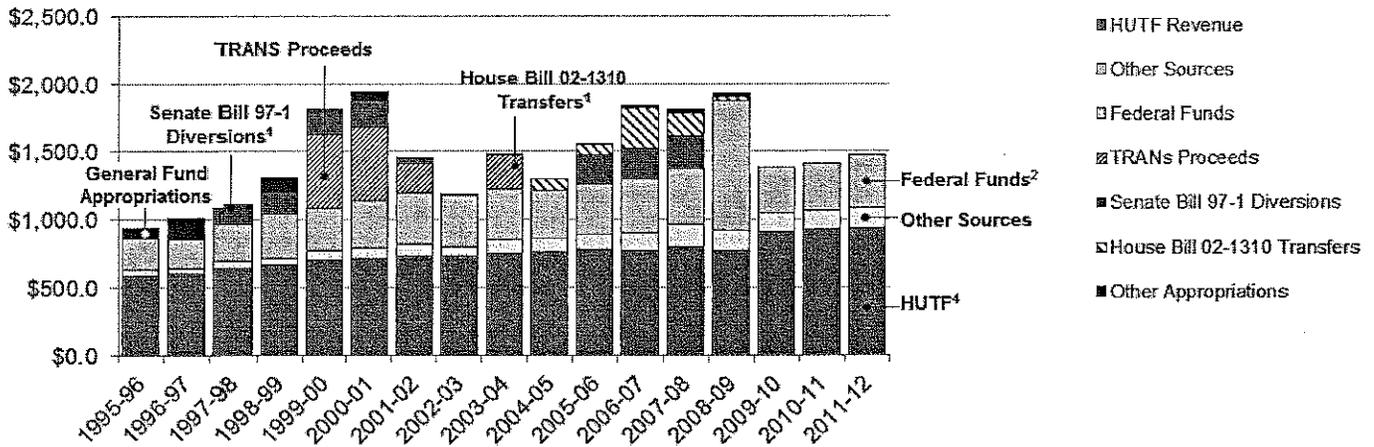
This memorandum provides information about major revenue sources that the state and local governments use to fund Colorado's transportation infrastructure and related programs. Revenue to the state includes motor fuel taxes, registration fees, as well as monies from the Aviation Fund, federal funds, and, on occasion, the state's General Fund. Local governments also contribute to transportation funding through ridership fares, user tolls, sales and use taxes, and lodging taxes.

**State Transportation Funding**

The Colorado Constitution requires that all registrations, fees, and fines charged with respect to the operation of a motor vehicle on Colorado's public highways and any motor fuel taxes be used for the construction, maintenance, and supervision of the state's highways. The recently passed Senate Bill 13-048 added that this revenue can also be used on transit-related projects. Under these constitutional limitations, the General Assembly, in cooperation with transportation stakeholders, may determine the sources of transportation revenue and the distribution of this revenue for statewide and local programs.

Figure 1 shows a 15-year history of the major state sources of funding for Colorado's transportation system. In FY 2011-12, the state received \$1.4 billion in total transportation revenue, including federal funds. As summary of each funding source follows.

**Figure 1  
Major Funding Sources for the Colorado Transportation System**



Source: Office of the State Controller and Colorado Department of Transportation.

\*Actual Totals.

Note: Funding sources exclude revenue to regional transit authorities and local governments. Tolling revenues and smaller sources of revenue are also excluded.

<sup>1</sup>Senate Bill 97-001 diversions and House Bill 02-1310 transfers were repealed in 2009.

<sup>2</sup>Federal funds include \$404.2 million in American Recovery and Reinvestment Act (ARRA) funds in FY 2008-09, which are now exhausted.

<sup>3</sup>FASTER revenue includes the road safety surcharge, the daily rental car fee, the late registration fee, the bridge safety surcharge, and the overweight vehicle supplemental fee. The revenue collected from this bill is shown as HUTF revenue.

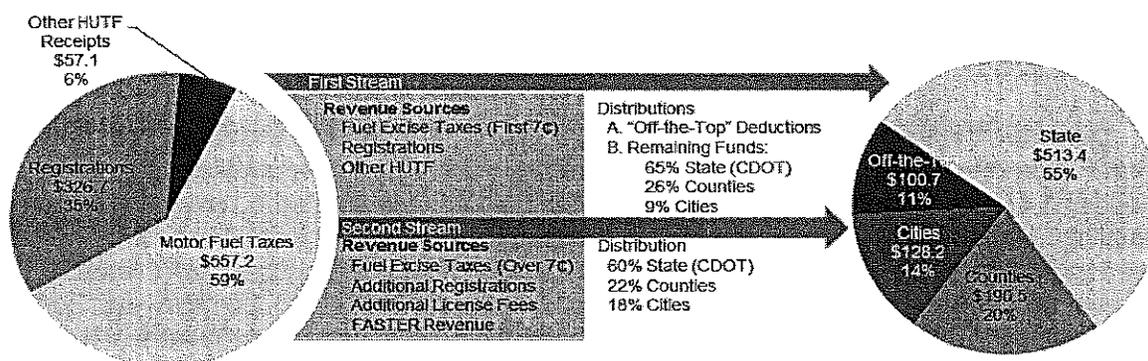
<sup>4</sup>HUTF revenue includes the state distribution of revenue from fuel taxes, motor vehicle registrations, and other fees.

**Highway Users Tax Fund.** The state Highway Users Tax Fund (HUTF) is the primary source of highway funds in Colorado. Revenue to the fund totaled \$941.1 million in FY 2011-12. Revenue to the HUTF comes from the following sources:

- Motor fuel taxes. State motor fuel excise taxes make up the largest share of HUTF revenue. Excise fuel taxes are levied on a per-gallon basis at 22 cents per gallon for gasoline and 20.5 cents per gallon for diesel fuel. In FY 2011-12, motor fuel and special fuel tax revenue totaled an estimated \$557.2 million.
- Registration fees. Motor vehicle registration fees make up the second largest source of HUTF revenue. Registration fees are based on the age and weight of the vehicle registered. Notably, registration fees differ from the specific ownership tax, which are apportioned to local governments in a manner similar to property taxes. Registration fees include the apportionment of interstate motor carrier fee revenue under the International Registration Plan (IRP), a reciprocal agreement among states for registration of motor carrier trucks that travel across state lines. In FY 2011-12, registration fee revenue totaled an estimated \$326.7 million.
- Other HUTF receipts. Remaining HUTF revenue comes from driver's license fees, court fines, and interest earnings. In FY 2011-12, revenue from these sources totaled \$57.1 million.

HUTF funds are allocated to the state highway fund, counties, and cities based on statutory formulas.<sup>1</sup> Figure 2 shows both the source of revenue to the HUTF and the distribution of moneys from the fund. The terms "first stream" and "second stream" are commonly used when explaining the distribution of revenue from the HUTF. In the "first stream," before anything is distributed, appropriations are made to the Department of Revenue and the State Patrol in the Department of Public Safety for highway-related functions. These appropriations are referred to as "off-the-top" deductions. Remaining revenue is distributed to Colorado Department of Transportation (CDOT) (65 percent), counties (26 percent), and cities (9 percent). Revenue to the "second stream" is distributed directly to CDOT (60 percent), counties (22 percent), and cities (18 percent).

**Figure 2**  
**Highway Users Tax Fund (HUTF) Revenue and Distributions, FY 2011-12**



Data Source: Office of the State Controller and Office of the State Treasurer.

**State Highway Fund revenue.** The State Highway Fund is administered by CDOT and is primarily used for the maintenance of the state's highway system. The state's share of HUTF distributions and federal funds are deposited and managed in this fund. The fund also generates its own revenue from interest earnings on the fund balance, local government matching funds to federal transportation funding programs, and a handful of small miscellaneous sources. In FY 2011-12, \$56.1 million in revenue from these sources was credited to the fund.

**Other sources of transportation revenue.** Smaller sources of state transportation revenue include the aviation tax and a number of registration and highway safety-related fees and fines. These sources of revenue include:

- **Aviation Fund revenue.** Aviation Fund revenue includes revenue from a 6 cent per gallon fuel excise tax on fuel used by smaller propeller-driven aircraft, a 4 cent per gallon jet fuel tax, and a 2.9 percent sales tax on the retail cost of jet fuel. Commercial airlines are exempt from paying the 4 and 6 cent tax, but not exempt from sales tax. Over 80 percent of the revenue from these taxes comes from the activity at Denver International Airport, with local municipal airports comprising the remaining revenue. Aviation Fund revenue is shared between the local governments that own and operate the airports and CDOT. Local governments use the aviation fuel tax revenue to maintain and operate local airports. CDOT uses this revenue to provide discretionary grants to airports and to fund the operation of the CDOT Aeronautics Division. In FY 2011-12, \$41.0 million in revenue was credited to the state Aviation Fund.

<sup>1</sup>Sections 43-4-205, 43-4-206, 43-4-207, and 43-4-208, C.R.S.

- *Highway safety revenue.* Transportation revenue also comes from statutory fees charged for the Law Enforcement Assistance Fund (LEAF), and fines for driving under the influence (DUI) or driving while ability impaired (DWAI). Revenue from these sources is generally used to fund traffic signals, and safety campaigns such as the "Click it or Ticket" and the "Heat is On." Revenue from these sources is shared with the Judicial Branch, the Department of Public Health and Environment (to pay the costs of laboratory services and implied consent specialists for DUI analysis), and the Department of Revenue, Division of Motor Vehicles. Revenue from these fines and fees totaled \$10.9 million in FY 2011-12.
- *Other registration fees.* A number of additional registration fees are assessed when a motor vehicle is registered with the state. These fees include: emergency medical services fees, emissions registration and inspection fees, motorcycle and motor vehicle license fees, and Police Officer Standards and Training (P.O.S.T.) Board fees. Revenue from these fines and fees totaled \$62.2 million in FY 2011-12.

**General Fund revenue.** Over the last 15 years, the General Assembly has allocated General Fund revenue for transportation purposes by authorizing appropriations, transfers, and diversions. Legislation passed in 2009, Senate Bill 09-228, established a new mechanism for transferring General Fund money to the HUTF. Under the new mechanism for transfers, the HUTF receives a five-year block of transfers, with each annual transfer equaling 2 percent of total General Fund revenue collected in that fiscal year. Under Senate Bill 09-228, the five-year block of transfers would be triggered in FY 2013-14, if Colorado personal income grew by at least 5 percent in 2012.

Based on the June 2013 Legislative Council Staff forecast, Colorado personal income is expected to increase by 5 percent in 2013, triggering the first year of these transfers in FY 2014-15. The Highway Users Tax Fund will receive an estimated \$189.7 million, or 2 percent of General Fund revenue. These transfers will occur for five years unless the state incurs a large enough TABOR surplus. If, during any particular year, the state incurs a TABOR surplus equal to between 1 percent (\$94.8 million in FY 2014-15) and 3 percent (\$284.5 million in FY 2014-15) of General Fund revenue, state law requires these transfers to be cut in half. During any year in which the TABOR surplus is greater than 3 percent of General Fund revenue, these transfers will be eliminated. Transfers to the HUTF remain at 2 percent of General Fund revenue for the full five years.

**Federal funds.** Congress authorizes the expenditure of federal funds by state and local governments through multi-year transportation funding acts. MAP-21 is the most recent authorization and remains the current statutory framework governing federal transportation law and spending. MAP-21 sustains current funding levels for two fiscal years, and is slated to expire in late 2014. Funding for the current authorization is reliant on federal General Fund dollars, which continue to prop up the federal Highway Trust Fund. MAP-21 also had provisions for continuation of the Federal Gas Tax – (\$18.4 cents per gallon) for four more years. Congress plans to begin work on the reauthorization of MAP-21 during the second half of 2013.

Federal funds are distributed from the federal Highway Trust Fund, which collects motor fuel taxes and truck-related taxes (truck and trailer sales, truck tires, and heavy-vehicle use) and redistributes them to the states based on formulas specified in federal law. Federal funds received by CDOT were approximately \$552.6 million in FY 2011-12, and \$487.0 million in FY 2012-13.

**Transportation Revenue Anticipation Notes (TRANS).** In 1999, Colorado voters authorized CDOT to borrow up to \$1.7 billion by selling Transportation Revenue Anticipation Notes (TRANS) with a maximum repayment cost of \$2.3 billion. Debt service on TRANS is paid with

money from the federal government and state matching funds. TRANs proceeds were exempt from the TABOR revenue limit and could be used only for a list of 28 prioritized statewide projects, referred to as the "seventh pot." In effect, the use of TRANs allowed CDOT to accelerate construction on the seventh pot projects by pre-spending payments from the federal government. CDOT has issued a total of \$1.5 billion in five installments during 2000 through 2004, with a total repayment cost of \$2.3 billion. CDOT will be paying debt service of approximately \$168 million each year through FY 2016-17. TRANs revenue was spent on a number of state highway projects, including the expansion of I-25. This program was refinanced in January 2013, although the payment terms of the refinancing have not yet been updated.

***TABOR-exempt transportation revenue.*** TABOR allows a program that operates similar to a private business to be exempt from the TABOR limit if it meets certain conditions. These programs are referred to as "enterprises" for the purposes of TABOR. Two enterprises operate under CDOT. These government-owned businesses have authority to issue revenue bonds and must receive less than 10 percent of their revenue from state and local government sources or they will lose their enterprise status.<sup>2</sup> These enterprises are as follows:

- *Statewide Bridge Enterprise.* Senate Bill 09-108 (FASTER) created the Statewide Bridge Enterprise, and appointed the Transportation Commission to serve as the Bridge Enterprise Board of Directors.<sup>3</sup> The Statewide Bridge Enterprise was created to "finance, repair, reconstruct, and replace any designated bridge in the state."<sup>4</sup> FASTER also created a new TABOR-exempt revenue source, the bridge safety surcharge, to fund bridge projects. In FY 2011-12, the bridge safety surcharge generated \$101.5 million in revenue.
- *High-Performance Transportation Enterprise.* Senate Bill 09-108 replaced the Colorado Tolling Enterprise (CTE), which was created in 2002 as a result of House Bill 02-1310, with the High-Performance Transportation Enterprise (HPTE). HPTE was formed for the purpose of efficiently financing surface transportation infrastructure projects that will improve the safety, capacity, and accessibility of the surface transportation system. To date, revenue received by the HPTE/CTE has been solely from the I-25 Express Toll lanes and interest earnings on a loan granted from the Transportation Commission to the CTE for initial startup costs. In FY 2012-13, this revenue totaled \$4.0 million.

## Local Government Transportation Funding

In addition to state-funded projects, local governments — including Colorado cities, counties, special districts, and authorities — provide funding independently for the construction, operation, and maintenance of roads and transit within their borders. In addition to the HUTF distribution, funding for local government transportation projects comes from a number of different sources, including the following:

- ridership fares and user tolls;
- private and nonprofit partnerships;

---

<sup>2</sup>Article X, Section 20, Colorado Constitution.

<sup>3</sup>The Transportation Commission is charged by Colorado law with formulating general policy with respect to the management, construction, and maintenance of public highways and other state transportation systems. The commission is comprised of 11 commissioners who represent specific districts. These individuals are appointed by the Governor and confirmed by the state Senate.

<sup>4</sup>Section 43-4-805, C.R.S.

- dedicated sales and use tax revenue;
- dedicated lodging tax revenue;
- local government general fund revenue; and
- federal funds, including federal matching funds.

Table 1 provides examples of some of the different types of transportation funding sources for selected local governments.

**Table 1**  
**Selected Local Government Transportation Funding Sources**

Local Government Type	Local Government	Funding Source
City	City of Aspen	0.5% lodging tax (one quarter of the revenue goes to the Local Transit Services and three quarters goes toward local tourism promotion)
County	Larimer County	Combination of: <ul style="list-style-type: none"> <li>• Highway Users Tax Fund</li> <li>• Federal payment in lieu of taxes (PILT) funds from Rocky Mountain National Park</li> <li>• Specific ownership tax (SOT)</li> <li>• Property taxes</li> </ul>
Mass Transit District	Eagle County	0.5% sales tax rate
	Summit County	0.75% sales tax rate
	Pitkin County	0.5% sales and use tax rate
Local Improvement District	Jefferson County Southeast Local Improvement District	0.5% sales tax

Source: Colorado Department of Revenue, City of Aspen, and Larimer County.

**Regional transportation authorities.** Colorado law allows municipalities and counties, with voter approval, to form a regional transportation authority (RTA).<sup>5</sup> An RTA is a taxing authority authorized to make improvements to transportation infrastructure and provide transportation services within its geographic boundaries. With voter approval, an RTA may collect revenue by doing the following:

- charging a toll;<sup>6</sup>
- levying a sales and use tax of up to 1 percent;<sup>7</sup>
- charging a local motor vehicle registration fee of up to \$10;<sup>8</sup> and
- levying a lodging taxes of up to 2 percent.<sup>9</sup>

<sup>5</sup>Section 43-4-601, *et. seq.*, C.R.S.

<sup>6</sup>Section 43-4-605 (1)(d), C.R.S.

<sup>7</sup>Section 43-4-605 (1)(j), C.R.S.

<sup>8</sup>Section 43-4-605 (1)(i), C.R.S

<sup>9</sup>Section 43-4-605 (1)(i), C.R.S

Table 2 summarizes the five RTAs in Colorado, member municipalities, and their respective sale and use tax rates.

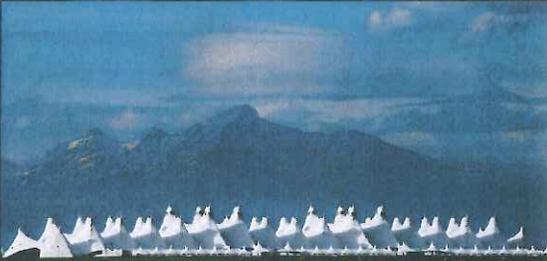
**Table 2**  
**Regional Transportation Authority Sales and Use Tax Rates**

Regional Transportation Authority	Member Municipalities	Sales and Use Tax Rate
Roaring Fork Transportation Authority	Cities of Basalt and New Castle	0.8%
	Cities of Carbondale and Glenwood Springs	1.0%
	Areas of unincorporated Eagle County in the El Jebel area and outside the city limits of Carbondale	0.6%
	City of Aspen, Snowmass Village, and unincorporated Pitkin County	0.4%
Pikes Peak Rural Transportation Authority	El Paso County except the municipalities of Calhan, Fountain, Monument, and Palmer Lake	1.0%
Gunnison Valley Rural Transportation Authority	All of Gunnison County except the municipalities of Marble, Ohio, Pitkin, and Somerset	0.6%*
	City of Gunnison	0.35%*
South Platte Valley Regional Transportation Authority	City of Sterling	0.1%
Baptist Road Rural Transportation Authority	City of Monument	1.0%

Source: Colorado Department of Revenue.

\*Sales tax only.

7/15/2013



**DIA TODAY**

 **Kim Day**  
Manager of Aviation  
July 16, 2013



---

---

---

---

---

---

---

---



**DIA's Economic Impact**

- \$22 billion annual for region
- Supports more than 270,000 jobs
- Over \$7 billion in annual payroll



---

---

---

---

---

---

---

---



**Passenger Traffic**

- 27% LOCALS
- 27% VISITORS
- 46% TRANSFERS

- 53 million in 2012
- 5<sup>th</sup> busiest airport in the U.S.
- 13<sup>th</sup> busiest airport in the world



---

---

---

---

---

---

---

---



lounge 5280

Rivol

Shopping and Dining at DIA

- 147 locations
- 2900+ employees
- \$270 million gross revenues
- \$19 million +/- annual city sales tax

DENVER INTERNATIONAL AIRPORT

---

---

---

---

---

---

---

---



ELWAY'S

New Shopping and Dining Options

- Elway's, Udi's, ExresSpa, Vino Volo, CRU, Tuleh Ruche, Wendy's
- Coming Soon: Dunkin' Donuts, Root Down

DENVER INTERNATIONAL AIRPORT

---

---

---

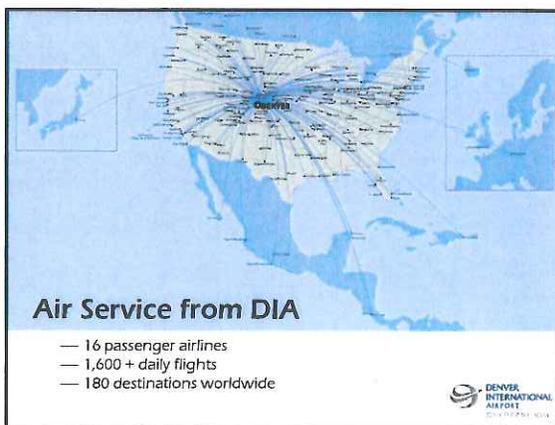
---

---

---

---

---



Air Service from DIA

- 16 passenger airlines
- 1,600 + daily flights
- 180 destinations worldwide

DENVER INTERNATIONAL AIRPORT

---

---

---

---

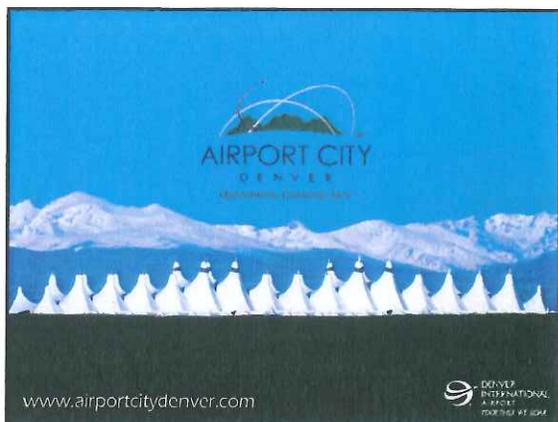
---

---

---

---





---

---

---

---

---

---

---

---

AIRPORT CITY  
DENVER  
Opportunity Connects Here

- 25,000+ construction jobs
- 30,000+ workers
- 40,000+ new jobs in region
- \$300 million+ in combined tax revenue

**Regional Economic Benefit: First 20 Years**

DENVER INTERNATIONAL AIRPORT  
FOOTER #1 2014

---

---

---

---

---

---

---

---

**South Terminal Redevelopment Program**

- 519-room Westin hotel and conference center
- RTD east rail line station

DENVER INTERNATIONAL AIRPORT  
FOOTER #1 2014

---

---

---

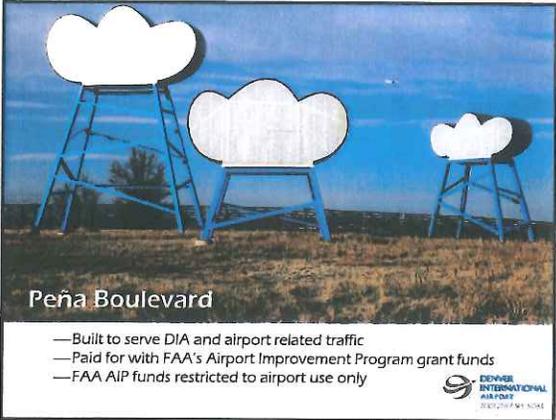
---

---

---

---

---




---

---

---

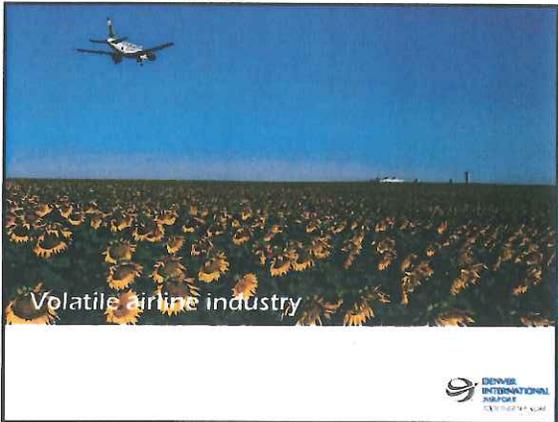
---

---

---

---

---




---

---

---

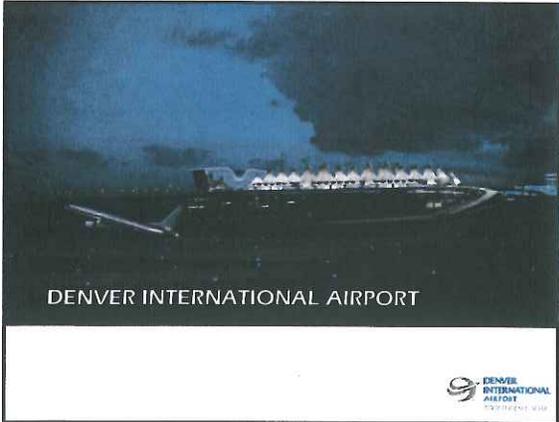
---

---

---

---

---




---

---

---

---

---

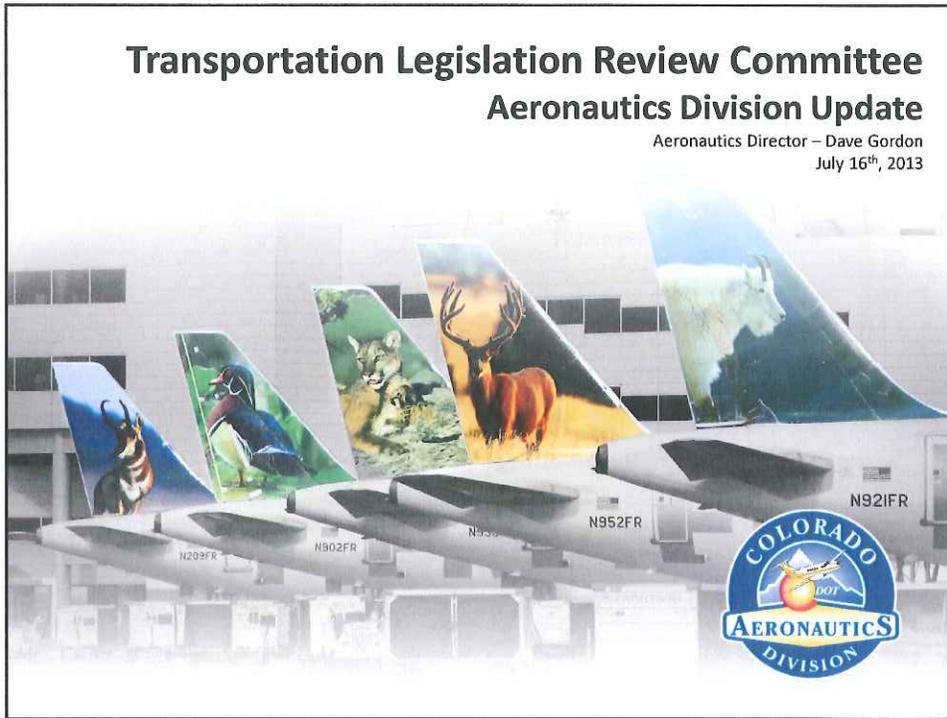
---

---

---

## Transportation Legislation Review Committee Aeronautics Division Update

Aeronautics Director – Dave Gordon  
July 16<sup>th</sup>, 2013

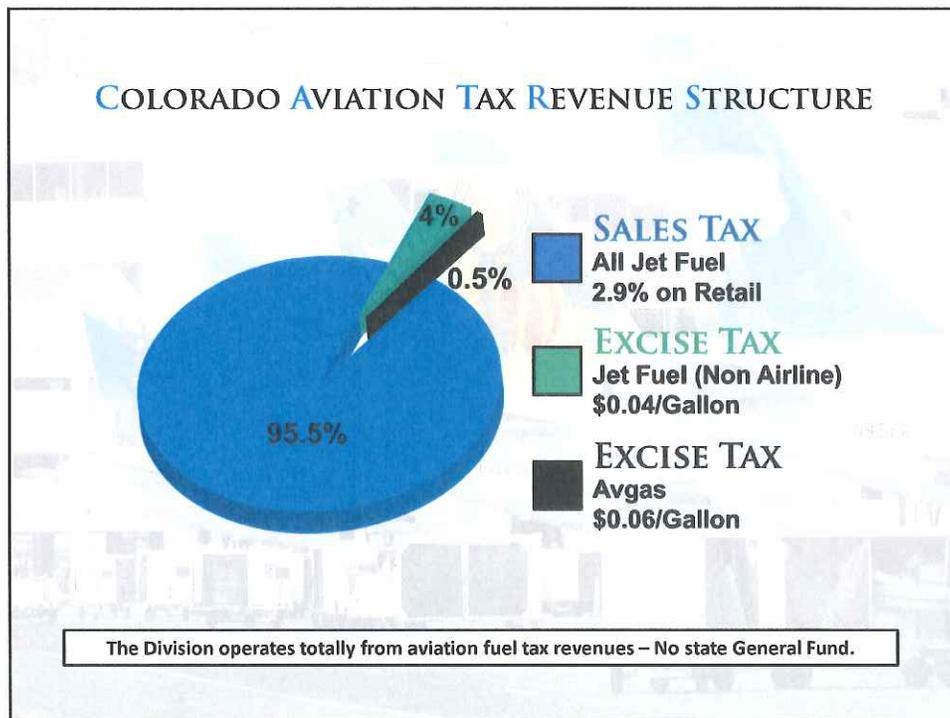
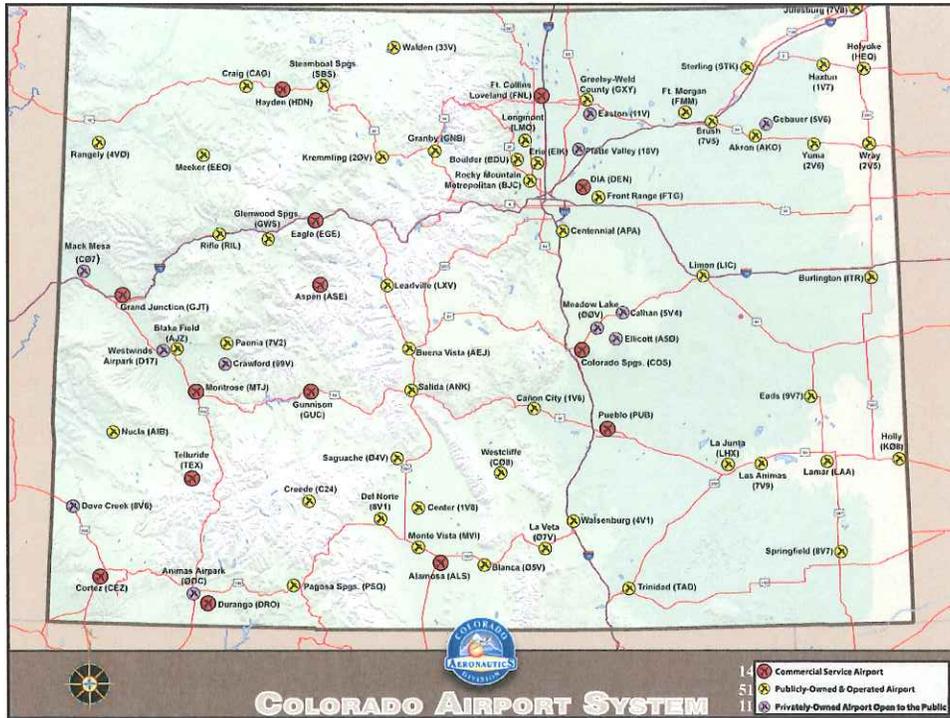


COLORADO DEPARTMENT OF TRANSPORTATION

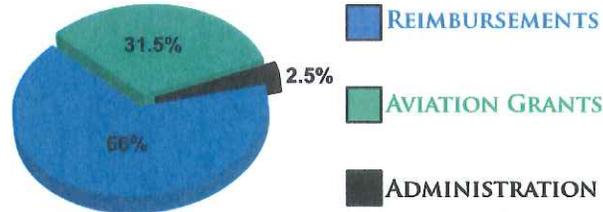
### MISSION STATEMENT

In support of the Colorado Department of Transportation's development of a forward-looking multi-modal transportation system in the 21st century, the Colorado Division of Aeronautics shall promote partnering with its public and private constituents to enhance aviation safety, aviation education, and the development of an effective air transportation system through the efficient administration of the Colorado Aviation Fund.





### COLORADO AVIATION TAX EXPENDITURES



Number of Projects Funded (1992-2012)	Project Type
388	Federal Match
256	Runway/Taxiway/Ramp Pavement Maintenance
74	Equipment (snow removal, fire fighting, etc.)
62	Planning/Land Purchase
59	Navaid/Safety
38	Fencing/Airport Security
28	Compliance

### FY 2013 Colorado Discretionary Aviation Grant Summary

- Awarded a total of 44 Aviation Grants.
- **TOTAL CDAG FUNDS AWARDED: \$20.7 Million.**

Total Funding Summary - FY 2012			
CDAG	Local Match	Federal	TOTAL Project Costs
<b>\$20,679,280</b>	\$11,866,791	\$41,259,279	\$73,805,350

Source: [http://www.coloradodot.info/programs/aeronautics/PDF\\_Files/GrantReports/2013\\_CDAG\\_Awards.pdf](http://www.coloradodot.info/programs/aeronautics/PDF_Files/GrantReports/2013_CDAG_Awards.pdf)



### CDAG Project Examples



**Denver International Airport**  
Pena Boulevard Rehabilitation

Federal	CDAG	Local
\$0	\$3,000,000	\$7,357,746



**Colorado Plains Regional Airport**

Participate in federally-funded ramp repair, taxiway maintenance, and perimeter fencing project

Federal	CDAG	Local
\$450,000	\$25,000	\$25,000



**Meeker Airport**

Construct large aircraft apron area. Participate in federally-funded pavement maintenance of existing aircraft apron area.

Federal	CDAG	Local
\$150,000	\$2,654,513	\$302,353

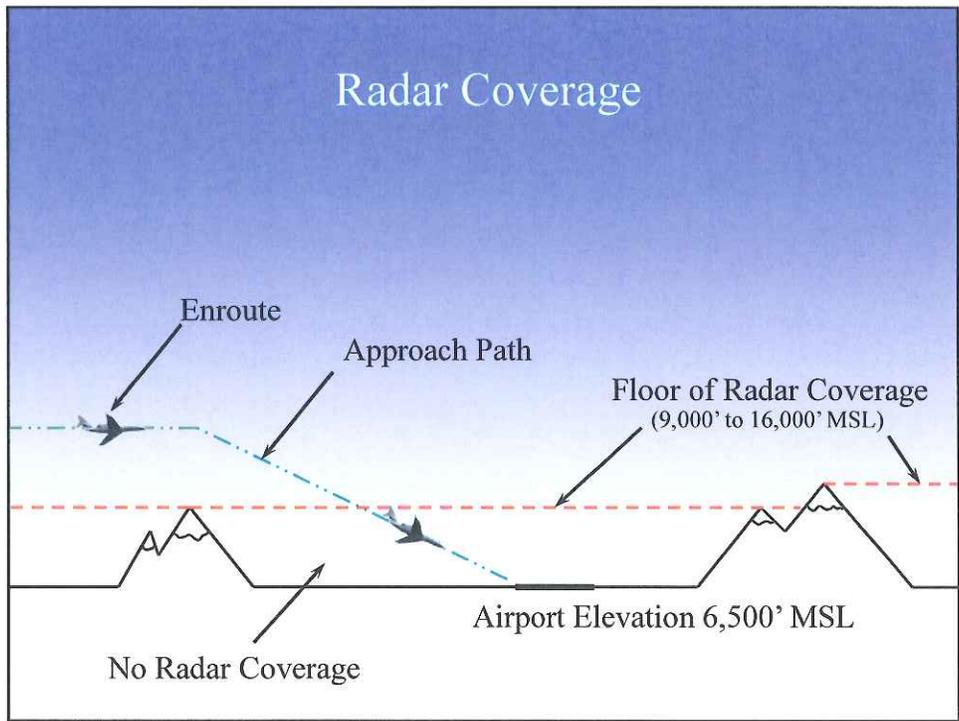
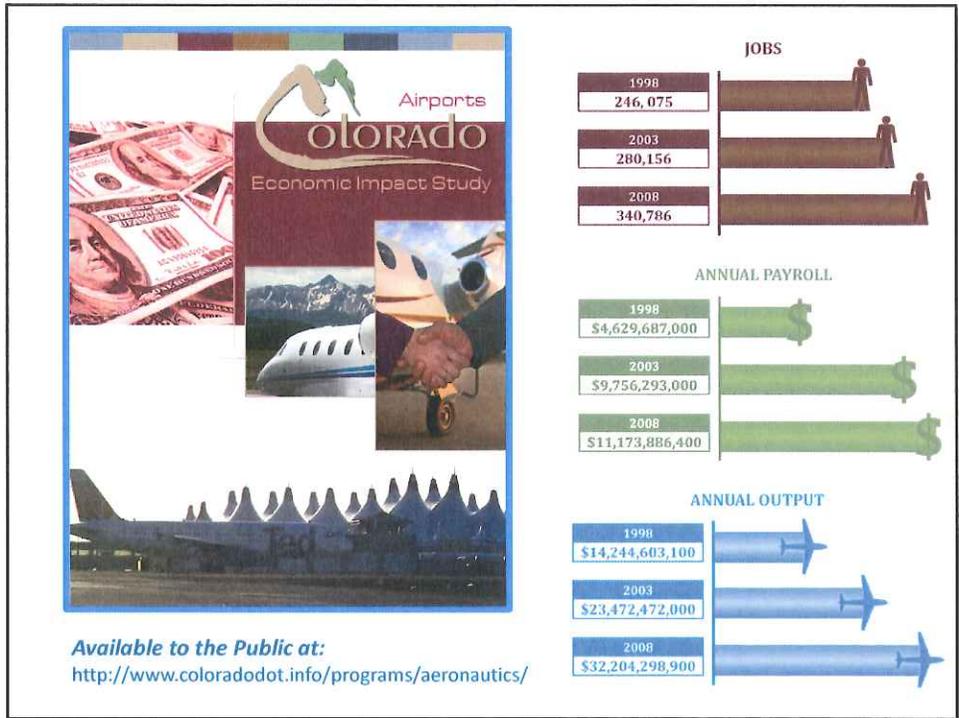


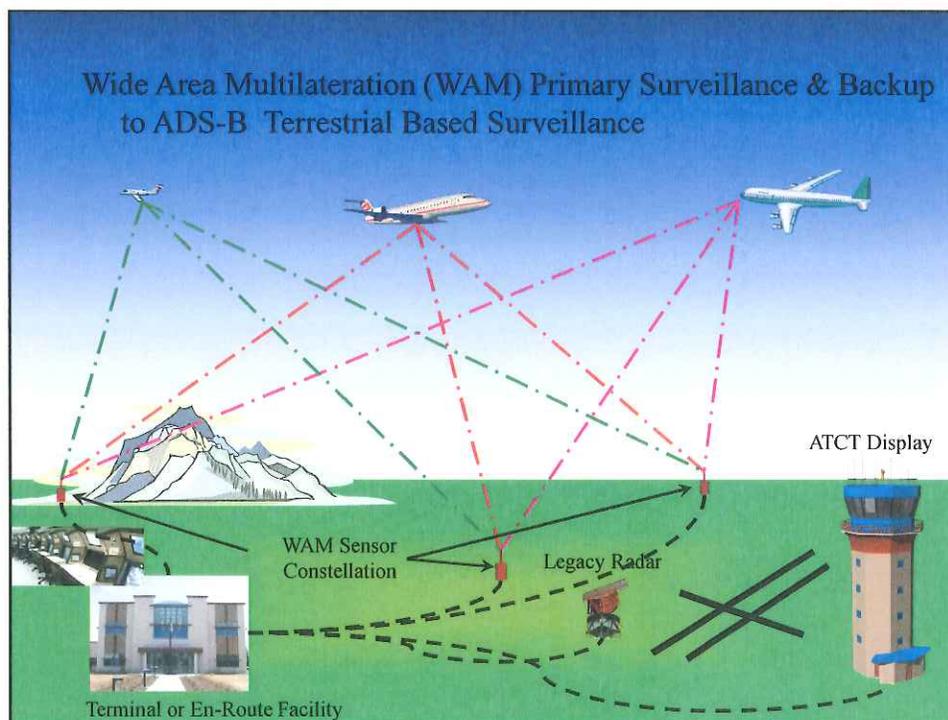
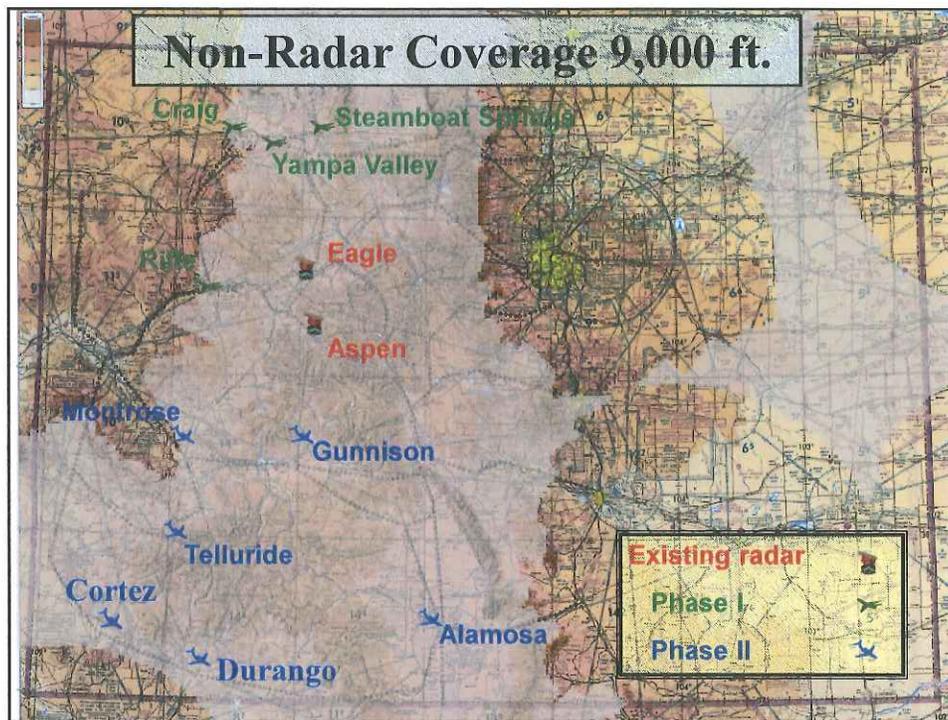
COLORADO DEPARTMENT OF TRANSPORTATION

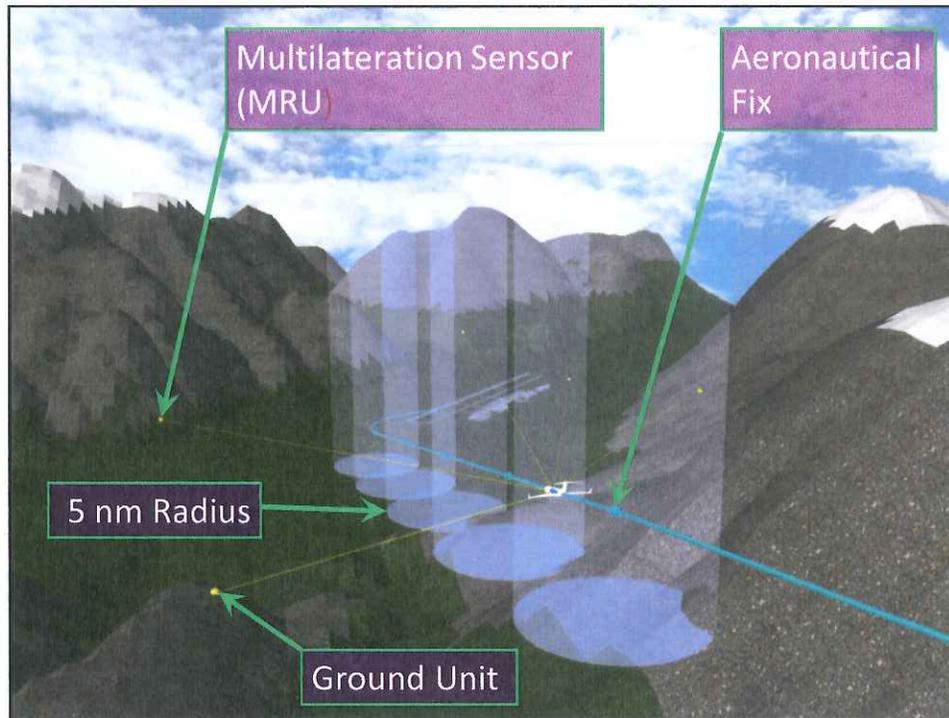
### SPECIAL PROJECTS

- Division of Aeronautics Airport Directory
- Economic Impact Update Study
- State-wide System Plan
- Mountain Pass Weather Stations - AWOS
- Mountain Radar Surveillance Project – Phase III



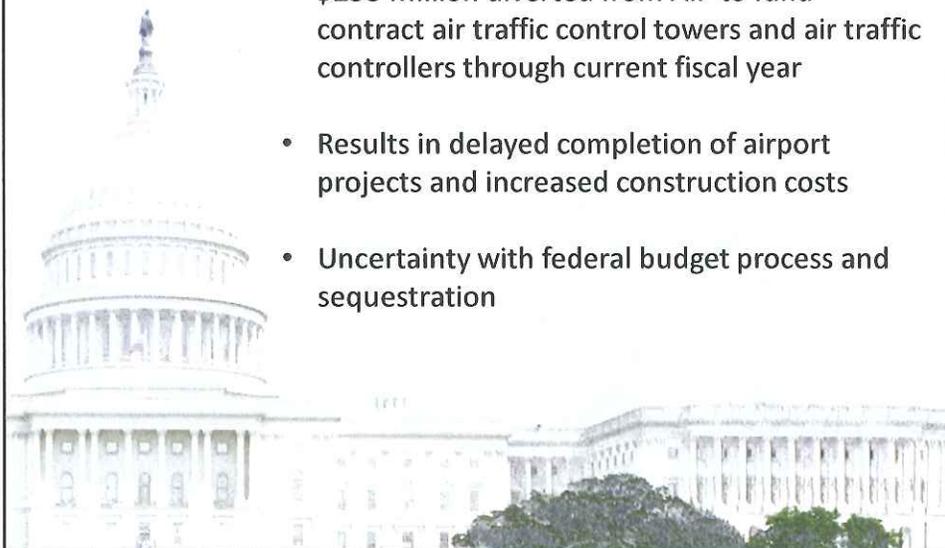




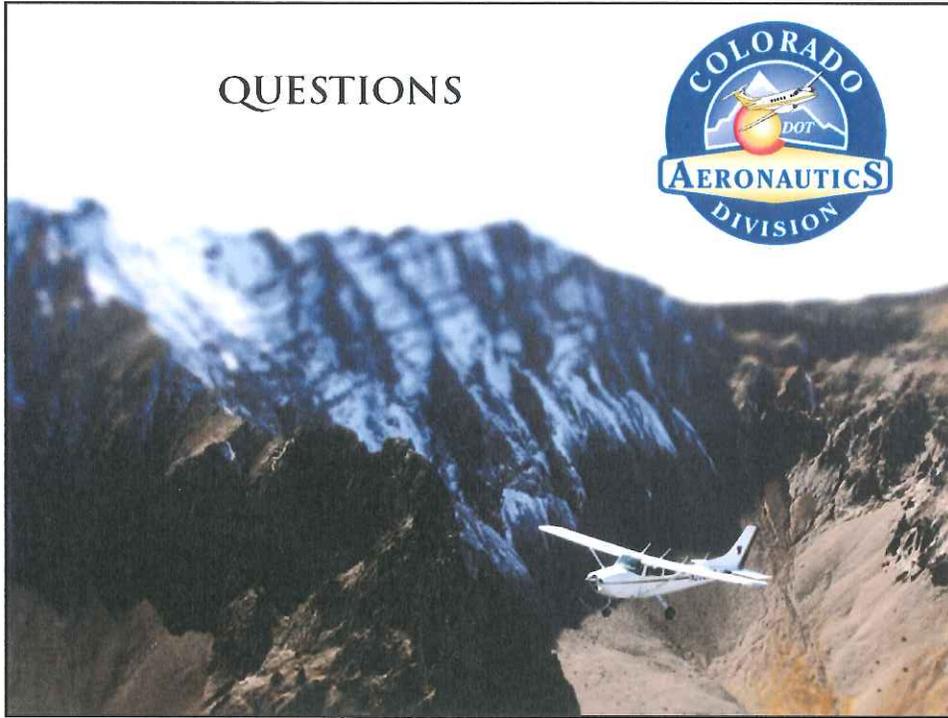


## IMPACTS OF FEDERAL SEQUESTRATION ON AVIATION

- \$253 Million diverted from AIP to fund contract air traffic control towers and air traffic controllers through current fiscal year
- Results in delayed completion of airport projects and increased construction costs
- Uncertainty with federal budget process and sequestration



# QUESTIONS



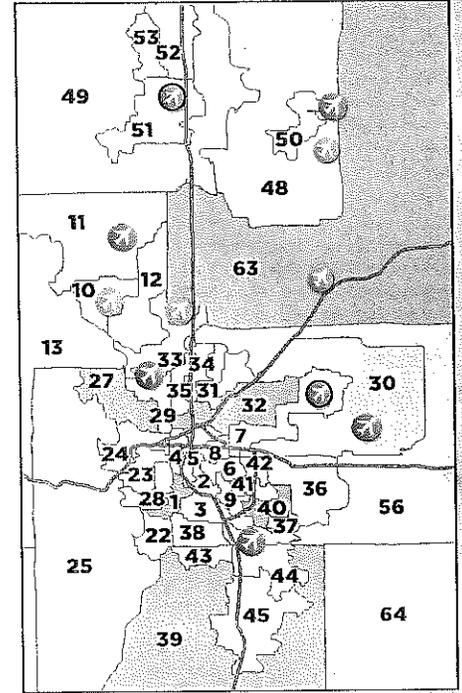
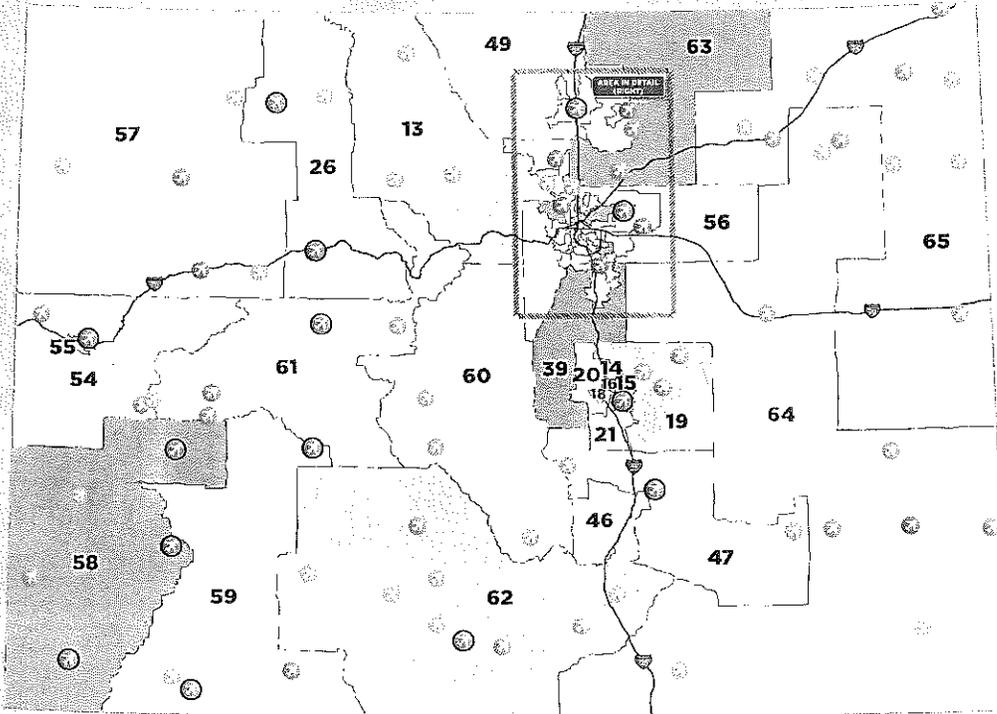


# Colorado

## 2013 LEGISLATIVE DISTRICTS & AIRPORT MAPS



# 2013 HOUSE DISTRICTS & AIRPORTS

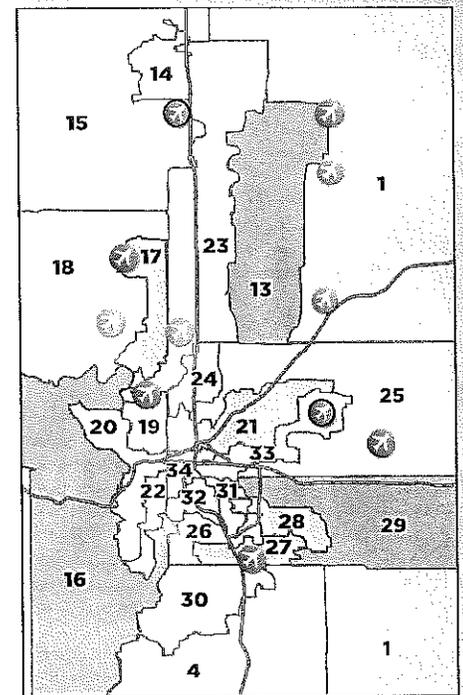
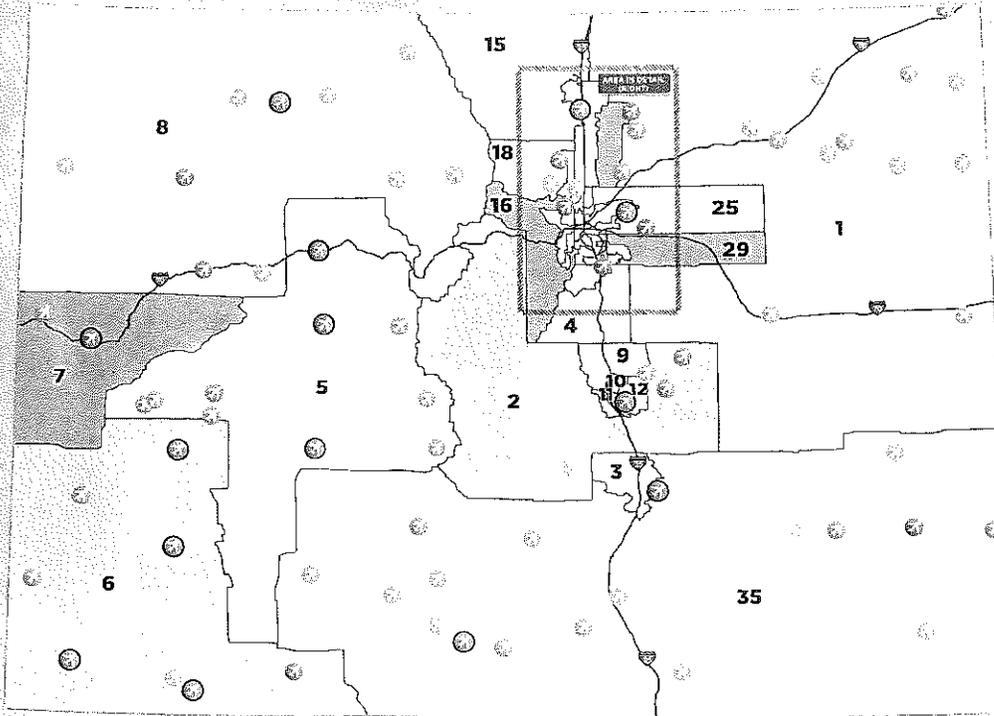


DISTRICT	NAME	AIRPORT(S)
1	Labuda, Jeanne (D)	
2	Ferrandino, Mark (D)	
3	Kagan, Daniel (D)	
4	Pabon, Dan (D)	
5	Duran, Crisanta (D)	
6	Court, Lois (D)	
7	Williams, Angela (D)	Denver International Airport
8	McCann, Elizabeth (D)	
9	Rosenthal, Paul (D)	
10	Hullingerhorst, Dickey Lee (D)	Boulder Municipal Airport
11	Singer, Jonathan (D)	Longmont-Vance Brand Municipal Airport
12	Foote, Mike (D)	
13	Levy, Claire (D)	Walden-Jackson County Airport Kremmling- McElroy Field Granby-Grand County Airport
14	Nordberg, Dan (R)	
15	Waller, Mark (R)	Colorado Springs Municipal Airport
16	Joshi, Janak (R)	
17	Exum, Thomas (D)	
18	Lee, Sanford E. (D)	
19	Stephens, Amy (R)	Meadow Lake Airport Ellicott-Springs East Airport Calhan Airport
20	Gardner, Bob (R)	
21	Landgraf, Lois (R)	
22	Everett, Justin (R)	
23	Tyler, Max (D)	
24	Schafer, Sue (D)	
25	Garou, Cheri (R)	
26	Mitsch Bush, Diane (D)	Hayden-Yampa Valley Regional Airport Steamboat Springs Municipal Airport Eagle County Regional Airport
27	Szabo, Libby (R)	
28	Petterson, Brittany (D)	
29	Kraft-Tharp, Tracy (D)	Rocky Mountain Metropolitan Airport
30	May, Jenise (D)	Front Range Airport
31	Salazar, Joseph A. (D)	
32	Moreno, Dominick (D)	
33	Primavera, Dianne (D)	
34	Lebsack, Steve (D)	
35	Peniston, Cherylin (D)	
36	Ryden, Su (D)	
37	Swalm, Spencer (R)	Centennial Airport
38	Conti, Kathleen (R)	
39	Lawrence, Polly (R)	
40	Buckner, John W. (D)	
41	Melton, Jovan (D)	
42	Fields, Rhonda (D)	
43	McNulty, Frank (R)	
44	Holbert, Chris (R)	Centennial Airport
45	Murray, Carole (R)	
46	Garcia, Leroy M. (D)	
47	Navarro, Clarice (R)	Pueblo Memorial Airport La Junta Municipal Airport Canon City-Fremont County Airport Greeley-Weld County Airport Easton-Valley View Airport
48	Humphrey, Stephen (R)	
49	Buck, Perry (R)	
50	Young, Dave (D)	
51	DelGrosso, Brian (R)	Ft. Collins-Loveland Municipal Airport
52	Ginal, Joann (D)	

LEGEND	Major Commercial Service Airport	Minor Airport
	Major General Aviation Airport	Intermediate Airport

DISTRICT	NAME	AIRPORT(S)
53	Fischer, Randy (D)	Mack Mesa Airport
54	Wright, Jared (R)	Westwinds Airpark
55	Scott, Ray (R)	Grand Junction Regional Airport
56	Priola, Kevin (R)	
57	Rankin, Bob (R)	Rifle-Garfield County Regional Airport Meeker Airport Glenwood Springs Municipal Airport Rangely Airport Craig-Moffat County Airport
58	Coram, Don (R)	Montrose Regional Airport Nucla Airport Telluride Regional Airport Cortez-Montezuma County Airport Dove Creek Airport
59	McLachlan, Mike (D)	Durango-La Plata County Airport Gunnison-Crested Butte Regional Airport Pagosa Springs-Stevens Field Animas Airpark
60	Wilson, James D. (R)	Central Colorado Regional Airport Salida-Harriet Alexander Airport Silver West Airport
61	Hamner, Millie (D)	Aspen-Pitkin County Airport Leadville-Lake County Airport Delta-Blake Field Paonia Airport Crawford Airport
62	Vigil, Edward (D)	Alamosa-San Luis Valley Regional Airport Monte Vista Municipal Airport Center-Leach Field Del Norte-Astronaut Kent Rominger Airport Saguache Municipal Airport Creede-Mineral County Airport Blanca Airport La Veta Airport Walsenburg-Spanish Peaks Airport
63	Saine, Lori (R)	Hudson-Platte Valley Airpark Erie Municipal Airport
64	Dore, Timothy (R)	Akron-Colorado Plains Regional Airport Gebauer Airport Limon Municipal Airport Eads Airport Lamar Municipal Airport Holly Airport Springfield Municipal Airport Las Animas-Bent County Airport Trinidad-Perry Stokes Airport Fort Morgan Municipal Airport
65	Sonnenberg, Jerry (R)	Brush Municipal Airport Sterling Municipal Airport Haxtun Municipal Airport Julesburg Municipal Airport Holyoke Municipal Airport Yuma Municipal Airport Wray Municipal Airport Burlington-Kit Carson County Airport

# 2013 SENATE DISTRICTS & AIRPORTS



**LEGEND**

- Major Commercial Service Airport
- Minor Airport
- Major General Aviation Airport
- Intermediate Airport

DISTRICT	NAME	AIRPORT(S)
1	Brophy, Greg (R)	Fort Morgan Municipal Airport Brush Municipal Airport Sterling Municipal Airport Haxtun Municipal Airport Julesburg Municipal Airport Holyoke Municipal Airport Yuma Municipal Airport Wray Municipal Airport Burlington-Kit Carson County Airport Akron-Colorado Plains Regional Airport Gebauer Airport Limon Municipal Airport Hudson-Platte Valley Airpark Easton-Valley View Airport
2	Grantham, Kevin (R)	Canon City-Fremont County Airport Ellis-Cott-Springs East Airport Calhan Airport
3	Giron, Angela (D)	Pueblo Memorial Airport
4	Scheffel, Mark (R)	
5	Schwartz, Gail (D)	Westwinds Airpark Aspen-Pitkin County Airport Leadville-Lake County Airport Delta-Blake Field Paonia Airport Crawford Airport Gunnison-Crested Butte Regional Airport Eagle County Regional Airport Central Colorado Regional Airport Salida-Harriet Alexander Airport
6	Roberts, Ellen S. (R)	Montrose Regional Airport Nucla Airport Telluride Regional Airport Cortez-Montezuma County Airport Dove Creek Airport Durango-La Plata County Airport Pagosa Springs-Stevens Field
7	King, Steve (R)	Animas Airpark Grand Junction Regional Airport Mack Mesa Airport
8	Baumgardner, Randy L. (R)	Rifle-Garfield County Regional Airport Meeker Airport Glenwood Springs Municipal Airport Rangely Airport Craig-Moffat County Airport Hayden-Yampa Valley Regional Airport Steamboat Springs Municipal Airport Walden-Jackson County Airport Kremmling-McElroy Field Granby-Grand County Airport
9	Lambert, Kent D. (R)	
10	Hill, Owen (R)	
11	Morse, John P. (D)	
12	Cadman, Bill (R)	Colorado Springs Municipal Airport Meadow Lake Airport

DISTRICT	NAME	AIRPORT(S)
13	Renfro, Scott W. (R)	Greeley-Weld County Airport
14	Kefalas, John (D)	
15	Lundberg, Kevin (R)	Ft. Collins-Loveland Municipal Airport
16	Nicholson, Jeane (D)	
17	Jones, Matt (D)	Longmont-Vance Brand Municipal Airport
18	Heath, Rolie (D)	Boulder Municipal Airport
19	Hudak, Evie (D)	Rocky Mountain Metropolitan Airport
20	Jahn, Cheri (D)	
21	Ulibarri, Jessie (D)	
22	Kerr, Andy (D)	
23	Marble, Vicki (R)	Erie Municipal Airport
24	Tochtrop, Lois (D)	
25	Hodge, Mary (D)	Front Range Airport
26	Newell, Linda (D)	
27	Balmer, David (R)	Centennial Airport
28	Todd, Nancy (D)	
29	Carrroll, Morgan (D)	
30	Harvey, Ted (R)	Centennial Airport
31	Steadman, Pat (D)	
32	Aguilar, Irene (D)	
33	Johnston, Michael (D)	Denver International Airport
34	Guzman, Lucia (D)	
35	Crowder, Larry (R)	La Junta Municipal Airport Silver West Airport Alamosa-San Luis Valley Regional Airport Monte Vista Municipal Airport Center-Leach Field Del Norte-Astronaut Kent Rominger Airport Saguache Municipal Airport Creede-Mineral County Airport Blanca Airport La Veta Airport Walsenburg-Spanish Peaks Airport Eads Airport Lamar Municipal Airport Holly Airport Springfield Municipal Airport Las Animas-Bent County Airport Trinidad-Perry Stokes Airport



Colorado Department of Transportation | Division of Aeronautics  
5126 Front Range Parkway | Watkins, Colorado 80137  
303.512.5250 | [www.colorado-aeronautics.org](http://www.colorado-aeronautics.org)



# COLORADO 2011 AVIATION SYSTEM PLAN



Photo by Sharon



## EXECUTIVE SUMMARY



# INTRODUCTION



Under the direction of the Colorado Department of Transportation (CDOT), Division of Aeronautics, Colorado was among the first states to prepare a performance-based aviation system plan. The plan helps to identify a system of airports and projects that meets the State's air transportation needs and supports its economic goals. The state aviation system plan also provides the Division of Aeronautics with an important planning tool to monitor how investment elevates overall system performance.

Building on the 2000 and 2005 state aviation system plans, the 2011 Colorado Aviation System Plan Update has three primary objectives:

- Use previously established performance measures and benchmarks to provide an update on how well the system is currently performing.
- Use information on system performance in 2000 and 2005 to identify 2011 changes in system performance.
- Use historic information to define the relationship between system performance measures, benchmarks, and facility/service objectives and aviation grants issued by the Division of Aeronautics.

The process to evaluate the airport system's performance results in a report card for the system. System performance measures are the categories in which the system is graded or evaluated, and individual benchmarks are the actual tests used to determine how well the system is performing. The system performance measures are commensurate with Federal Aviation Administration (FAA) descriptors for a balanced and viable airport system.

## Performance Measures



### Activity

The system should have sufficient capacity to meet current and future needs.



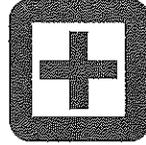
### Expansion Potential

The system should have the ability to respond to unforeseen changes in the aviation industry from a demand and technological standpoint or in the local market area.



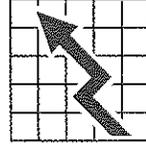
### Economic Support

The system should provide support to the economy.



### Coverage & Emergency Access

The system should be accessible for customers and users from both the ground and the air.



### Investment

The system should be developed to leverage historic investment and to make the most out of future investment.



### Security

The system should be operated to address security and safety considerations, relative to perceived risks.



# THE COLORADO AIRPORT SYSTEM

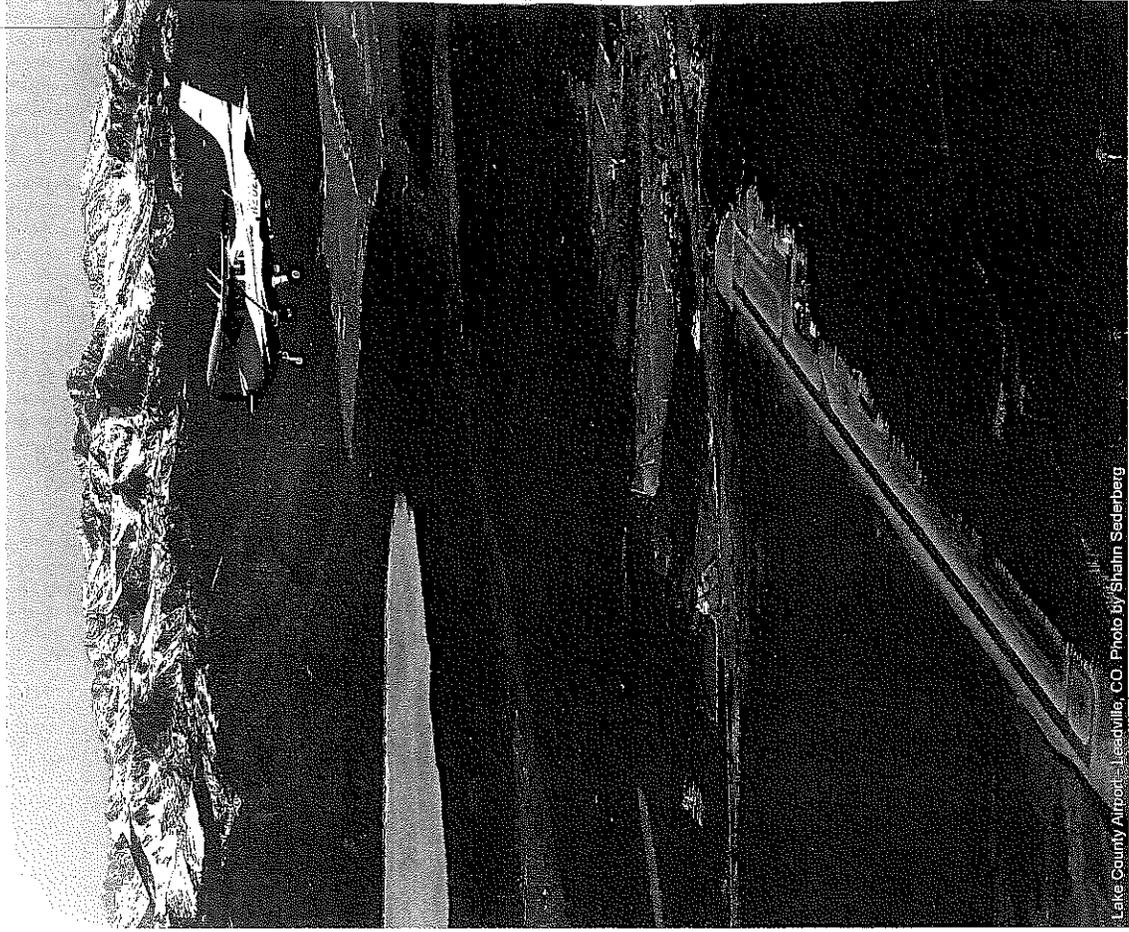
All airports in the Colorado system are assigned to one of three roles:

**A** Major, Intermediate, or Minor. Roles were initially assigned in 2000, but adjusted in 2005 and again in 2011 to reflect changes in the system and the aviation industry. Airport roles generally reflect the relative importance of the airport to the system and provide a backdrop for the system evaluation. As the system is evaluated, it is important to know which airports are privately versus publicly-owned and which airports are included in the National Plan of Integrated Airport Systems (NPIAS); Colorado airports included in the NPIAS are eligible for Federal funding from the FAA.

Using the framework established during this update to the Colorado Aviation System Plan, the plan shows how individual grants issued by the Division of Aeronautics relate to and help to support the broader measures that are used to evaluate and monitor the performance of Colorado's airport system. The system plan provides information on the following:

- ➔ **Actions and projects desirable to improve system performance relative to the plan's benchmarks.**
- ➔ **Actions and projects desirable to improve system performance relative to airport-specific facility, service, and equipment objectives.**
- ➔ **Generalized cost estimates related to implementing improvements identified in the update.**

The remainder of this document summarizes results from Colorado's 2011 Aviation System Plan Update.



Lake County Airport - Leadville, CO. Photo by Shahn Sederberg





# Performance Measure: ACTIVITY

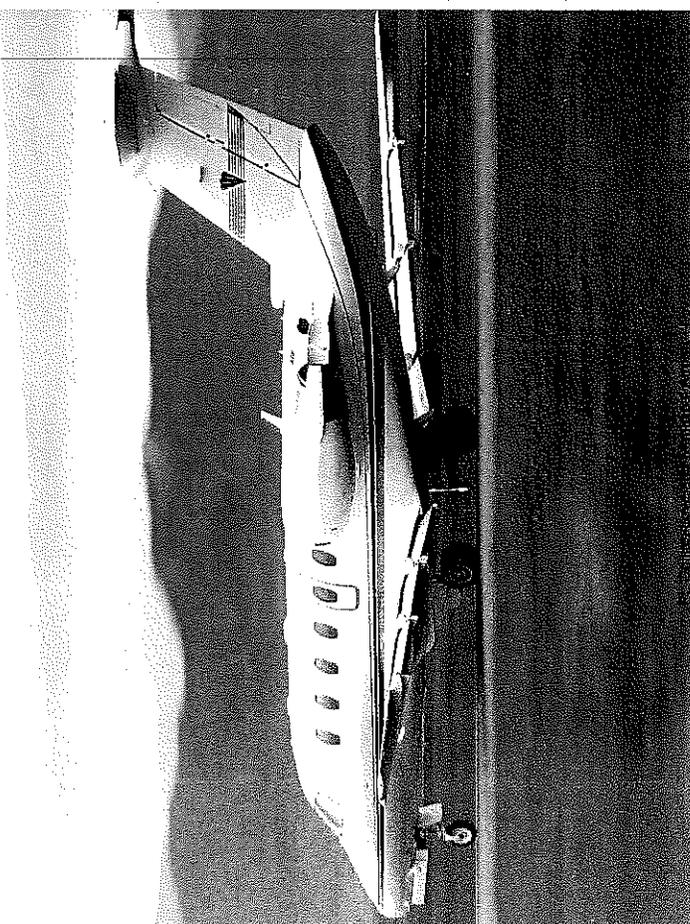


For airports in Colorado to effectively serve their customers, they should have adequate operational capacity. The system plan benchmarked the annual operational capacity of each airport to current and future total annual aircraft landings and takeoffs. This was accomplished using each airport's annual service volume (ASV). ASV reflects the ability of each airport's runway and taxiway system to accommodate annual operational demand; an ASV for each system airport was estimated using accepted FAA guidance. Projections of aviation demand were developed to support activity benchmarking. Activity recorded in 2005 and 2010 was a major building block to develop projections for various demand components. The critical component considered in the demand/capacity analysis was each airport's total annual operational estimate.

As information presented here indicates, while commercial aircraft operations at Denver International increased between 2005 and 2010, statewide operations in all other categories declined. In particular, Colorado experienced a decrease in general aviation operations. This was a national trend which was not specific to Colorado. At some non-towered airports, this reported decrease may have been a result of better estimates of activity and not actual declines in demand, but even at the system's largest general aviation airports that have air traffic control towers, decreases in general aviation demand were reported.

## Colorado Airport Demand Projections

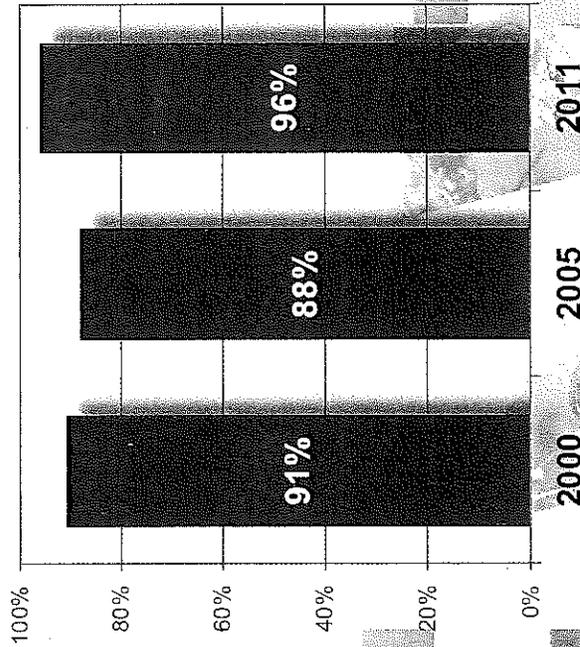
Enplanements	2005	2010	2015	2020	2030
Denver International	21,701,980	26,024,920	28,877,700	33,153,400	42,270,200
Other Commercial Airports	2,015,010	1,998,140	2,191,400	2,504,900	3,176,700
<b>Total</b>	<b>23,716,990</b>	<b>28,023,060</b>	<b>31,069,100</b>	<b>35,658,300</b>	<b>45,446,900</b>
<b>Commercial Operations</b>					
Denver International	527,160	608,060	654,730	730,000	880,600
Other Commercial Airports	95,250	83,680	88,650	95,860	110,970
<b>Total</b>	<b>622,410</b>	<b>691,740</b>	<b>743,280</b>	<b>825,860</b>	<b>991,570</b>
<b>General Aviation/Other Ops.</b>					
Denver International	40,390	27,380	27,800	30,450	37,560
All Other System Airports	1,998,220	1,712,340	1,792,540	1,861,040	2,036,570
<b>Total</b>	<b>2,038,610</b>	<b>1,739,720</b>	<b>1,820,340</b>	<b>1,891,490</b>	<b>2,074,130</b>
<b>Total Annual Operations</b>					
Denver International	567,550	635,440	682,530	760,450	918,160
All Other System Airports	2,093,470	1,796,020	1,881,090	1,956,900	2,147,540
<b>Total</b>	<b>2,661,020</b>	<b>2,431,460</b>	<b>2,563,620</b>	<b>2,717,350</b>	<b>3,065,700</b>
<b>Based Aircraft</b>					
All System Airports	5,359	5,245	5,351	5,470	5,756



# Performance Measure: ACTIVITY



Percent of Major Airports  
Projected to Operate Under 80% Capacity

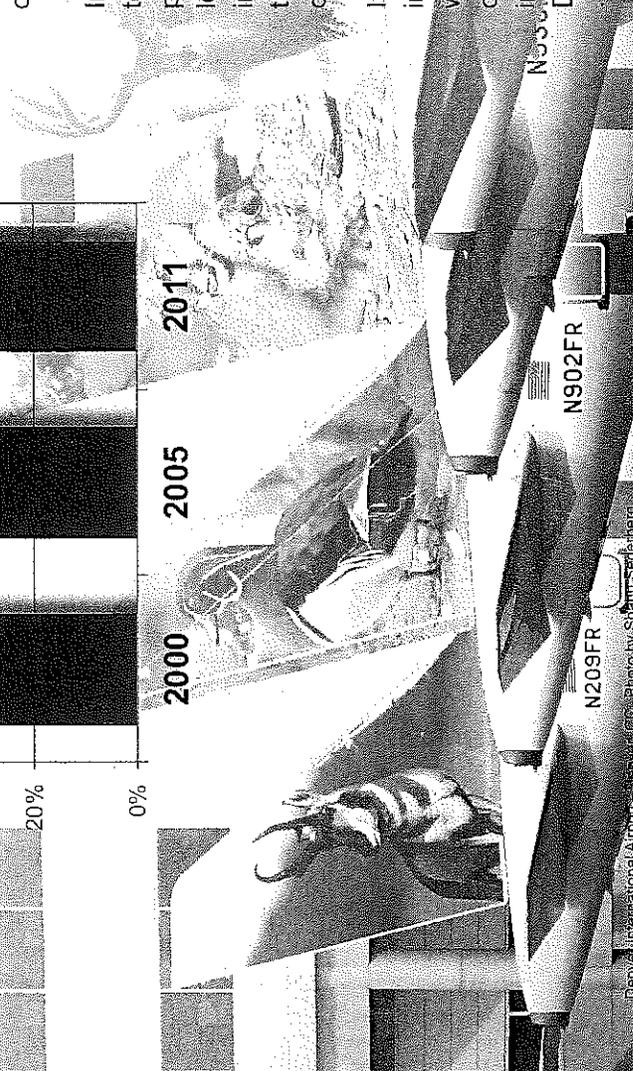


The FAA recommends that when annual demand saturates 80 percent of an airport's ASV, steps should be taken to address operational capacity shortfalls. The system plan includes a target to have all airports operating under an 80 percent demand/capacity ratio. No airports in the Intermediate or Minor categories reached critical demand/capacity thresholds in 2000, 2005, or 2011.

Decreases in annual operations, along with capacity enhancing projects at Centennial and Pueblo Memorial, resulted in fewer airports reaching critical demand/capacity thresholds than did in previous reporting periods. Based on its current ASV, Denver International is the only airport expected to exceed the 80 percent demand/capacity ratio by 2030. In recognition of the need to enhance its operational capacity, Denver International is currently in the process to plan and determine the actual timing for building its seventh runway. This project will provide a significant increase to the airport's operating capacity.

In 2000, nine percent of the airports in the Major category were expected to exceed an 80 percent demand/capacity ratio by the end of the planning period, and this increased to 12 percent by 2005. In 2011, with lower activity levels projected by the end of the planning period and other noted increases in operational capacity, only four percent (or one airport) of the airports in the Major category are expected to reach or exceed the critical 80 percent demand/capacity threshold. This airport, as noted, is Denver International.

It is also important to note that the Division of Aeronautics and FAA investment in Phases I and II of the Colorado Surveillance Project has or will increase operational capacity especially during instrument flight rule conditions. Airports that have benefitted from the surveillance project include those serving Rifle, Craig, Hayden, Steamboat, Gunnison, Telluride, Durango, and Montrose.





# Performance Measure: EXPANSION POTENTIAL



An important part of the mission for the Division of Aeronautics is to help system airports expand to meet the needs of their users. There are many types of projects related to expansion needs that are funded annually by the Division of Aeronautics. To put themselves in the best position to expand, system airports should have current master plans. Airports should also have current Part 77 surfaces and compatible land use planning in place which identify the areas around each airport that need to be protected from height obstructions and from activities that might interfere with the safety of aircraft operations. In addition to identifying their Part 77 surfaces, airports in Colorado should also take steps to have these surfaces incorporated into local planning documents and zoning ordinances. Once Part 77 surfaces are in place, the Division of Aeronautics is often called upon to help address height related obstructions in these areas.

Benchmarks related to current master plans and Part 77 surfaces have been incorporated into the system plan to help evaluate system performance relative to expansion needs. These benchmarks were also used in the 2000 and the 2005 system plans.

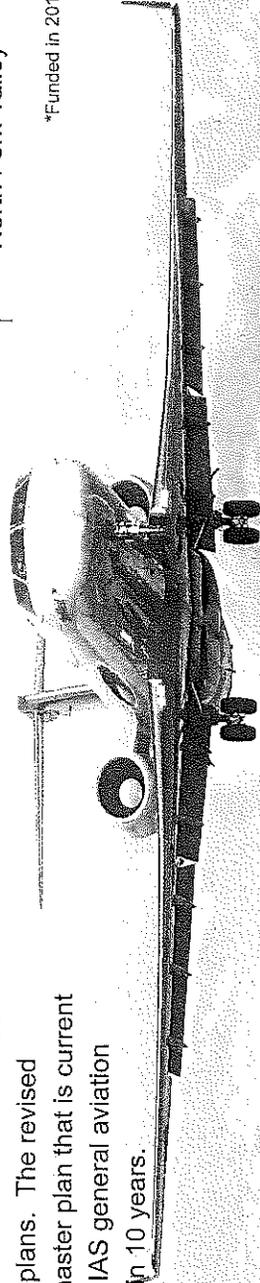
The master planning benchmark applies to publicly-owned and NPIAS airports. During this update, the Division of Aeronautics and FAA worked together to adjust the objective for current master plans. The revised objective is for all commercial airports to have a master plan that is current within seven years and for publicly-owned and NPIAS general aviation airports to have master plans that are current within 10 years.

The currency of master plans will change continually over the planning period; a target has been established to have 70 percent of applicable airports with current master plans in any reporting period. Between now and 2030, applicable system airports will need one or more master plan updates to meet the system plan objectives. Airports that currently need a master plan to meet objectives set in the system plan are shown here. It is worth noting that some of these airports report that they are actually planning to undertake master plans in the near term.

## Airports Needing a Master Plan to Meet Objectives

Major Airports	Intermediate Airports	Minor Airports
Yampa Valley Regional Telluride Regional	Leach Airport Eads Airport Glenwood Spings Springfield Municipal Silver West	Brush Municipal* Haxtun Municipal Holly Airport Julesburg Municipal Cuchara Valley La Animas City & County North Fork Valley

\*Funded in 2012



Denver International Airport - Denver, CO. Photo by Shahn Sederberg

# Performance Measure: EXPANSION POTENTIAL



## Airports with Current Master Plans

	2000	2005	2011
Major Airports	88%	92%	92%
Intermediate Airports	53%	87%	84%
Minor Airports	9%	22%	30%
Applicable System Airports	58%	80%	79%

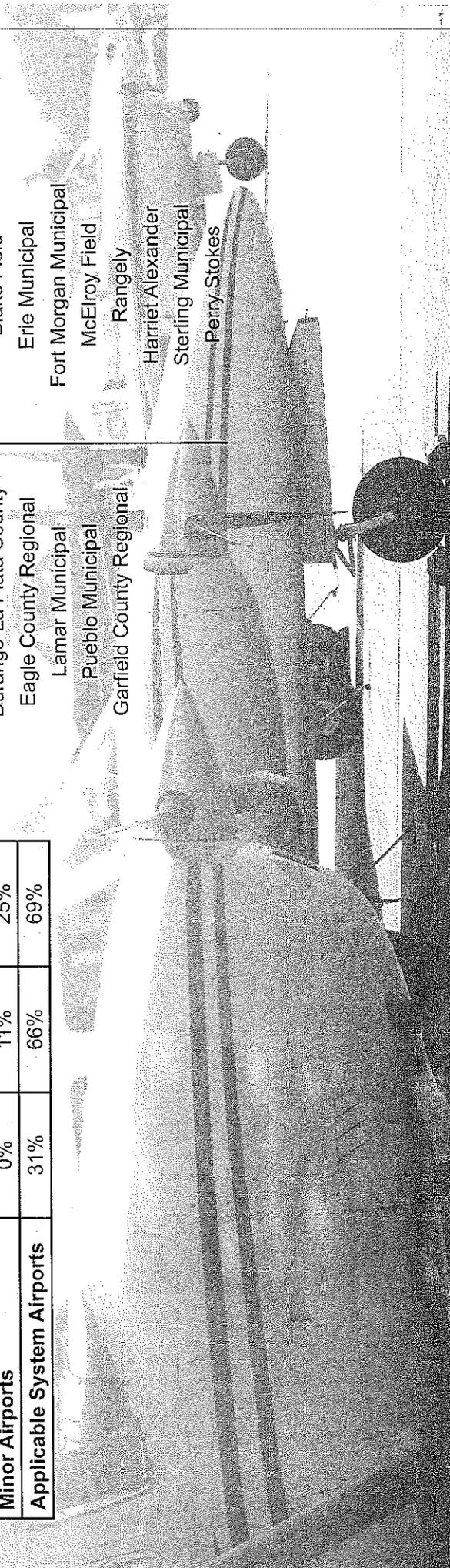
To meet the Part 77 benchmark, airports had to report that current Part 77 surfaces are recognized within the planning documents of surrounding communities. In 2011, fewer Major Airports report that they meet the Part 77 benchmark than did in 2005. In addition to helping airports address Part 77 obstructions, it is recommended that the Division of Aeronautics undertake a focused effort to address the lack of compliance with the Part 77 benchmark at all applicable airports. Major and Intermediate Airports, included in the NPIAS, reporting they do not meet the Part 77 benchmark, are shown here.

## Airports with Part 77 Compliance

	2000	2005	2011
Major Airports	54%	92%	73%
Intermediate Airports	23%	61%	61%
Minor Airports	0%	11%	25%
Applicable System Airports	31%	66%	69%

## Airports Not Meeting Part 77 Benchmark

Major Airports	Intermediate Airports
Colorado Springs	Meadow Lake
Durango-La Plata County	Blake Field
Eagle County Regional	Erie Municipal
Lamar Municipal	Fort Morgan Municipal
Pueblo Municipal	McElroy Field
Garfield County Regional	Rangely
	Harriet Alexander
	Sterling Municipal
	Perry Stokes





# Performance Measure: ECONOMIC SUPPORT



For airports in Colorado to effectively support both the State and local economies, they must be accessible and have various support services. For airports to be accessible from the air, the system plan has adopted an objective for Major Airports to have a precision approach or an approach with vertical guidance and for airports in the Intermediate category to have a non-precision approach. With evolving satellite technology, options for airports to have a published approach are more diverse. However, there are other requirements that airports must also meet before an approach can be approved; it is these additional requirements that occasionally prohibit an airport from having a published approach.

The incorporation of the vertical approach objective is new to this 2011 update of the system plan. Airports in the Major category, both commercial and general aviation, that should continue to be considered for an approach with vertical guidance are shown below. Intermediate Airports that lack a published approach are shown separately.

## Airports Needing Vertical Guidance Approach

### Major Airports: Commercial & General Aviation

- Aspen-Pitkin County
- Eagle County
- Vance Brand Municipal
- Meeker Airport
- Stevens Field
- Telluride Regional

## Intermediate Airports Needing Published Approach

- |                          |                                  |
|--------------------------|----------------------------------|
| Boulder Municipal        | Ft. Morgan Municipal (pending)   |
| Leach Field*             | Glenwood Springs Municipal*      |
| Meadow Lake              | Granby-Grand County              |
| Mineral County*          | Limon Municipal                  |
| Astronaut Kent Rominger* | Rangely                          |
| Blake Field              | Spanish Peaks Airfield (pending) |
| Animas Airpark*          | Silver West*                     |
| Eads*                    | Yuma Municipal                   |

\*Non-NPIAS Airports

Further investigation by the FAA is needed to determine which approaches can actually be implemented. As information in this sections shows, the percentage of system airports with a published approach increased between the 2005 and the 2011 reporting periods:

## Published Approaches in Colorado

	2000	2005	2011
Major Airports	96%	96%	100%
Intermediate Airports	39%	39%	50%
All NPIAS Airports	63%	63%	82%

Granby-Grand County Airport - Granby, CO. Photo by Stehr, Sabetberg

# Performance Measure: ECONOMIC SUPPORT



Other services which help each airport to support both the statewide and local economies include access to fuel and ground transportation services. Colorado's last statewide economic impact study, released in 2008, showed that aviation contributes over \$32 billion each year to the State's economy. When customers have access to fuel and to ground transportation services, the role that airports play in supporting the economy is increased. Ground transportation is especially important to the millions of visitors who reach Colorado each year by air. The system plan has established objectives for all airports in the Major and Intermediate categories to have access to fuel and ground transportation services.

As indicated, system performance related to airports with fuel has improved. However, the percent of system airports in the Intermediate category that have access to ground transportation services for their customers has actually declined. Information on airports in the Intermediate category that need fuel and access to ground transportation services for their customers are shown here.

## Intermediate Airports Needing Improved Services

### Fuel Service

- Mineral County Memorial
- Astronaut Rominger Airport
- Eads Airport
- Springfield Municipal

### Ground Transportation

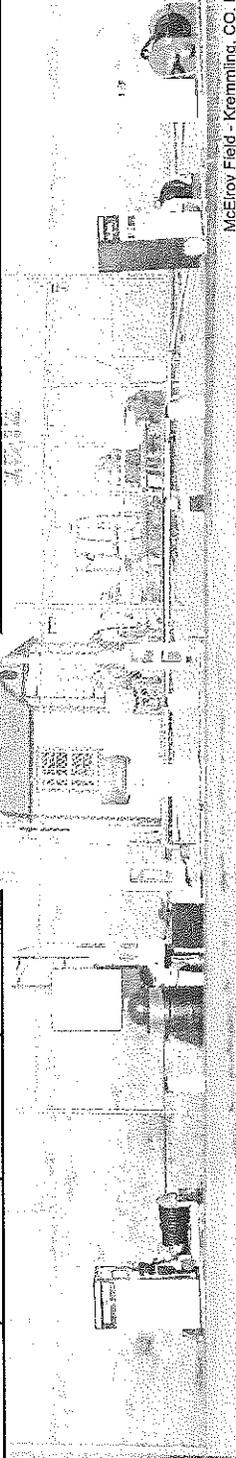
- Leach Airport
- Mineral County Memorial
- Astronaut Rominger Airport
- Eads Airport
- Limon Municipal
- Monte Vista Municipal
- Rangely Airport
- Springfield Municipal
- Silver West Airport
- Yuma Municipal

## Airports With Fuel Service

	2000	2005	2011
Major Airports	100%	100%	100%
Intermediate Airports	85%	84%	88%

## Airports With Ground Transportation Services

	2000	2005	2011
Major Airports	100%	96%	100%
Intermediate Airports	79%	72%	69%



McElroy Field - Kremmling, CO. Photo by Shahn Sederberg



# COVERAGE/EMERGENCY ACCESS

## Performance Measure: EMERGENCY ACCESS

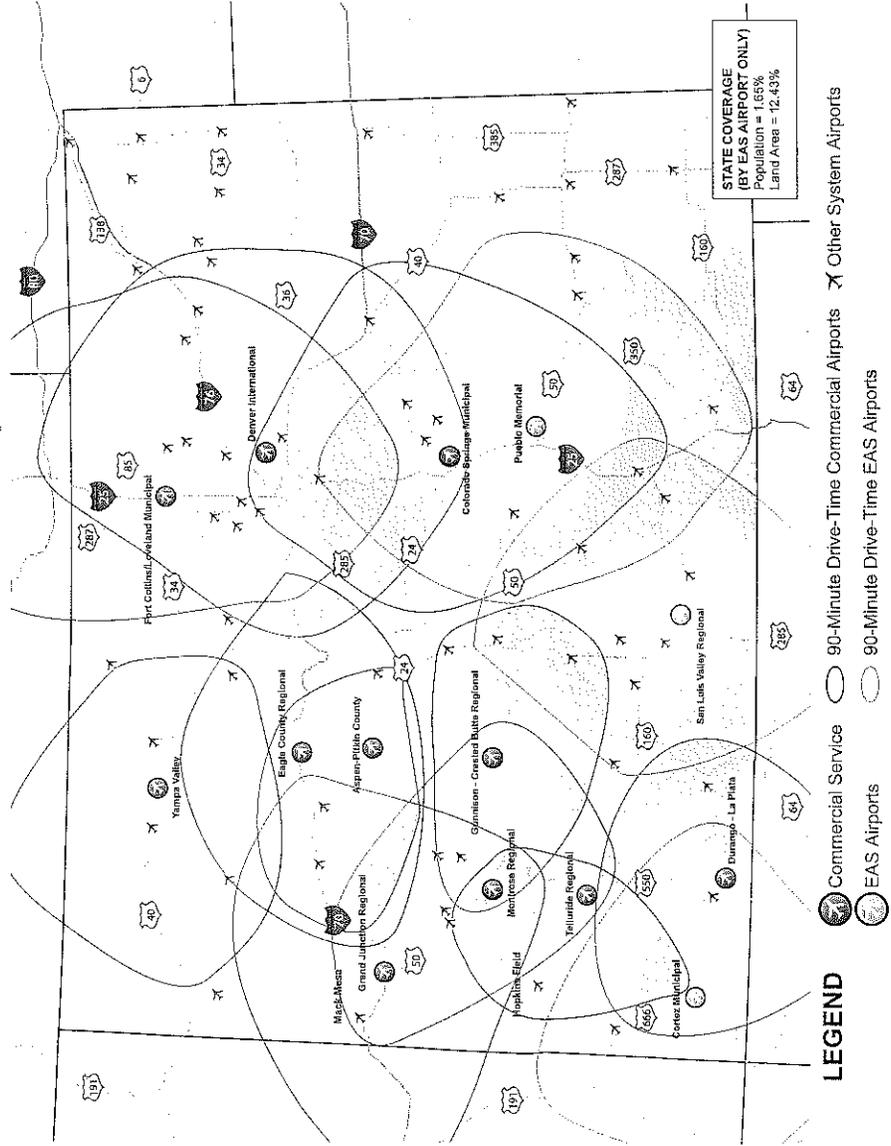
For Colorado to have an effective airport system, the system must be accessible from the ground and from the air. In addition, given its topography and the distribution of its population, it is also essential for airports in Colorado to support the needs of emergency aircraft.

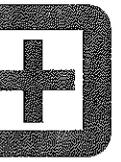
GIS analysis completed in the system plan shows that 94 percent of Colorado's population is within 30 minutes or less of any system airport, and 99 percent of the State's population is within 90 minutes or less of an airport with scheduled commercial airline service. This includes commercial airports in Colorado as well as commercial airports in neighboring states. With the exception of Eastern Colorado, almost all of the remainder of the State is within a 90-minute drive time of one or more commercial airports. Residents in this area of the State most often use Denver International, Colorado Springs Municipal, or Pueblo Memorial for their commercial air travel needs.

It is worth noting that there are airports that help meet Colorado's commercial air travel needs with service supported by operating subsidies from the Essential Air Service (EAS) program. The Division of Aeronautics should monitor the status of this program for the following reasons: future re-authorizations of the Airport Improvement Program (AIP) may not include funding for this

program; future changes in EAS program eligibility could impact some airports in Colorado; and the number of carriers participating in this program and the aircraft equipment types suited to EAS routes are dwindling. Loss of commercial airline service at EAS airports would have a greater impact on land area as opposed to population within a 90-minute drive of a commercial service airport.

### Service Areas of Commercial Airports in Colorado





# Performance Measure: COVERAGE/EMERGENCY ACCESS

An important aspect of accessibility for Colorado's airports relates to weather reporting equipment. The system plan's objective is for all airports in the Major and Intermediate categories to have on-site weather reporting equipment. Investing to meet the objectives for weather reporting equipment has been important to the Division of Aeronautics, and the system has improved accordingly. There are, however, nine airports in the Intermediate category that still need weather reporting equipment in order for the system to be fully compliant with the weather reporting objective.

The number of airports with weather reporting improved as did the percent of land area and population within 25 nautical miles of an airport with weather reporting. The Division of Aeronautics recently issued a grant to provide weather reporting equipment for Astronaut Rominger Airport.

## Intermediate Airports Needing On-Site Weather Reporting Equipment

Leach Airport	Monte Vista Municipal
Mineral County	Springfield Municipal
Astronaut Rominger	Spanish Peaks Airfield
Animas Airpark	Silver West Airport
Eads Airport	Yuma Municipal

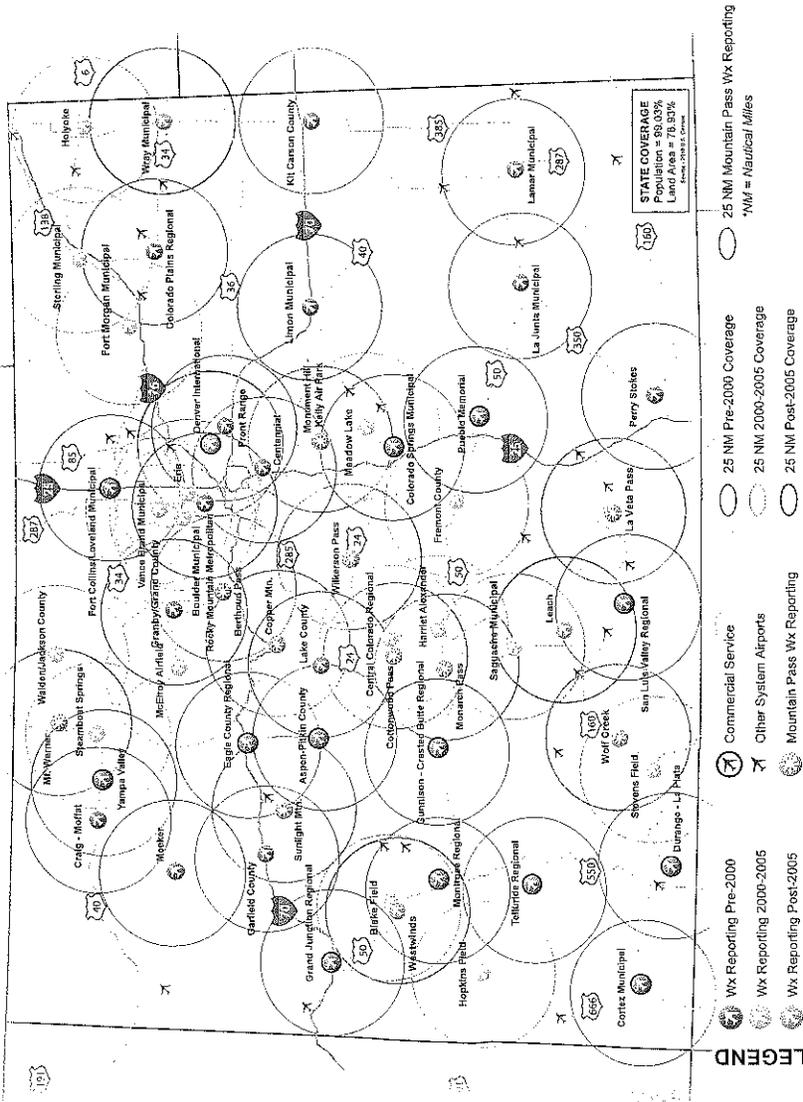
## Airports with Weather Reporting Equipment

	2000	2005	2011
Major Airports	92%	100%	100%
Intermediate Airports	24%	63%	69%
Major / Intermediate Airports	52%	79%	83%

## Area and Population within 25 Nautical Miles of Weather Reporting Equipment

	2000	2005	2011
Population	94%	99%	99%
Land Area	53%	76%	79%

## Coverage Provided by Weather Reporting Facilities Since 2000



McElroy Field - Kremmling, CO. Photo by Shaah Sederberg



# COVERAGE/EMERGENCY ACCESS

## Performance Measure: EMERGENCY ACCESS

There are two types of aircraft that are most often used to support both patient and physician emergency transport needs in Colorado, the King Air B200 and Learjet 35. Operators of these aircraft provided input to the system plan to identify minimum operating requirements for these aircraft; these include a minimum runway length based on the aircraft type and the elevation of the airport, a published approach, weather reporting equipment, HIRL or MIRL, and a rotating beacon.

Emergency operators of the Learjet 35 have requirements similar to those of the King Air B200 emergency aircraft, but this aircraft has a longer minimum runway length requirement. There are only two airports in the Major category that do not meet the minimum runway length for the Learjet 35. The runway at the Meeker Airport is approximately 300 feet short of the objective and the runway at Vance Brand Municipal is approximately 1,600 feet less than the minimum objective for the Learjet 35. All other Major Airports meet all minimum operating requirements for the Learjet 35 emergency aircraft.

There are also four Intermediate Airports that meet all minimum operating requirements for the Learjet 35; these airports are Colorado Plains Regional Airport, Central Colorado Regional Airport, La Junta Municipal Airport, and Harriet Alexander Airport.

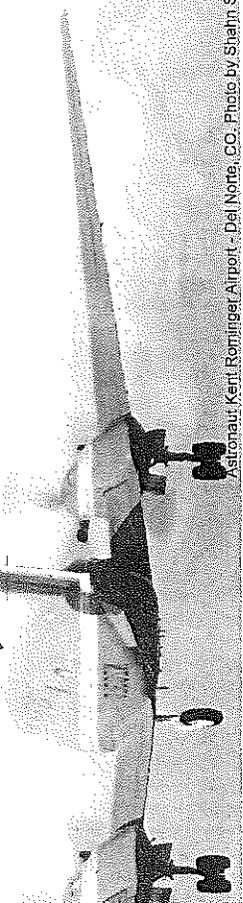
All Major Airports currently have all facilities in place to meet the minimum requirements of emergency operators flying the King Air B200. There are 14 airports in the Intermediate category that also meet all minimum requirements identified by the operators of the King Air B200. The remainder of the airports in the Intermediate category need one or more facilities, as shown here, to meet all of the minimum requirements of the King Air B200 emergency aircraft operators.

Going forward, emphasis should be placed on increasing the number of system airports that meet the minimum operating requirements of operators flying the King Air B200 emergency aircraft.

### Facility Needs for King Air Emergency Aircraft Operators

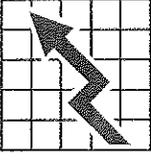
Airport	Runway Length	Approach	Runway Lighting	Weather Reporting	Rotating Beacon
Boulder Municipal	900 feet	Needed	In Place	In Place	In Place
Leach Airport	In Place	Needed	Needed	Needed	In Place
Meadow Lake	In Place	Needed	In Place	In Place	In Place
Mineral County	In Place	Needed	Needed	Needed	Needed
Blake Field	In Place	Needed	In Place	In Place	In Place
Astronaut Rominger	In Place	Needed	Needed	Needed	Needed
Animas Airpark	290 feet	Needed	Needed	Needed	Needed
Eads Airport	740 feet	Needed	Needed	Needed	Needed
Erie Municipal	100 feet	In Place	In Place	In Place	In Place
Fort Morgan	In Place	Pending	In Place	In Place	In Place
Glenwood Springs	2,000 feet	Needed	Needed	Needed	Needed
Granby-Grand County	300 feet	Needed	In Place	In Place	In Place
Limon Municipal	100 feet	Needed	In Place	In Place	In Place
Monte Vista Municipal	In Place	In Place	In Place	Needed	In Place
Hopkins Field	700 feet	In Place	In Place	In Place	In Place
Rangely Airport	In Place	Needed	In Place	In Place	In Place
Springfield Municipal	In Place	In Place	In Place	Needed	In Place
Steamboat Springs	900 feet	In Place	In Place	In Place	In Place
Spanish Peaks	In Place	Pending	Needed	Needed	Needed
Silver West	In Place	Needed	Needed	Needed	Needed
Yuma Municipal	1,100 feet	Needed	In Place	Needed	In Place

✓ Denotes airport needing fewest improvements to meet emergency operator needs.



Astronaut, Keri Rominger Airport - Del Norte, CO. Photo by Shaun Sedberry.

# Performance Measure: INVESTMENT



The investment performance measure is designed to ensure that the Division of Aeronautics is maximizing its historic investment. This is accomplished by identifying airports that could benefit from extensions to primary runways that are already in place and by identifying primary runway, taxiway, and apron pavements that could benefit from maintenance to improve their pavement condition index (PCI) rating.

Primary runway length objectives for system airports were established by the system plan as follows:

- Major commercial and reliever airports – 75 percent of large aircraft at 90 percent useful load
- Other Major general aviation airports – 100 percent of all small aircraft
- All Intermediate Airports – 75 percent of small aircraft
- All Minor Airports – Maintain existing runway length

The 2011 update to the system plan incorporated new FAA guidance on calculating runway length requirements; this resulted in longer runway length objectives for several airports in the Major category. As a result, fewer airports in the Major category meet their runway length objective in 2011 than did in 2005.

Previous analysis has shown that it is not feasible for all airports to meet their runway length objectives identified in the system plan; and the system plan, as part of its recommendations, considers these previous findings. Airports in the Major category that could be considered for runway extensions to help them better meet system plan runway length objectives are as follows:

**Cortez-Montezuma County**  
**Vance Brand Municipal**  
**Meeker**

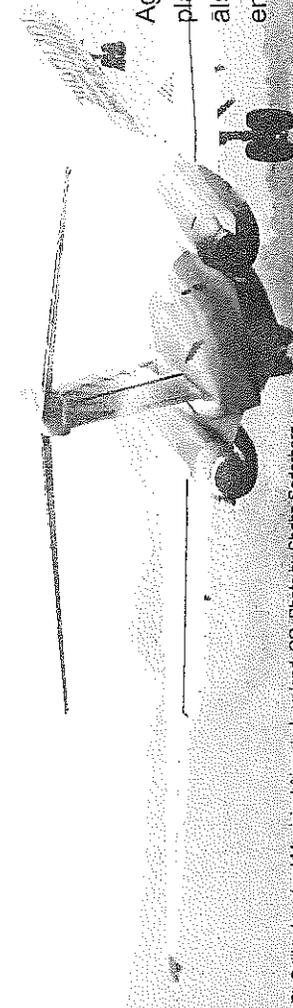
**Stevens Field**  
**Front Range**

Actual lengths for runway extensions should be confirmed in an airport master plan and should be pursued based on actual need. Airports in the Intermediate category that could be considered for runway extensions include:

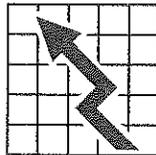
**Mineral County**  
**McElroy Field**  
**Lake County**  
**Monte Vista**

**Hopkins Field**  
**Steamboat Springs**  
**Walden-Jackson County**  
**Spanish Peaks Airfield**

Again, all runway extensions should be vetted through an airport master plan. For Intermediate Airports shown above, any runway extension should also consider minimum length requirements for the predominant types of emergency aircraft that serve the State.



Ft. Collins-Loveland Municipal Airport - Loveland, CO. Photo by Shainn Seiderberg



# Performance Measure: INVESTMENT

There are many types of projects that the Division of Aeronautics funds to help maintain and improve the condition of primary runway, taxiway, and apron pavements. A benchmark to evaluate the condition of primary runway pavements has been in place since 2000. New benchmarks to report on the pavement condition for primary taxiways and apron areas were added as part of this 2011 system plan update. Since the condition of primary pavement areas continually change, for any given reporting period, results will differ. The system plan has established an objective for all primary pavements to have a PCI rating of 75 or greater. At a rating of 75, pavements are generally considered to be in good condition but may still benefit from certain types of investment for pavement maintenance. All airports in the Major, Intermediate, and Minor categories that are included in the Division of Aeronautics Pavement Management Program are analyzed in association with the three pavement benchmarks. Airports currently needing a pavement project to meet system plan objectives for a PCI of 75 or greater on its primary runway, taxiway, and/or apron area are shown below.

## PRIMARY RUNWAY PCI

Major Airports	Lamar	Meeker*		
Intermediate Airports	Colorado Plains Regional*	Kit Carson County	Perry Stokes*	Leach Field*
	Meadow Lake*	Mineral County*	Animas Airpark	Eads
	Fort Morgan Municipal	Glenwood Springs Municipal*	McElroy Field	Lake County*
	Hopkins Field*	Walden-Jackson County*	Spanish Peaks*	Yuma*
Minor Airports	Brush Municipal	Cuchara Valley	Las Animas City & County*	

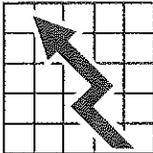
## PRIMARY TAXIWAY PCI

Major Airports	Grand Junction	Lamar	Ft. Collins Loveland	Front Range*
Intermediate Airports	Fremont County	Meadow Lake*	La Junta*	Springfield*

## PRIMARY APRON PCI

Major Airports	Rocky Mountain Metropolitan*	Durango-La Plata County*	Lamar*	Meeker*
Intermediate	Stevens Field*	Pueblo*		
	Colorado Plains Regional	Boulder*	Astronaut Rominger	Blake Field*
	Animas Airpark	Fort Morgan Municipal*	Glenwood Springs	Springfield*
	Walden-Jackson County	Yuma*	Sterling Municipal*	
Minor Airports	Brush	Julesburg	Cuchara Valley	Las Animas City & County*

\*Pavement related grant issued by the Division of Aeronautics



# Performance Measure: INVESTMENT

As shown, the percent of system airports meeting the PCI objective for their primary runway has varied among the three reporting periods, but has remained somewhat similar. In subsequent updates to the system plan, PCIs for primary taxiways and primary apron areas will be measured against performance reported in this plan. For the Minor Airports included in the Division of Aeronautics' Pavement Management Program, none have a paved primary taxiway. Given the fact that PCIs are always changing, a target has been established to have 70 percent of all primary pavements meet a PCI of 75 or above.

## Primary Runway PCI Ratings of 75 or Above

	2000	2005	2011
Major Airports	83%	80%	81%
Intermediate Airports	55%	69%	59%
Minor Airports	10%	11%	17%
Applicable System Airports	63%	70%	67%

## Airports Meeting PCI Objectives in 2011

	Primary Taxiway	Primary Apron
Major Airports	83%	73%
Intermediate Airports	75%	66%
Minor Airports	N/A	20%
Applicable System Airports	80%	65%



# Performance Measure: SECURITY

The Security Performance Measure was added as part of the 2005 system plan update in response to TSA security guidelines for general aviation airports released in 2004. In order to identify security measures and equipment most appropriate for each general aviation airport, TSA also provides a procedure for assigning airports to levels of relative and perceived risk. In its guidelines, TSA identified 18 different types of security related equipment or procedures. As an airport's perceived level of risk increases, the types of security related equipment and procedures that it should have in place also increases.

As part of the 2005 system plan update, the Division of Aeronautics determined that it was appropriate for all airports in the Colorado system to have six basic security related enhancements in place. These six enhancements are as follows:

- All Aircraft Secured
- Community Watch Programs
- Positive Identification of Passengers, Cargo, and Baggage
- Emergency/Security Contact List
- Documented Security Procedures
- Signs Providing Information to Report Suspicious Activity

Information on system progress related to these six factors between 2005 and 2011 is shown here. System performance increased between 2005 and 2011 for four of the factors and decreased for the other two factors. The technical report for the system plan provides airport specific information on appropriate security related procedures and equipment.

Documented Security Procedures	2005	2011
Major	73%	67%
Intermediate	19%	16%
Minor	18%	17%
All Airports	28%	26%

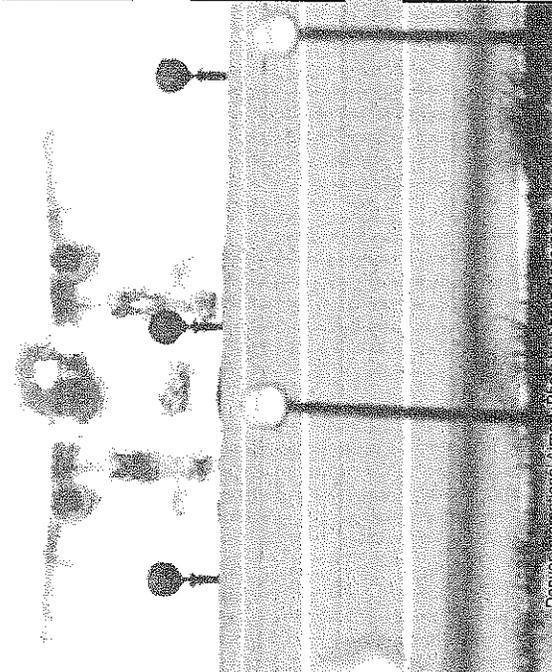
Positive Identification	2005	2011
Major	100%	100%
Intermediate	56%	63%
Minor	41%	44%
All Airports	60%	65%

Signs	2005	2011
Major	82%	83%
Intermediate	44%	41%
Minor	35%	33%
All Airports	48%	47%

All Aircraft Secured	2005	2011
Major	91%	100%
Intermediate	84%	84%
Minor	76%	72%
All Airports	83%	84%

Community Watch Program	2005	2011
Major	91%	100%
Intermediate	63%	66%
Minor	29%	33%
All Airports	58%	63%

Contact List	2005	2011
Major	91%	100%
Intermediate	91%	91%
Minor	65%	61%
All Airports	83%	84%



Denver International Airport. Photo by Shari Bergberg



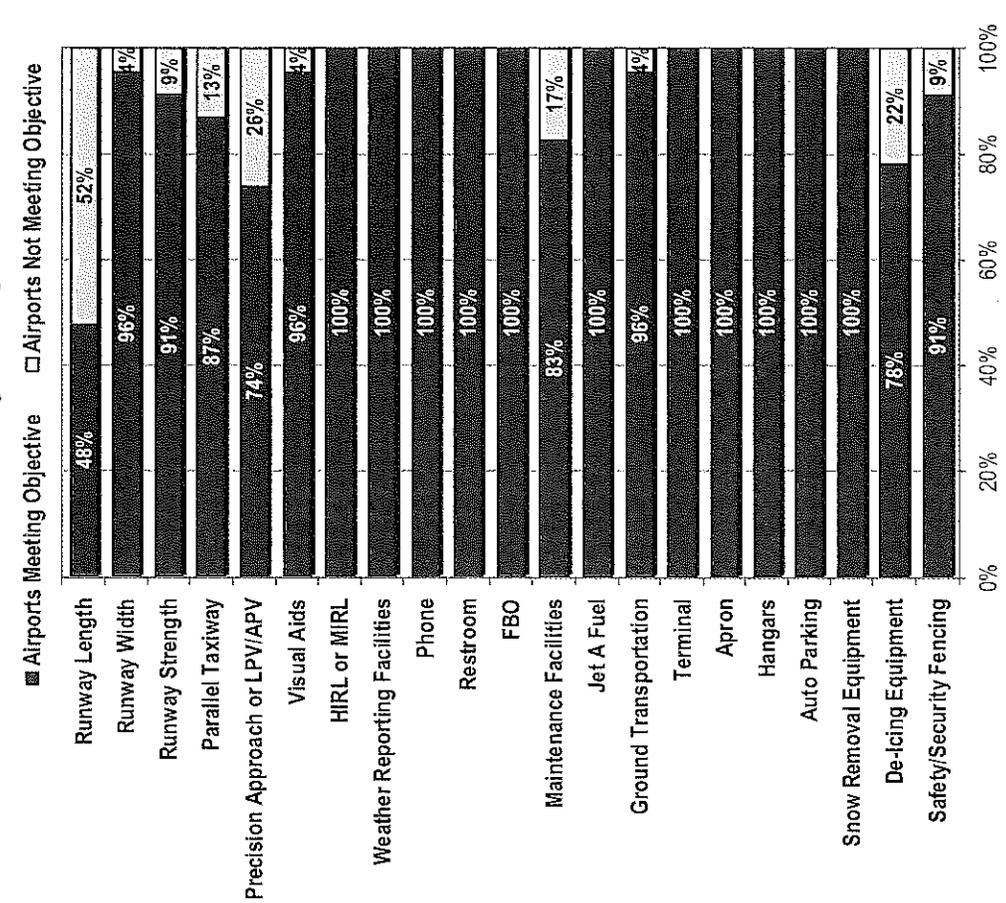
# FACILITY & SERVICE OBJECTIVES

The system plan includes facility, service, and equipment objectives for airports assigned to each of the three role categories. These objectives have been refined and expanded as appropriate since they were established in 2000. Objectives reflect desirable development to best fulfill airport roles. Facility, service, and equipment objectives are not standards or requirements. Establishment of these objectives does not constitute a funding commitment on behalf of either the Division of Aeronautics or the FAA. When airport master plans are developed, applicable facility, service, and equipment objectives should be considered. The need for and sizing of more complex facilities is best verified within the context of an airport master plan.

Since the 2005 system plan update, Major Airports have shown improvement in their ability to meet objectives related to runway strength, parallel taxiway systems, visual landing aids, and runway lighting. Intermediate airports have shown improvement related to published approaches, on-site weather reporting equipment, taxiway systems, and visual landing aids. A higher percentage of Minor Airports meet their runway lighting and strength objectives.

The accompanying charts report on the ability of airports in each of the three role categories to meet their assigned facility, service, and equipment objectives. Projects needed to improve system performance relative to performance measures and their associated benchmarks and to improve airport performance relative to the plan's facility, service, and equipment objectives form the basis for cost estimates to improve and maintain Colorado's airport system in the coming years.

## Major Airports

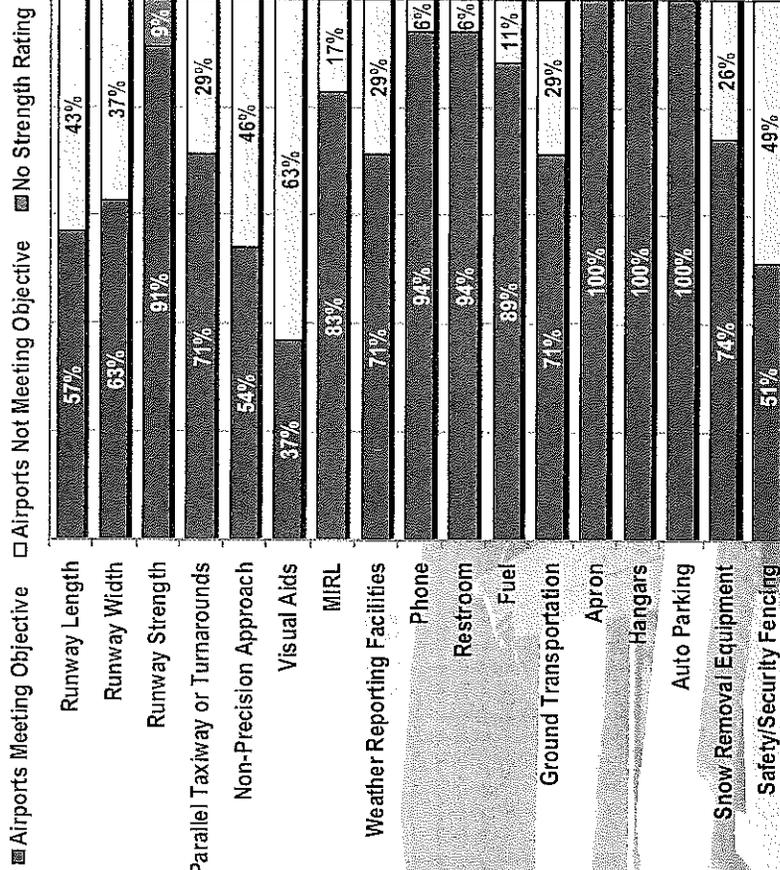


(Charts for Intermediate & Minor Airports continued on Page 18)

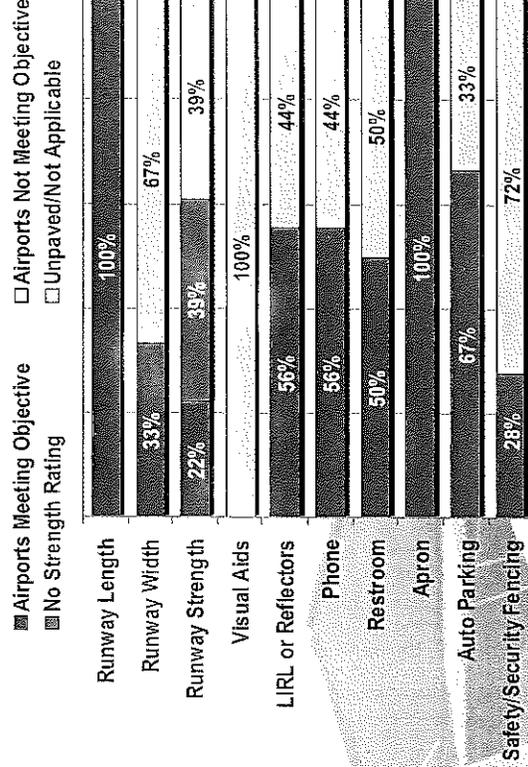
# FACILITY & SERVICE OBJECTIVES



## Intermediate Airports



## Minor Airports



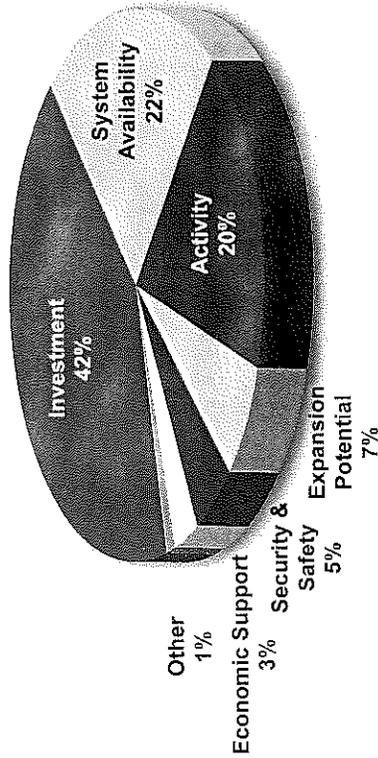
Vance Brand Municipal Airport - Longmont, CO. Photo by Shahn Sederberg



# PLAN IMPLEMENTATION

The 2011 update to Colorado's Aviation System Plan identified projects needed to elevate system performance. All airports in the State Airport System are eligible for funding from the Division of Aeronautics; when the Division responds to an airport's grant request, they consider how the project relates to the system plan. The accompanying chart shows how grants issued by the Division of Aeronautics over the past four years relate to the system plan's performance measures.

## Investment by Performance Measure 2009-2012

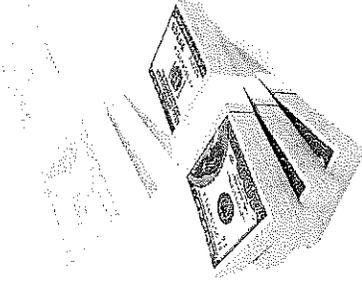


Cost estimates prepared for the system plan show that over the 20-year planning period, over \$615 million could be needed to elevate system performance relative to this plan's benchmarks and facility, service, and equipment objectives. In addition to costs to implement the system plan, six-year capital improvement plans (CIP) submitted to the Division of Aeronautics by system airports show another \$474 million in development needs. Over the 20-year planning period, total CIP costs for all system airports could reach \$1.6 billion. Combined, system plan and current and estimated CIP costs for Colorado airports, with the exception of Denver International, could total approximately \$2.2 billion over the next 20 years.

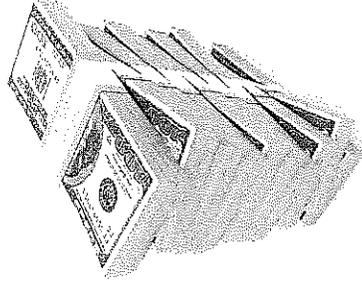
Funds for the Division of Aeronautics' grant program are derived from a State tax on aviation fuel. FAA grants come from the Airport Improvement Program (AIP); AIP is 100 percent funded by airport user taxes. When anticipated funds from the Division of Aeronautics, FAA, and local airport sponsors are considered, it is estimated that over the next 20 years, \$1.3 billion in funding could be available to respond to combined system plan and CIP costs. This leaves a potential funding gap of \$900 million. Reductions in AIP or in funds available from CDOT through the State fuel tax program have the potential to widen the funding gap.

For Colorado to have a balanced and viable airport system, strategic investment in those airports and those projects that are most essential to the success of the system is important. The 2011 Colorado Aviation System plan provides the Division of Aeronautics with information to support future investment decisions.

**FUNDING SHORTFALL  
\$900 Million**



**Estimated Available  
FAA/State/Local Funding  
\$1.3 Billion**



**Estimated Colorado Airport  
Funding Needs  
\$2.2 Billion**

# SUMMARY



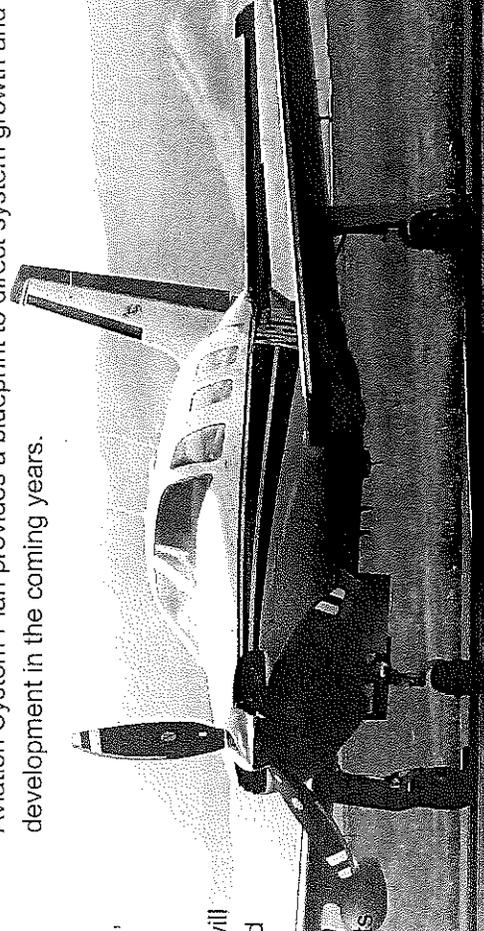
Colorado's Aviation System Plan is an important planning tool. The State's system plan provides an important bridge between the NPIAS and individual airport master plans that are prepared for airports in Colorado. Through its performance measures, the system plan helps Colorado achieve a balanced and viable airport system. The system plan identifies projects that are desirable to meet Colorado's transportation needs and its economic objectives.

Evaluation measures and airport roles, which form the basis for Colorado's system planning process, were first established in 2000. As FAA planning standards, technology, and airport and community conditions have changed; the framework for Colorado's Aviation System Plan has been modified accordingly. Based on the current aviation environment, the process to evaluate system performance and the procedures for determining airport roles remain solid.

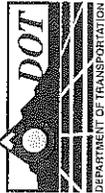
When Colorado's Aviation System Plan is again updated in the 2017 time frame, it would be appropriate to re-visit system performance measures and their associated benchmarks to determine needed additions or adjustments. Likewise, as FAA planning guidance changes, facility, service, and equipment objectives contained in the system plan should also be adjusted, as appropriate, to reflect any change. Sometime in 2012, FAA is scheduled to release its ASSET Study; in this study, for the first time, FAA will distinguish roles for general aviation airports. Previously, FAA has classified general aviation airports in the NPIAS as being only reliever or general aviation. When Colorado's Aviation System Plan is next updated, it would be appropriate to review the Division of Aeronautics' airport role assignments and identify changes based on FAA's role assignments for general aviation airports.

Aviation will continue to change and technology will continue to evolve. Colorado is already on the leading edge of many technology changes as a result of its ground-breaking surveillance projects for mountain airports. This project made Colorado a leader in the implementation of FAA's NextGen airspace systems. As commercial applications for aviation technology change, projects are underway which will identify airports to be designated as spaceports and to serve flights by unmanned aerial systems (UASs).

By updating its aviation system plan on regular intervals, Colorado has the opportunity to expand and adjust the plan to reflect changes in technology; changes in FAA planning guidance; and changes in State, community, or airport conditions. On an annual basis, commercial and general aviation airports in Colorado support an estimated \$10 billion in economic activity. When the annual economic impact of Denver International is considered, this figure increases to \$32 billion. Airports in Colorado are important transportation and economic resources, and the 2011 update to the Colorado Aviation System Plan provides a blueprint to direct system growth and development in the coming years.

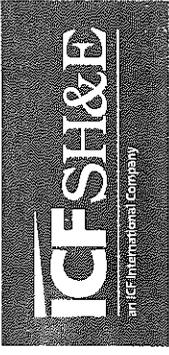


Silver West Airport - Westcliffe, CO - Photo by Shahn Sokorberg

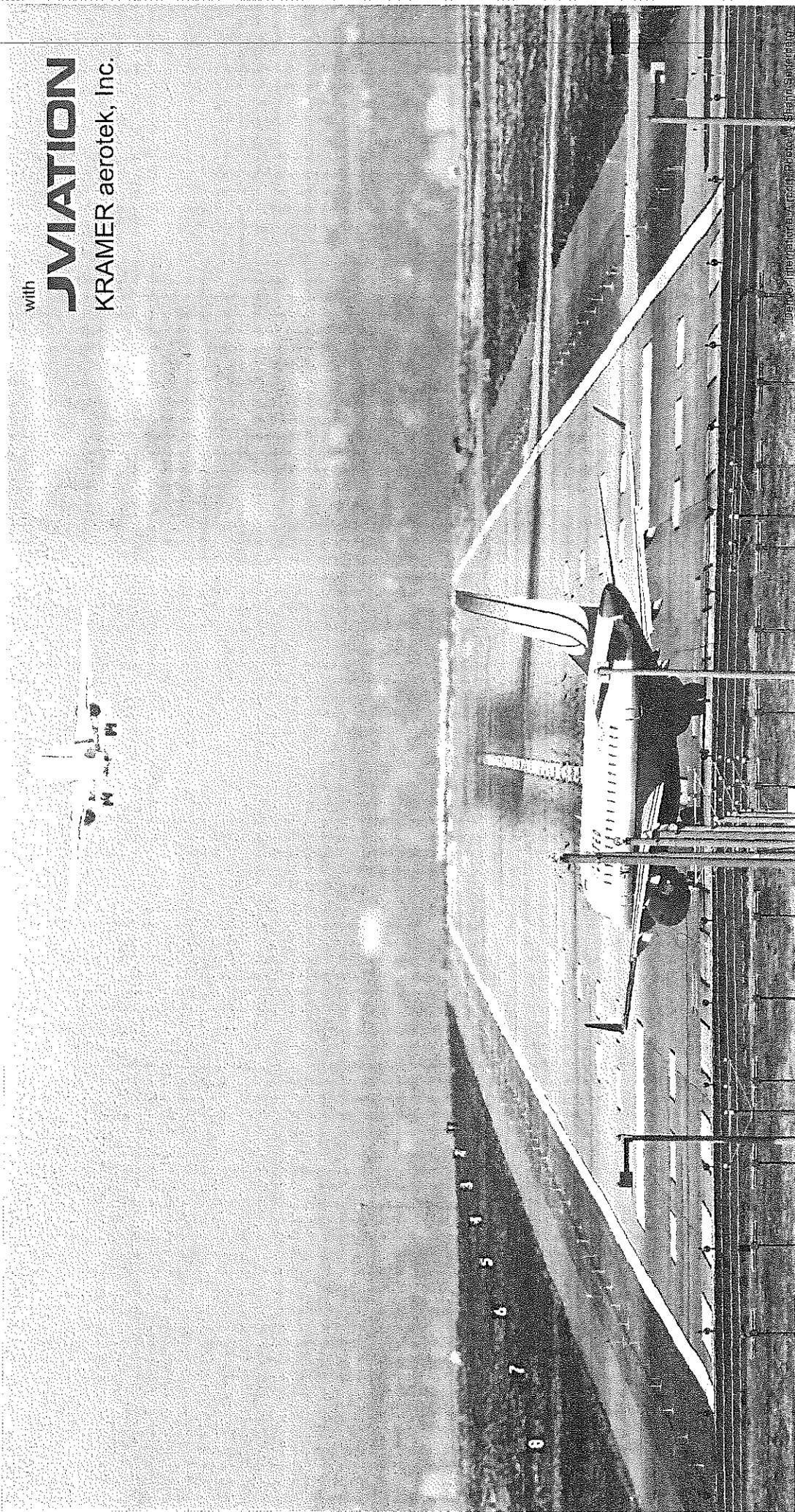


Colorado Department of Transportation  
 Division of Aeronautics  
 5126 Front Range Parkway  
 Watkins, CO 80137  
 303.261.4418  
[www.colorado-aeronautics.org](http://www.colorado-aeronautics.org)

Prepared by



with **AVIATION**  
 KRAMER aerotek, Inc.

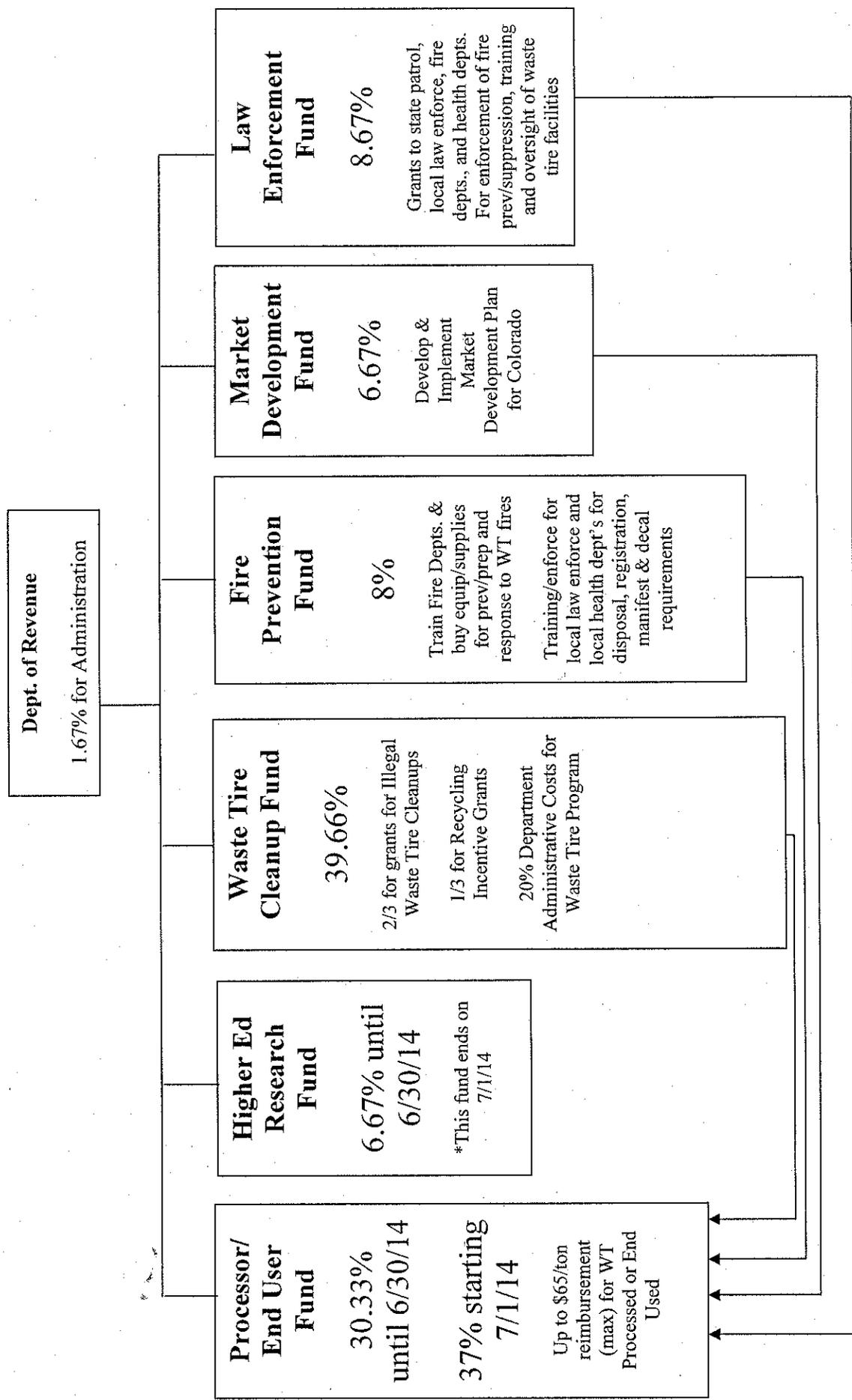


Denver International Airport, Colorado, USA

**Attachment G can be viewed at State Archives.**

# Waste Tire Program Funding Breakdown

**\$1.50 collected for each new tire sold**



## Processor & End User Reimbursement Program

### Fiscal Year Payouts (Actual)

Calendar Year 2013

	<i>Processor total tons approved</i>	<i>Final processor rate per ton</i>	<i>Total payout for processors</i>	<i>End user total tons approved</i>	<i>Final End User Rate Per Ton</i>	<i>Total Payout for End Users</i>	<i>Total Payout for Month</i>
January-12	3,071.13	\$21.62	\$66,397.72	2,695.36	\$43.23	\$116,520.41	\$182,918.14
February-12	1,475.93	\$8.62	\$12,722.47	5,203.19	\$17.20	\$89,494.87	\$102,217.34
March-12	2,177.18	\$29.55	\$64,335.67	1,357.28	\$59.08	\$80,188.10	\$144,523.77
April-12	1,950.54	\$11.09	\$21,631.49	4,614.00	\$22.15	\$102,200.10	\$123,831.59
May-12	2,893.08	\$16.31	\$47,186.20	1,935.99	\$32.62	\$63,152.03	\$110,338.23
June-12	2,334.90	\$9.09	\$21,224.21	5,701.94	\$18.14	\$103,433.19	\$124,657.41
July-12	3,242.82	\$14.65	\$47,507.30	3,211.65	\$29.28	\$94,037.11	\$141,544.41
August-12	6,482.24	\$65.00	\$421,345.60	9,073.25	\$65.00	\$589,761.25	\$1,011,106.85
September-12	4,405.07	\$65.00	\$286,329.55	4,111.20	\$65.00	\$267,228.00	\$553,557.55
October-12	3,893.51	\$65.00	\$253,078.15	4,922.34	\$65.00	\$319,952.10	\$573,030.25
November-12	3,539.40	\$65.00	\$230,061.00	3,175.07	\$65.00	\$206,379.55	\$436,440.55
December-12	2,677.13	\$65.00	\$174,013.45	1,890.37	\$65.00	\$122,874.05	\$296,887.50
<b>Totals</b>	<b>38,142.92</b>	<b>***</b>	<b>\$1,645,832.82</b>	<b>47,891.64</b>	<b>***</b>	<b>\$2,155,220.76</b>	<b>\$3,801,053.58</b>



# Processor & End User Reimbursement Program

Calendar Year 2013 Monthly Breakdown

January 2012 Processor & End User Program Reimbursements				
Processor	Processor total tons approved	Final processor rate per ton	Total payout for processor	Tire-derived Product Processed
Front Range Tire Recycle	1,209.75	\$21.62	\$26,154.80	Alternative Daily Cover & Tire Bales
Geocycle	1,649.00	\$21.62	\$35,651.38	Tire-derived Fuel
Colorado Tire Solutions	212.38	\$21.62	\$4,591.55	Highway Products
<b>Total Processor Payout</b>	<b>3,071.13</b>	<b>\$21.62</b>	<b>\$66,397.72</b>	
End User	End user total tons approved	Final End User Rate Per Ton	Total Payout for End Users	Tire-derived Product End Used
Allied Waste	1,689.65	\$43.23	\$73,043.57	Alternative Daily Cover
Holcim	790.00	\$43.23	\$34,151.70	Tire-derived Fuel
Waste Management	125.23	\$43.23	\$5,413.69	Alternative Daily Cover
Sedgwick County Landfill	90.48	\$43.23	\$3,911.45	Alternative Daily Cover
<b>Total End User Payout</b>	<b>2,695.36</b>	<b>\$43.23</b>	<b>\$116,520.41</b>	
<b>Total for January 2012</b>	<b>5,766.49</b>	<b>***</b>	<b>\$182,918.14</b>	

February 2012 Processor & End User Program Reimbursements				
Processor	Processor total tons approved	Final processor rate per ton	Total payout for processor	Tire-derived Product Processed
Geocycle	1,172.00	\$8.62	\$10,102.64	Tire-derived Fuel
Colorado Tire Solutions	303.93	\$8.62	\$2,619.83	Highway Products
<b>Total Processor Payout</b>	<b>1,475.93</b>	<b>\$8.62</b>	<b>\$12,722.47</b>	
End User	End user total tons approved	Final End User Rate Per Ton	Total Payout for End Users	Tire-derived Product End Used
Allied Waste	978.19	\$17.20	\$16,824.87	Alternative Daily Cover
Holcim	4,225.00	\$17.20	\$72,670.00	Tire-derived Fuel
<b>Total End User Payout</b>	<b>5,203.19</b>	<b>\$17.20</b>	<b>\$89,494.87</b>	
<b>Total for February 2012</b>	<b>6,679.12</b>	<b>***</b>	<b>\$102,217.34</b>	

March 2012 Processor & End User Program Reimbursements				
Processor	Processor total tons approved	Final processor rate per ton	Total payout for processor	Tire-derived Product Processed
Geocycle	1,799.00	\$29.55	\$53,160.45	Tire-derived Fuel
Colorado Tire Solutions	378.18	\$29.55	\$11,175.22	Highway products
<b>Total Processor Payout</b>	<b>2,177.18</b>	<b>\$29.55</b>	<b>\$64,335.67</b>	
End User	End user total tons approved	Final End User Rate Per Ton	Total Payout for End Users	Tire-derived Product End Used
Allied Waste	1,272.55	\$29.08	\$75,182.25	Alternative Daily Cover
Sedgwick County Landfill	84.73	\$29.08	\$5,005.85	Alternative Daily Cover
<b>Total End User Payout</b>	<b>1,357.28</b>	<b>\$29.08</b>	<b>\$80,188.10</b>	
<b>Total for March 2012</b>	<b>3,534.46</b>	<b>***</b>	<b>\$144,523.77</b>	

April 2012 Processor & End User Program Reimbursements				
Processor	Processor total tons approved	Final processor rate per ton	Total payout for processor	Tire-derived Product Processed
Geocycle	1,419.00	\$11.09	\$15,736.71	Tire-derived Fuel
Colorado Tire Solutions	468.45	\$11.09	\$5,195.11	Highway Products
Resource Management Company	63.09	\$11.09	\$699.67	Alternative Daily Cover
<b>Total Processor Payout</b>	<b>1,950.54</b>	<b>\$11.09</b>	<b>\$21,631.49</b>	
End User	End user total tons approved	Final End User Rate Per Ton	Total Payout for End Users	Tire-derived Product End Used
Allied Waste	848.03	\$22.15	\$18,783.86	Alternative Daily Cover
Sedgwick County Landfill	70.97	\$22.15	\$1,571.99	Alternative Daily Cover
Holcim	3,695.00	\$22.15	\$81,844.25	Tire-derived Fuel
<b>Total End User Payout</b>	<b>4,614.00</b>	<b>\$22.15</b>	<b>\$102,200.10</b>	
<b>Total for April 2012</b>	<b>6,564.54</b>	<b>***</b>	<b>\$123,831.59</b>	

# Processor & End User Reimbursement Program

Calendar Year 2013 Monthly Breakdown

May 2012 Processor & End User Program Reimbursements				
<i>Processor</i>	<i>Processor total tons approved</i>	<i>Final processor rate per ton</i>	<i>Total payout for processor</i>	<i>Tire-derived Product Processed</i>
Front Range Tire Recycle	554.80	\$16.31	\$9,048.77	Alternative Daily Cover / Landscape Materials
Geocycle	1,867.00	\$16.31	\$30,450.77	Tire-derived Fuel
Colorado Tire Solutions	378.88	\$16.31	\$6,179.45	Highway Products
Resource Management Company	41.59	\$16.31	\$678.33	Alternative Daily Cover
Haulin Hass	50.82	\$16.31	\$828.87	Tire Bales
<b>Total Processor Payout</b>	<b>2,893.08</b>	<b>\$16.31</b>	<b>\$47,186.20</b>	
<i>End User</i>	<i>End user total tons approved</i>	<i>Final End User Rate Per Ton</i>	<i>Total Payout for End Users</i>	<i>Tire-derived Product End Used</i>
Allied Waste	1,045.52	\$32.62	\$34,104.86	Alternative Daily Cover
Sedgwick County Landfill	41.59	\$32.62	\$1,356.67	Alternative Daily Cover
Holcim	299.00	\$32.62	\$9,753.38	Tire-derived Fuel
Waste Management	538.49	\$32.62	\$17,565.54	Alternative Daily Cover
Colorado Tire Solutions	11.39	\$32.62	\$371.57	Landscape Mulch
<b>Total End User Payout</b>	<b>1,935.99</b>	<b>\$32.62</b>	<b>\$63,152.03</b>	
<b>Total for May 2012</b>	<b>4,829.08</b>	<b>***</b>	<b>\$110,338.23</b>	

June 2012 Processor & End User Program Reimbursements				
<i>Processor</i>	<i>Processor total tons approved</i>	<i>Final processor rate per ton</i>	<i>Total payout for processor</i>	<i>Tire-derived Product Processed</i>
Front Range Tire Recycle	107.30	\$9.09	\$975.33	Alternative Daily Cover / Landscape Materials
Geocycle	1,787.00	\$9.09	\$16,243.83	Tire-derived Fuel
Colorado Tire Solutions	420.00	\$9.09	\$3,817.80	Highway Products
Resource Management Company	20.60	\$9.09	\$187.25	Alternative Daily Cover
<b>Total Processor Payout</b>	<b>2,334.90</b>	<b>\$9.09</b>	<b>\$21,224.21</b>	
<i>End User</i>	<i>End user total tons approved</i>	<i>Final End User Rate Per Ton</i>	<i>Total Payout for End Users</i>	<i>Tire-derived Product End Used</i>
Allied Waste	63.37	\$18.14	\$1,149.53	Alternative Daily Cover
Sedgwick County Landfill	20.60	\$18.14	\$373.68	Alternative Daily Cover
Holcim	3,688.00	\$18.14	\$66,900.32	Tire-derived Fuel
Waste Management	1,929.97	\$18.14	\$35,009.66	Alternative Daily Cover
<b>Total End User Payout</b>	<b>5,701.94</b>	<b>\$18.14</b>	<b>\$103,433.19</b>	
<b>Total for June 2012</b>	<b>8,036.84</b>	<b>***</b>	<b>\$124,657.41</b>	

July 2012 Processor & End User Program Reimbursements				
<i>Processor</i>	<i>Processor total tons approved</i>	<i>Final processor rate per ton</i>	<i>Total payout for processor</i>	<i>Tire-derived Product Processed</i>
Front Range Tire Recycle	118.21	\$14.65	\$1,731.76	Alternative Daily Cover / Landscape Materials
Geocycle	1,656.00	\$14.65	\$24,260.40	Tire-derived Fuel
Colorado Tire Solutions	460.00	\$14.65	\$6,739.00	Highway Products
Resource Management Company	136.63	\$14.65	\$2,001.63	Alternative Daily Cover
Otero County Landfill	247.17	\$14.65	\$3,621.04	Alternative Daily Cover
Hudson Tireville	624.81	\$14.65	\$9,153.47	Alternative Daily Cover
<b>Total Processor Payout</b>	<b>3,242.82</b>	<b>\$14.65</b>	<b>\$47,507.30</b>	
<i>End User</i>	<i>End user total tons approved</i>	<i>Final End User Rate Per Ton</i>	<i>Total Payout for End Users</i>	<i>Tire-derived Product End Used</i>
Allied Waste	432.98	\$29.28	\$12,677.65	Alternative Daily Cover
Sedgwick County Landfill	136.63	\$29.28	\$4,000.53	Alternative Daily Cover
Holcim	1,547.00	\$29.28	\$45,296.16	Tire-derived Fuel
Waste Management	847.87	\$29.28	\$24,825.63	Alternative Daily Cover
Otero County Landfill	247.17	\$29.28	\$7,237.14	Alternative Daily Cover
<b>Total End User Payout</b>	<b>3,211.65</b>	<b>\$29.98</b>	<b>\$94,037.11</b>	
<b>Total for July 2012</b>	<b>6,454.47</b>	<b>***</b>	<b>\$141,544.41</b>	

# Processor & End User Reimbursement Program

Calendar Year 2013 Monthly Breakdown

August 2012 Processor & End User Program Reimbursements				
Processor	Processor total tons approved	Final processor rate per ton	Total payout for processor	Tire-derived Product Processed
Front Range Tire Recycle	1,588.86	\$65.00	\$103,275.90	Alternative Daily Cover / Landscape Materials
Geocycle	2,219.00	\$65.00	\$144,235.00	Tire-derived Fuel
Resource Management Company	65.33	\$65.00	\$4,246.45	Alternative Daily Cover
Otero County Landfill	1,050.14	\$65.00	\$68,259.10	Alternative Daily Cover
Hudson Tireville	1,558.91	\$65.00	\$101,329.15	Alternative Daily Cover
<b>Total Processor Payout</b>	<b>6,482.24</b>	<b>\$65.00</b>	<b>\$421,345.60</b>	
End User	End user total tons approved	Final End User Rate Per Ton	Total Payout for End Users	Tire-derived Product End Used
Allied Waste	1,481.87	\$65.00	\$96,321.55	Alternative Daily Cover
Sedgwick County Landfill	65.33	\$65.00	\$4,246.45	Alternative Daily Cover
Holdim	4,917.00	\$65.00	\$319,605.00	Tire-derived Fuel
Waste Management	1,558.91	\$65.00	\$101,329.15	Alternative Daily Cover
Otero County Landfill	1,050.14	\$65.00	\$68,259.10	Alternative Daily Cover
<b>Total End User Payout</b>	<b>9,073.25</b>	<b>\$65.00</b>	<b>\$589,761.25</b>	
<b>Total for August 2012</b>	<b>15,555.49</b>	<b>***</b>	<b>\$1,011,106.85</b>	

September 2012 Processor & End User Program Reimbursements				
Processor	Processor total tons approved	Final processor rate per ton	Total payout for processor	Tire-derived Product Processed
Front Range Tire Recycle	1,063.16	\$65.00	\$69,105.40	Alternative Daily Cover / Landscape Materials
Geocycle	1,713.00	\$65.00	\$111,345.00	Tire-derived Fuel
Otero County Landfill	981.11	\$65.00	\$63,772.15	Alternative Daily Cover
Hudson Tireville	647.80	\$65.00	\$42,107.00	Alternative Daily Cover
<b>Total Processor Payout</b>	<b>4,405.07</b>	<b>\$65.00</b>	<b>\$286,329.55</b>	
End User	End user total tons approved	Final End User Rate Per Ton	Total Payout for End Users	Tire-derived Product End Used
Allied Waste	928.73	\$65.00	\$60,367.45	Alternative Daily Cover
Sedgwick County Landfill	171.83	\$65.00	\$11,168.95	Alternative Daily Cover
Holdim	1,109.00	\$65.00	\$72,085.00	Tire-derived Fuel
Waste Management	647.80	\$65.00	\$42,107.00	Alternative Daily Cover
Otero County Landfill	981.11	\$65.00	\$63,772.15	Alternative Daily Cover
Morwal Dairy	272.73	\$65.00	\$17,727.45	Tire Bales (windbreakers)
<b>Total End User Payout</b>	<b>4,111.20</b>	<b>\$65.00</b>	<b>\$267,228.00</b>	
<b>Total for September 2012</b>	<b>8,516.27</b>	<b>***</b>	<b>\$553,557.55</b>	

October 2012 Processor & End User Program Reimbursements				
Processor	Processor total tons approved	Final processor rate per ton	Total payout for processor	Tire-derived Product Processed
Front Range Tire Recycle	1,100.37	\$65.00	\$71,524.05	Alternative Daily Cover / Landscape Materials
Geocycle	2,591.00	\$65.00	\$168,415.00	Tire-derived Fuel
Hudson Tireville	202.14	\$65.00	\$13,139.10	Alternative Daily Cover
<b>Total Processor Payout</b>	<b>3,893.51</b>	<b>\$65.00</b>	<b>\$253,078.15</b>	
End User	End user total tons approved	Final End User Rate Per Ton	Total Payout for End Users	Tire-derived Product End Used
Allied Waste	1,048.44	\$65.00	\$68,148.60	Alternative Daily Cover
Sedgwick County Landfill	71.50	\$65.00	\$4,647.50	Alternative Daily Cover
Holdim	2,746.00	\$65.00	\$178,490.00	Tire-derived Fuel
Waste Management	202.14	\$65.00	\$13,139.10	Alternative Daily Cover
Morwal Dairy	854.26	\$65.00	\$55,526.90	Tire Bales (windbreakers)
<b>Total End User Payout</b>	<b>4,922.34</b>	<b>\$65.00</b>	<b>\$319,952.10</b>	
<b>Total for October 2012</b>	<b>8,815.85</b>	<b>***</b>	<b>\$573,030.25</b>	

# Processor & End User Reimbursement Program

Calendar Year 2013 Monthly Breakdown

November 2012 Processor & End User Program Reimbursements				
<i>Processor</i>	<i>Processor total tons approved</i>	<i>Final processor rate per ton</i>	<i>Total payout for processor</i>	<i>Tire-derived Product Processed</i>
Front Range Tire Recycle	922.41	\$65.00	\$59,956.65	Alternative Daily Cover / Landscape Materials
Geocycle	2,276.00	\$65.00	\$147,940.00	Tire-derived Fuel
Hudson Tireville	225.17	\$65.00	\$14,636.05	Alternative Daily Cover
Resource Management Company	115.82	\$65.00	\$7,528.30	Alternative Daily Cover / Silage Covers
<b>Total Processor Payout</b>	<b>3,539.40</b>	<b>\$65.00</b>	<b>\$230,061.00</b>	
<i>End User</i>	<i>End user total tons approved</i>	<i>Final End User Rate Per Ton</i>	<i>Total Payout for End Users</i>	<i>Tire-derived Product End Used</i>
Allied Waste	851.24	\$65.00	\$55,330.60	Alternative Daily Cover
Sedgwick County Landfill	109.44	\$65.00	\$7,113.60	Alternative Daily Cover
Holcim	897.00	\$65.00	\$58,305.00	Tire-derived Fuel
Waste Management	225.17	\$65.00	\$14,636.05	Alternative Daily Cover
Morwai Dairy	1,092.22	\$65.00	\$70,994.30	Tire Bales (windbreakers)
<b>Total End User Payout</b>	<b>3,175.07</b>	<b>\$65.00</b>	<b>\$206,379.55</b>	
<b>Total for November 2012</b>	<b>6,714.47</b>	<b>***</b>	<b>\$436,440.55</b>	

December 2012 Processor & End User Program Reimbursements				
<i>Processor</i>	<i>Processor total tons approved</i>	<i>Final processor rate per ton</i>	<i>Total payout for processor</i>	<i>Tire-derived Product Processed</i>
Front Range Tire Recycle	708.50	\$65.00	\$46,052.50	Alternative Daily Cover / Landscape Materials
Geocycle	1,712.00	\$65.00	\$111,280.00	Tire-derived Fuel
Hudson Tireville	196.85	\$65.00	\$12,795.25	Alternative Daily Cover
Resource Management Company	59.78	\$65.00	\$3,885.70	Alternative Daily Cover
<b>Total Processor Payout</b>	<b>2,677.13</b>	<b>\$65.00</b>	<b>\$174,013.45</b>	
<i>End User</i>	<i>End user total tons approved</i>	<i>Final End User Rate Per Ton</i>	<i>Total Payout for End Users</i>	<i>Tire-derived Product End Used</i>
Allied Waste	651.93	\$65.00	\$42,375.45	Alternative Daily Cover
Sedgwick County Landfill	59.78	\$65.00	\$3,885.70	Alternative Daily Cover
Waste Management	196.85	\$65.00	\$12,795.25	Alternative Daily Cover
Morwai Dairy	914.81	\$65.00	\$59,462.65	Tire Bales (windbreakers)
Konig Land & Cattle	67.00	\$65.00	\$4,355.00	Tire Bales (windbreakers)
<b>Total End User Payout</b>	<b>1,890.37</b>	<b>\$65.00</b>	<b>\$122,874.05</b>	
<b>Total for December 2012</b>	<b>4,567.50</b>	<b>***</b>	<b>\$296,887.50</b>	

## Registered Waste Tire Facilities and Haulers - 2012 Annual Report Map of Waste Tire Haulers and Facilities in Colorado Monofills

Business Name	DBA Name	Location Address	Location City/State/Zip
Colorado Energy Recyclers/GCC Rio Grande		19755 Boca Raton Heights Road	Fountain, CO 80817
Hudson Tireville Operations Company, LLC		12311 Weld County Rd 41	Hudson, CO 80642
Resource Management Company, Inc.		16498 County Road 34	Julesburg, CO 80737
<b>Waste Tire Processors</b>			
Business Name	DBA Name	Location Address	Location City/State/Zip
3M Grinding and Compost LLC		59373 Banner Rd.	Olatha, CO 81425
Ace in Your Pocket, Inc		2515 Chico St	Alamosa, CO 81101
American Tire Exchange, Inc.		740 Babcock Road	Colorado Springs, CO 80915
American Tire Recycling, LLC		5101 Columbine Street	Denver, CO 80216
Colorado Tire Solutions, Inc.		4549 Desert Varnish Dr.	Colorado Springs, CO 80922
Delta County - Adobe Buttes Landfill		12211 Trap Club Road	Eckert, CO 81418
Geocycle, LLC		1170 Transit Dr	Colorado Springs, CO 80903
Haulin Hass Tire Recycling LLC		9540 COUNTY RD 201	LIMON, CO 80828
Hudson Tireville Operations Company, LLC		12311 Weld County Rd 41	Hudson, CO 80642
Mesa County Landfill	Mesa County Solid Waste Division	3071 Hwy 50	Grand Junction, CO 81503
Moffat County Municipal Solid Waste Landfill		1806 County Road 107 North	Craig, CO 81625
Otero County Landfill		21250 County Road 21	Rocky Ford, CO 81067
Overton Recycling		1256 Cleveland	Meeker, CO 81641
Recycled Fuel LLC		2665 Durango Drive	Colorado Springs, CO 80910
Resource Management Company, Inc.		16498 County Road 34	Julesburg, CO 80737
RIO BLANCO COUNTY GOVERNMENT	WRAY GULCH SOLID WASTE LANDFILL	1496 COUNTY ROAD 72	MEEKER, CO 81641
Snowy River Enterprises		4450 Mulligan Dr	Longmont, CO 80504
South Canyon Solid Waste Disposal Site	South Canyon Landfill	1205 County Road 134	Glenwood Springs, CO 81601
The Helping Hand		1418 Q Road	Loma, CO 81524
Tire Tech L.L.C.		110 River Frontage Rd	Silt, CO 81662
Used Tire Exchange, Inc.	Front Range Tire Recycle, Inc.	5765 N. Peterson Road	Sedalia, CO 80135
WEST GARFIELD COUNTY LANDFILL		0075 COUNTY ROAD 246A	RIFLE, CO 81650
<b>End Users</b>			
Business Name	DBA Name	Location Address	Location City/State/Zip
ACADEMY SPORTS TURF, LLC		3740 S. JASON ST.	ENGLEWOOD, CO 80110
American Tire Exchange, Inc.		740 Babcock Road	Colorado Springs, CO 80915
BFI Waste Systems of North America	Allied Waste Systems - Tower Rd Landfill	8480 Tower Rd	Commerce City, CO 80022
BFI Waste Systems of North America	Allied Waste Systems - Foothills Landfill	8900 Hwy 93	Golden, CO 80403
CHILD'S PLAY OF COLORADO		9956 W. REMINGTON PLACE, STE A-10-186	LITTLETON, CO 80128
Colorado Tire Solutions, Inc.		4549 Desert Varnish Dr.	Colorado Springs, CO 80922
Delta County - Adobe Buttes Landfill		12211 Trap Club Road	Eckert, CO 81418
EZ PLAY SURFACES LLC		8156 S. WADSWORTH BLVD, STE 205	LITTLETON, CO 80218
FRANK SILVA		18494 WCR 39	LASALLE, CO 80645
GH DANIELS & ASSOCIATES		140 GH DANIELS BLVD	GYPSUM, CO 81637

## End Users - Continued

Business Name	DBA Name	Location Address	Location City/State/Zip
Green Earth Environmental Incorporated		1760 Broad Street	Milliken, CO 80543
Greg Delgado		32956 River Frontage Rd	Silt, CO 81652
Holcim (US) Inc. - Portland Plant		3500 State Highway 120	Florence, CO 81226
Konig Land and Cattle		57851 WCR 81	Grover, CO 80729
Mesa County Government	Department of Parks, Landscape and Open Spaces	315 North Spruce	Grand Junction, CO 81501
Mesa County Landfill	Mesa County Solid Waste Division	3071 Hwy 50	Grand Junction, CO 81503
Moffat County Municipal Solid Waste Landfill		1806 County Road 107 North	Craig, CO 81625
MORWAY DAIRY, LLC		19999 WCR 28	HUDSON, CO 80642
Otero County Landfill		21250 County Road 21	Rocky Ford, CO 81067
Recycled Fuel LLC		2685 Durango Drive	Colorado Springs, CO 80910
RIO BLANCO COUNTY GOVERNMENT	WRAY GULCH SOLID WASTE LANDFILL	1496 COUNTY ROAD 72	MEEKER, CO 81641
Rubberston, Inc.		5765 N. Patterson Rd	Sedalia, CO 80135
Sedgwick County Landfill		13901 US Hwy 385	Julesburg, CO 80737
South Canyon Solid Waste Disposal Site	South Canyon Landfill	1205 County Road 134	Glenwood Springs, CO 81601
Town of New Castle Public Works		801 W. Main Street	New Castle, CO 81647
Waste Management of Colorado, Inc. - Denver Arapahoe Disposal Site		3500 S. Gun Club Road	Aurora, CO 80018

## Waste Tire Collection Facilities

Business Name	DBA Name	Location Address	Location City/State/Zip
Chaffee County Waste Disposal		16550 Hwy 285	Salida, CO 81201
CITY OF LAS ANIMAS		532 CARSON AVENUE	LAS ANIMAS, CO 81054
City of Trinidad Landfill		2401 N. State Street	Trinidad, CO 81082
Custer County Landfill		2250 County Road 328	Westcliffe, CO 81252
EAGLE COUNTY SOLID WASTE & RECYCLING	EAGLE COUNTY LANDFILL	815 UTE CREEK ROAD	WOLCOTT, CO 81655
Gunnison County Landfill		621 County Road 42	Gunnison, CO 81230
KIT CARSON COUNTY LANDFILL		19555 COUNTY ROAD 46	BURLINGTON, CO 80807
Lake County Landfill	Lake County Government	1500 County Road 6	Leadville, CO 80461
Larimer County Solid Waste	Larimer County Landfill	5887 S. Taft Hill Rd.	Fort Collins, CO 80526
Lincoln County		27510 County Road 3E	Genoa, CO 80818
Logan County Landfill		24235 E. HWY 6	Sterling, CO 80751
MONTEZUMA COUNTY LANDFILL		26100 ROAD F	CORTEZ, CO 81321
MORGAN COUNTY LANDFILL	MORGAN COUNTY SOLID WASTE MANAGEMENT DEPT	21448 MORGAN COUNTY ROAD 22	FORT MORGAN, CO 80701
Otero County Landfill		21250 County Road 21	Rocky Ford, CO 81067
Phillips County Landfill		22736 Co Rd 29	Holyoke, CO 80734
Pitkin County Resource Recovery		32046 Highway 82	Snowmass Village, CO 81615
RIO BLANCO COUNTY GOVERNMENT	WRAY GULCH SOLID WASTE LANDFILL	1496 COUNTY ROAD 72	MEEKER, CO 81641
San Luis Valley Regional Solid Waste Authority	Regional Landfill	1600 C R 44	Monte Vista, CO 81144
Sedgwick County Landfill		13901 US Hwy 385	Julesburg, CO 80737
South Canyon Solid Waste Disposal Site	South Canyon Landfill	1205 County Road 134	Glenwood Springs, CO 81601
TWIN LANDFILL CORP. - MILNER LANDFILL	MILNER LANDFILL	20650 COUNTY RD #205	STEAMBOAT SPRINGS, CO 81487
TWIN LANDFILL CORP OF FREMONT COUNTY - PHANTOM LANDFILL	PHANTOM LANDFILL	2500 FREMONT COUNTY ROAD #67	PENROSE, CO 81240
WEST GARFIELD COUNTY LANDFILL		0075 COUNTY ROAD 246A	RIFLE, CO 81650
Yuma County Sanitary Landfill		15738 Co Rd 34	Eckley, CO 80759

## Waste Tire Haulers

Business Name	DBA Name	Location Address	Location City/State/Zip
Used Tire Exchange, Inc.	Front Range Tire Recycle, Inc.	5765 N. Peterson Road	Sedalia, CO 80135
Resource Management Company, Inc.		16498 County Road 34	Julesburg, CO 80737
Snowy River Enterprises		4450 Mulligan Dr	Longmont, CO 80504
American Tire Exchange, Inc.		740 Babcock Road	Colorado Springs, CO 80915
Geocycle, LLC		1170 Transit Dr	Colorado Springs, CO 80903
Haulin Hass Tire Recycling LLC		9540 COUNTY RD 201	LIMON, CO 80828
Premier Tire Terminal, Inc.		4650 Steele St	Denver, CO 80216
Fred C. Mathews, Jr.		1767 Porter Creek Ln	Pueblo West, CO 81007
WWF Incorporated		145 14th St	Fl. Lupton, CO 80621
Mike's Top Spot Tires		2011 EAST 4TH ST	PUEBLO, CO 81001
Jim's Tire Service		1005 SOUTH 9TH ST	CANON CITY, CO 81212
Trails End Tire Removal	Trails End Tire Removal/Tire Recycling	121 BUNYON	BERTHOUD, CO 80513
IFactor LLC		19145 WCR 2	BRIGHTON, CO 80603
Just Like the Master (JLM)		472 Meadows Drive	Pagosa Springs, CO 81147
Arkansas Valley Alfalfa Milling Company		35590 US Hwy 287	Wiley, CO 81092
Busse Trucking		225 Granite Rd	Granby, CO 80446
VAIL RESORTS	BEAVER CREEK FLEET MANAGEMENT	8400 DALLY RD	AVON, CO 81658
MY TIRE LLC		6169 BRENTWOOD ST	ARVADA, CO 80004
Bridgestone Americas Tire Operations, LLC	TDS Tires, Inc (Tire Distribution Systems, Inc.)	4363 State Highway 66	Longmont, CO 80504
Rocky Ford Discount Tire Co, Inc.		1601 Elm Ave.	Rocky Ford, CO 81067
ALPINE DISPOSAL	ALPINE WASTE & RECYCLING	7475 E 84TH AVE	COMMERCE CITY, CO 80220
BRIDGESTONE AMERICA TIRE OPERATION	TIRE DISTRIBUTION SYSTEMS	794 22ND RD	GRAND JUNCTION, CO 81505
The Helping Hand		1418 Q Road	Loma, CO 81524
Wingfoot Commercial Tire Systems		621 A Street	Greeley, CO 80631
Wingfoot Commercial Tire Systems		3108 N. Stone Ave	Colorado Springs, CO 80907
Aragon Iron & Metal, Corp.		516 N US HWY 287	Fort Collins, CO 80524
NEBRASKALAND	COLORADOLAND TIRE AND SERVICE	6995 N BROADWAY	DENVER, CO 80221
TIRE CENTERS, LLC	TCI TIRE CENTERS #785	9156 BRIGHTON RD	HENDERSON, CO 80640
TIRE CENTERS, LLC	TCI TIRE CENTERS #795	3147 CENTURY STREET	COLORADO SPRINGS, CO 80907
TIRE CENTERS, LLC	TCI TIRE CENTERS #797	3428 ASTROZON BLVD	COLORADO SPRINGS, CO 80910
TIRE CENTERS, LLC	TCI TIRE CENTERS #806	22303 I-76 FRONTAGE RD	HUDSON, CO 80642
MODEL TIRE STORE	MODEL TIRE STORE	1162 MAIN	DURANGO, CO 81301
ROCKY MOUNTAIN RECYCLING, INC		6510 BRIGHTON BLVD	COMMERCE CITY, CO 80022
TRANSWEST TRUCKS	TRANSWEST BUICK GMC	7626 BRIGHTON RD	BRIGHTON, CO 80022
RC TIRE DISPOSAL		6410 CHURCH RD	OLATHE, CO 81425
H & H RETREADING		4183 CHERRYVALE DRIVE	COLORADO SPRINGS, CO 80918
A & E Tire, Inc.		3855 E. 52nd Avenue	Denver, CO 80216
Liberty Tire Services of Ohio, LLC	Liberty Tire Recycling, LLC	1398 North Beck Street	Salt Lake City, UT 84116
Heartland Environmental Services LLC	Pitkin County Waste Systems LLC South Canyon Waste Systems LL	32046 HWY 82	Snowmass Village, CO 81615
GCR/TDS TIRES	GCR TIRE CENTERS	200 GREAT WESTERN ROAD	BRIGHTON, CO 80601
BRIDGESTONE AMERICAS TIRE OPERATION	TIRE DISTRIBUTION SERVICES	2220 RAND AVENUE	COLORADO SPRINGS, CO 80906
BRIDGESTONE AMERICAS TIRE OPERATIONS	TDS AND GCR TIRES	5125 E. 58TH PLACE	COMMERCE CITY, CO 80022
Bridgestone Americas Tire Operations, LLC.	TIRE Distribution Systems	12000 W. 44th Avenue	Wheat Ridge, CO 80033
CITY OF LAS ANIMAS		532 CARSON AVENUE	LAS ANIMAS, CO 81054

### Waste Tire Haulers - Continued

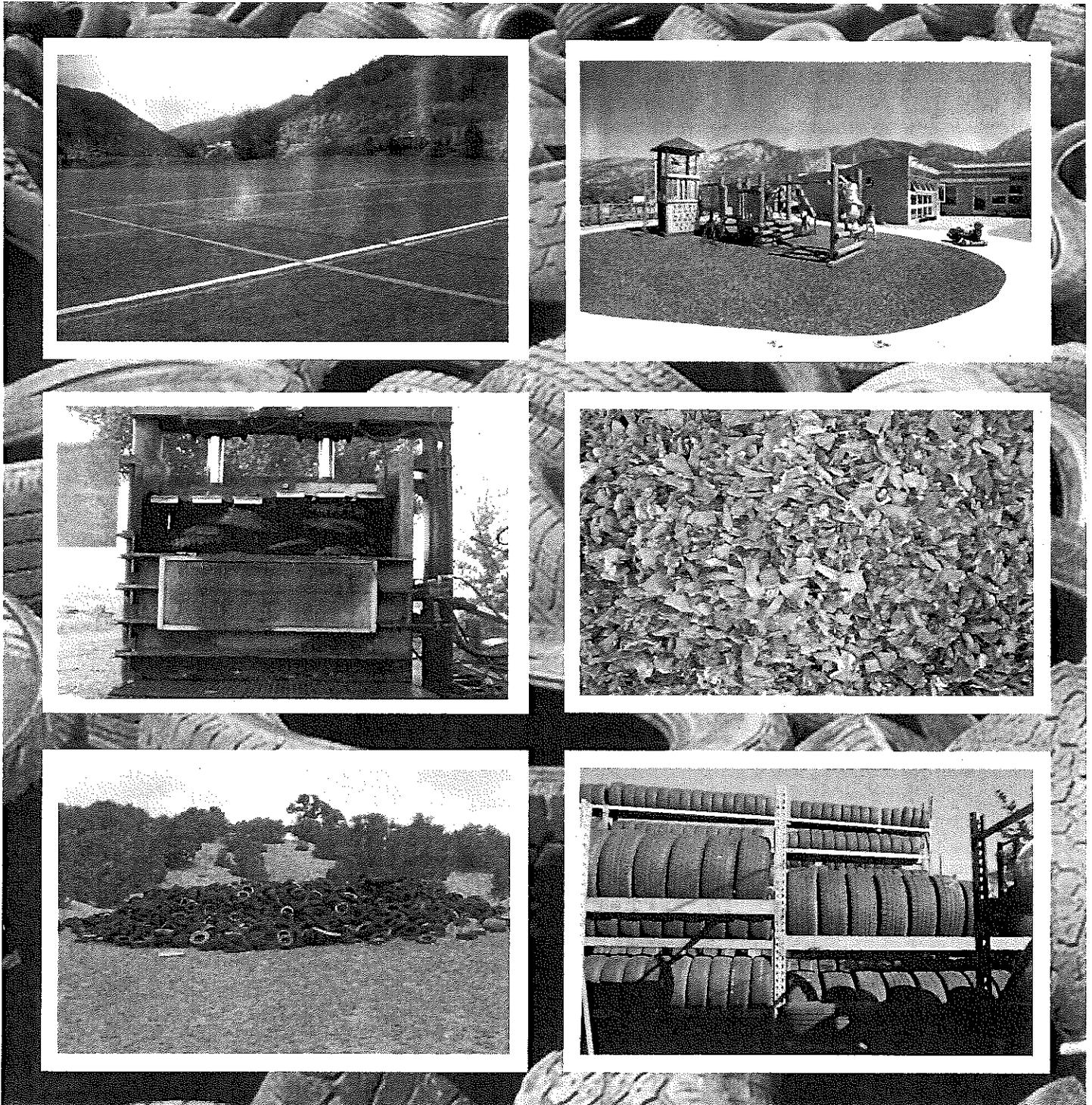
Business Name	DBA Name	Location Address	Location City/State/Zip
LANTERA EL REY, LLC		11151 E COLFAX AVE	AURORA, CO 80010
DOUGLAS COUNTY Gunnison County Landfill		3030 INDUSTRIAL WAY 621 County Road 42	CASTLE ROCK, CO 80109 Gunnison, CO 81230
LEO E. PORTER		17775 HWY 26	OSHKOSH, NE 68154
ECO MIND TIRE RECYCLING AND DISPOSAL INC		2105 S. SHERIDAN BLVD	DENVER, CO 80227
COLORADO TIRE HAULERS		2929 MATTHEWS AVE	FORT LUPTON, CO 80621
TIRES INTERNATIONAL, INC.		6125 PORTER WAY	COMMERCE CITY, CO 80022
GALLEGOS SANITATION INC		1941 HEATH PARKWAY	FORT COLLINS, CO 80524
TDS/BRIDGESTONE AMERICA TIRE OPERATION LLC		5000 COLORADO BLVD	DENVER, CO 80216
Bridgestone Americas Tire Operations, LLC	GCR TDS /Tire Distribution Systems	1247 East Highway 40	Craig, CO 81625
Overton Recycling		1256 Cleveland	Meeker, CO 81641
Colorado Tire Recycling, LLC		5101 Columbine	Denver, CO 80216
CDOT - Sterling East Maintenance		12852 CR 370	Sterling, CO 80751
CDOT - Superior Maintenance		7250 Marshall Rd	Superior, CO 80027
CDOT - Wellington Maintenance		4421 E. County Road 70	Wellington, CO 80549
CDOT - Wray Maintenance		30137 Highway 34	Wray, CO 80758
CDOT - Yuma Maintenance		5053 CR 37	Yuma, CO 80759
CDOT - Brush Maintenance		29340 Highway 34	Brush, CO 80723
CDOT - Fort Collins (New) Maintenance		602 Lindon St.	Fort Collins, CO 80524
CDOT - Fort Lupton Maintenance		350 WCR 14 1/2	Ft. Lupton, CO 80621
CDOT - Dacomo Maintenance		6075 I-25 Frontage Rd.	Dacomo, CO 80516
CDOT - Greeley East Maintenance		23500 Highway 263	Greeley, CO 80631
CDOT - Greeley West Maintenance		10601 Highway 34	Greeley, CO 80634
CDOT - Holyoke Maintenance		1044 S. Inter Ocean	Holyoke, CO 80734
CDOT - Julesburg Maintenance		20495 CR 28	Julesburg, CO 80737
CDOT - Loveland Maintenance		2207 E. Highway 402	Loveland, CO 80537
CDOT - Mead Maintenance		4349 Mulligan St.	Mead, CO 80542
OZZIES COMMERCIAL TIRES		3940 CARSON AVE #2	EVANS, CO 80620
CJO ENTERPRISES, INC	HI GRADE RECYCLING	4155 US HWY 6	GYP SUM, CO 81637
Chapman's Automotive Service Center Inc.		310 E. Victory Way	Craig, CO 81625
David's Tire Recycling		1300 N. Click	Nevada, MO 64772
Lakin Tire West, Inc.		510 E. 51st Ave.	Denver, CO 80216
Intrawest LLC		19775 Industry Ave	Fountain, CO 80817
FLAVIO CORRAL		110 RIVER FRONTAGE RD	SILT, CO 81625
RE-TYRES, LLC		6045 E. 76TH AVE UNIT 3	COMMERCE CITY, CO 80022
PRODUCERS CO-OP		430 5TH STREET	OLATHE, CO 81425
Champlin Tire Recycling, Inc.		301 Cedar Street	Concordia, KS 66901
BRIDGESTONE AMERICAS TIRE OPERATIONS	GCR/TDS	4500 E 51ST AVE	DENVER, CO 80216
BRIDGESTONE AMERICAS TIRE OPERATIONS	GCR/TDS	3020 E MULBERRY	FORT COLLINS, CO 80524
BRIDGESTONE AMERICAS TIRE OPERATIONS	GCR/TDS	1985 2ND AVE	GREELEY, CO 80631
FAKLER TRANSPORTATION, INC.		3460 KIMBALL CIRCLE	COLORADO SPRINGS, CO 80910



Colorado Department  
of Public Health  
and Environment

# Status of Waste Tire Recycling in Colorado

## 2012 Annual Report to the Transportation Legislation Review Committee



# Executive Summary

Calendar year 2012 marks the ninth year the Colorado Department of Public Health and Environment (the department) has compiled data related to the number of waste tires collected at waste tire processing, collection and storage facilities and by waste tire haulers and end users in Colorado and the status of Colorado's Waste Tire Program. Waste tire processing facilities continue to process tires into different tire-derived products that are used as tire-derived fuel, as alternative daily cover at solid waste landfills and as fencing and windbreaks, among others. Tires stored in monofills will be reused at a later date for various tire-derived products, including tire-derived fuel. The second largest monofill has obtained the necessary permits to process tire shreds, or tire chips, for use as fuel to power a cement kiln. Additionally, the Colorado Waste Tire Program passed two sets of updated regulations in 2012 regarding waste tire management and implementation of the waste tire

processor and end user reimbursement fund.

This 2012 calendar year annual report on waste tire recycling in Colorado is being transmitted to the Transportation Legislation Review Committee as required by House Bill 04-1428 and section 25-17-202.7, C.R.S. The statute requires the department to issue a report to the Transportation Legislation Review Committee on or before July 1st each year that includes the total number of waste tires recycled in the state. This information is submitted to the department pursuant to the Regulations Pertaining to Solid Waste Sites and Facilities (6 CCR 1007-2, Sections 10.3.6, 10.5.7, 10.6.7 and 10.7.7).

The department gathers this information through annual reporting from waste tire processing, collection and storage facilities and waste tire haulers and end users. The department continued outreach efforts to educate waste tire operators regarding their compliance and reporting responsibilities.



## Colorado Department of Public Health and Environment Hazardous Materials and Waste Management Division Solid Waste and Materials Management Program

### Report Authors and Technical Assistance:

Shana Baker, Environmental Protection Specialist  
Nick Boudreau, Environmental Protection Specialist  
Brian Gaboriau, Waste Tire Grants Administrator  
Katherine Lemon, Public Information Specialist  
Charles G. Johnson, Solid Waste and Materials  
Management Program Manager

For additional information or copies:  
Charles G. Johnson,  
CDPHE HMWMD-B2  
4300 Cherry Creek Drive South  
Denver, CO 80246-1530  
(303) 692-3348

### 2012-2013 Waste Tire Advisory Committee Member Representatives

- James (Jim) Reid (Local Fire Authorities and Committee Chairman)
- Joel Bolduc (Waste Tire End Users)
- Larry Hudson (Tire Manufacturers)
- Trent Peterson (Waste Tire Monofills)
- Michael (Scott) Skorka (Tire Retailers)
- Christopher (Chris) Houtchens (Waste Tire Haulers and Committee Vice-Chairman)\*
- Cyrus (Rusty) Hardy (Law Enforcement)
- Charles Johnson (Colorado Department of Public Health and Environment)
- Richard (Rick) Welle (Waste Tire Processors)

\*Resigned from Committee effective 6/6/2013

Cover Photos (clockwise from top-right):

Soccer/baseball field made from waste tires installed as a base layer, playground made from waste tires installed as a base layer, tire baler in the process of baling waste tires, tire shreds used as alternative daily cover, illegal pile of waste tires, new and resale salvage tires

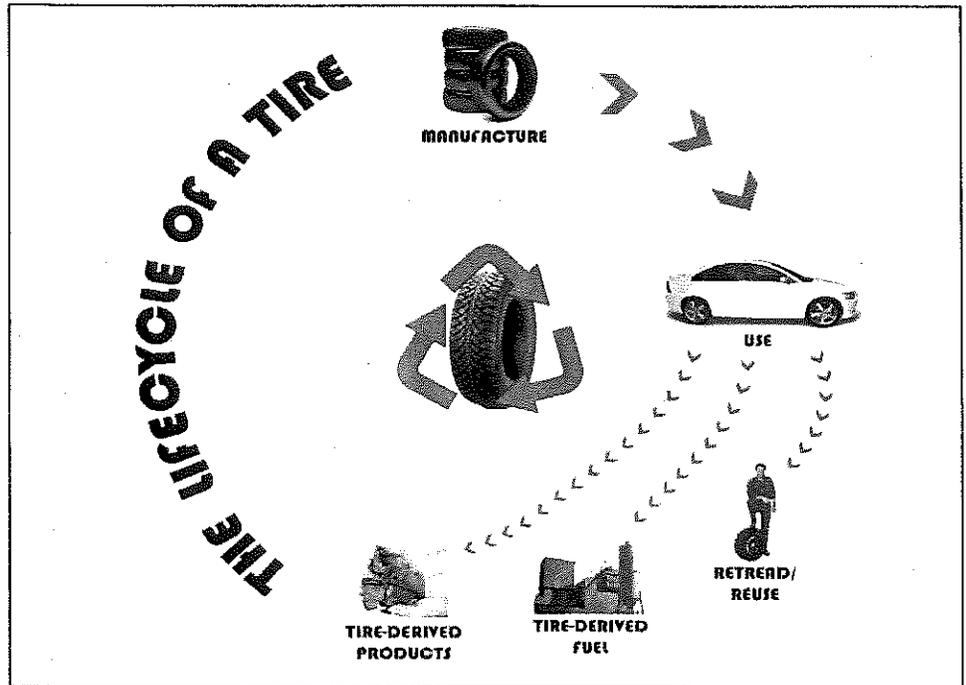
# Waste Tire Update

Data submitted to the department by waste tire facilities (waste tire processing, end using and collection facilities and waste tire monofills) and waste tire haulers indicates there were 5,117,019 waste tires generated in the state of Colorado during calendar year 2012. Considering Colorado's latest census population estimate of 5,187,582 people, this rate of waste tires generated is slightly less than the accepted nationwide industry standard that predicts a waste tire generation rate of one waste tire/person/year.

A total of 230,270 of the 5,117,019 waste tires generated in Colorado in 2012 were hauled to a recycling facility in Utah for processing and 3,524 waste tires were transported to a waste tire monofill in Kansas and a landfill in New Mexico that accepts waste tires. Conversely, 432,933 waste tires were shipped to Colorado waste tire facilities from out-of-state sources.

Colorado waste tire processors and a Utah-based waste tire processing facility that processed Colorado-generated tires recycled a total of 5,687,804 waste tires in 2012. This corresponds to a 111 percent recycling rate, with all of the tires generated in 2012 by Colorado sources being recycled. This figure is consistent with the 100 percent recycling rate of Colorado generated waste tires achieved in 2011.

A 111 percent recycling rate indicates that processing facilities in Colorado and a surrounding state processed a number of tires equivalent to the number of waste tires generated in Colorado. These processors also had the capacity to recycle 103 percent of



*The lifecycle of a tire from the point of manufacturing, use and reuse/recycling*

the total number of tires generated in Colorado plus those sent to Colorado from states to the east and northeast (5,549,952 total tires).

Figure 1 (Page 6) provides an annual comparison of Colorado's waste tire recycling rates for the last nine years. The waste tire recycling rates remained relatively consistent each year until 2009 when the recycling rate moved up sharply to levels above 90 percent. This increase can be attributed to more accurate data collection methods, identification of an out-of-state recycler of Colorado tires and an increase of tires used as tire-derived fuel and alternate daily cover.

Figure 2 (Page 6) captures the top 10 end use markets for waste tires recycled during calendar year 2012. Of the 10 end use markets identified, the top five included the processing of waste tires to be used as: 1).

tire-derived fuel by cement kilns; 2). tire shreds as alternative daily cover at solid waste landfills; 3). resale of salvage tires for reuse or retreading; 4). tire bales as fencing and windbreaks; 5). waste tires processed into crumb rubber for use in roadways and molded rubber products.

Figure 3 (Page 6 and 7) reflects the number of waste tires in storage at registered waste tire facilities statewide at the end of calendar year 2012. The on-site waste inventory decreased by 462,294 tires during the year. As of 2012, 60,400,487 waste tires were stored in tire monofills while 645,872 waste tires were stored temporarily at waste tire processing and collection facilities.

In general, in 2012 a majority of waste tire processing and collection facilities decreased their storage inventory by

*Continued on next page...*

# Waste Tire Update

*Continued from previous page...*

increasing waste tire processing rates or shipping tires offsite for processing into tire-derived product. Figure 4 (Page 7) illustrates the amount of waste tires recycled. In 2011, 5,097,944 tires went to end use markets. In 2012, that figure grew to 5,687,804, a 10 percent increase in the number of tires going to end use markets. The number of tires going to end use markets increased by 6.8 percent in 2010 and by 12 percent in 2011. This increase represents a continuing trend of more waste tires going to end use markets within and

---

*'In 2012, the number of waste tires going to end use markets grew to 5,687,804, a 10 percent increase over 2011.'*

---

outside of Colorado.

By contrast, Figure 5 (Page 7) describes a further decline in the number of waste tires added to waste storage inventories in 2012. During 2009, 572,121 waste tires entered the waste tire storage

inventory. There was an increase to 604,151 tires in 2010, with a decline in 2011 with only 69,452 tires entering storage inventories. The department observed a steep decline in 2012 with no additional waste tires entering waste tire storage inventories due to the removal of waste tires from one monofill and temporary storage at processing and collection facilities and tires processed into tire-derived product for end use.

## Regulatory Authority and Program Elements

The department's Solid Waste and Materials Management Program, located within the Hazardous Materials and Waste Management Division, and the Division of Environmental Health and Sustainability are responsible for overseeing the Waste Tire Program.

The Solid Waste and Materials Management Program is responsible for ensuring compliance with laws and regulations pertaining to waste tire management and administers the waste tire fire prevention and law enforcement grant funds. The Division of Environmental Health and Sustainability Waste Tire Program provides funding for the reuse or recycling of waste tires generated in Colorado through the processor and end user, recycling incentives,

illegal waste tire cleanup and waste tire market development grant funds.

The Waste Tire Program receives no monies from Colorado's General Fund and is 100 percent fee supported. Senate Bill 09-289 changed how the Colorado Department of Revenue collects the \$1.50 tire fee to support the Waste Tire Program, shifting collection to each new tire sold in Colorado rather than collecting the fee at the disposal point.

House Bill 10-1018 allocated funding from the \$1.50 fee to cover program staff and administrative costs and appropriated a percentage of the fee to cover the five department-administered grant funds:

- Processor and End User Fund: Funding for waste tire processors and end

users to encourage the use of waste tires.

- Waste Tire Cleanup Fund: Provides grants to counties and municipalities for the removal of illegally disposed waste tires.
- Waste Tire Market Development Fund: To develop markets for waste tires.
- Waste Tire Fire Prevention Fund: Provides grants to fire agencies to purchase tire fire equipment and supplies and fund training.
- Law Enforcement Grant: Grants to law enforcement, fire agencies and local health departments for waste tire enforcement/oversight.

# Waste Tire Grants

## Waste Tire Cleanup Fund

The Waste Tire Cleanup Fund provides funding for the cleanup of illegal or abandoned waste tire sites and offers incentives to use waste tires in public projects. Funds are split two-thirds for cleanup and one-third for incentives.

Counties and municipalities may apply for funding year round. The department works with counties and municipalities to ensure the site fits the definition of "illegal" or "abandoned" waste tires.

Thirteen waste tire cleanups in four counties and one municipality were completed in 2012. The total cost was \$424,974 with a total of 197,129 illegal or abandoned waste tires removed (see chart below). Cleanup project costs can vary among sites depending on where the cleanup site is located, the site's topography and if tires are above ground or buried.

Grantee Name	Funds Spent for Cleanup	Tires Removed
City of Pueblo	\$76,680	20,000
Douglas County	\$8,510	839
Otero County	\$205,061	117,000
Fremont County (5 grants, 4 sites)	\$30,973	10,670
El Paso County (5 grants, 3 sites)	\$103,750	48,620
Total:	\$424,974	197,129

## Processor & End User Fund

Funds for the use of waste tire-derived products are available to both processors and end users. Monthly reimbursements are based on approved tons and available funding.

For 2012, \$3,801,053 was reimbursed for 38,142 processed approved tons and 47,892 end used approved tons.

The passage of House Bill 12-1034 in May 2012 changed the eligibility requirements for processors and end users. Processors are now eligible for reimbursements when the processed waste tires are made into a tire-derived product and the processor has end used the tire-derived product themselves or the tire-derived product has been sold for an end use and moved off-site. An end user is now defined as a person who uses a tire-derived product for a commercial or industrial purpose.

*'Thirteen waste tire cleanups in four counties and one municipality were completed in 2012. The total cost was \$424,974 with a total of 197,129 illegal or abandoned waste tires removed.'*

## Recycling Incentives

The Waste Tire Cleanup Fund also incentivizes the use of Colorado waste tires in public projects to promote tire-derived products around the state. Projects include playground surfacing, athletic fields and infill for existing recycled turf surfaces.

During 2012, eight recycling incentive grants in seven counties were completed. The total amount awarded was \$330,994, using 44,788 waste tires (see chart below).

Organization	Funds Spent on Project	Tires Used (approx.)
Jefferson County Public Schools	\$50,000	4,320
Elbert County School District C-2	\$8,100	864
South Suburban Park and Recreation District	\$49,280	13,689
Town of Calhan	\$50,000	5,511
Phillips County	\$44,400	3,022
Frontier Charter Academy	\$42,884	4,622
Academy School District 20	\$36,330	4,031
City of Evans	\$50,000	8,729
Total:	\$330,994	44,788

# By the Numbers: Overview of Colorado's Waste

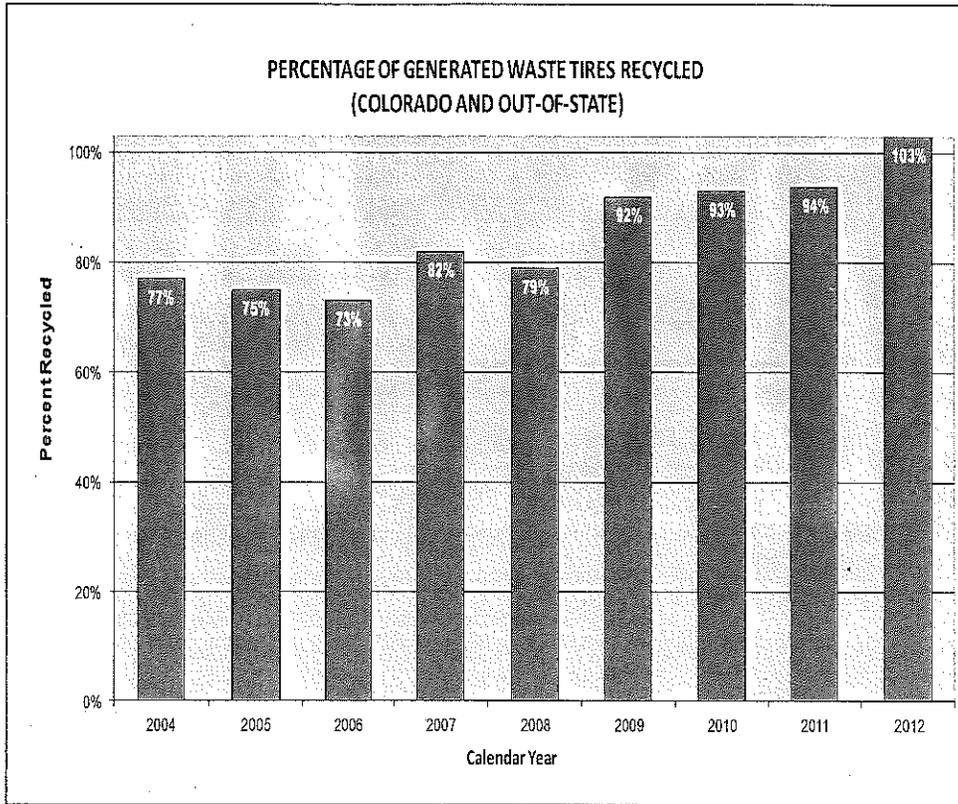


Figure 1

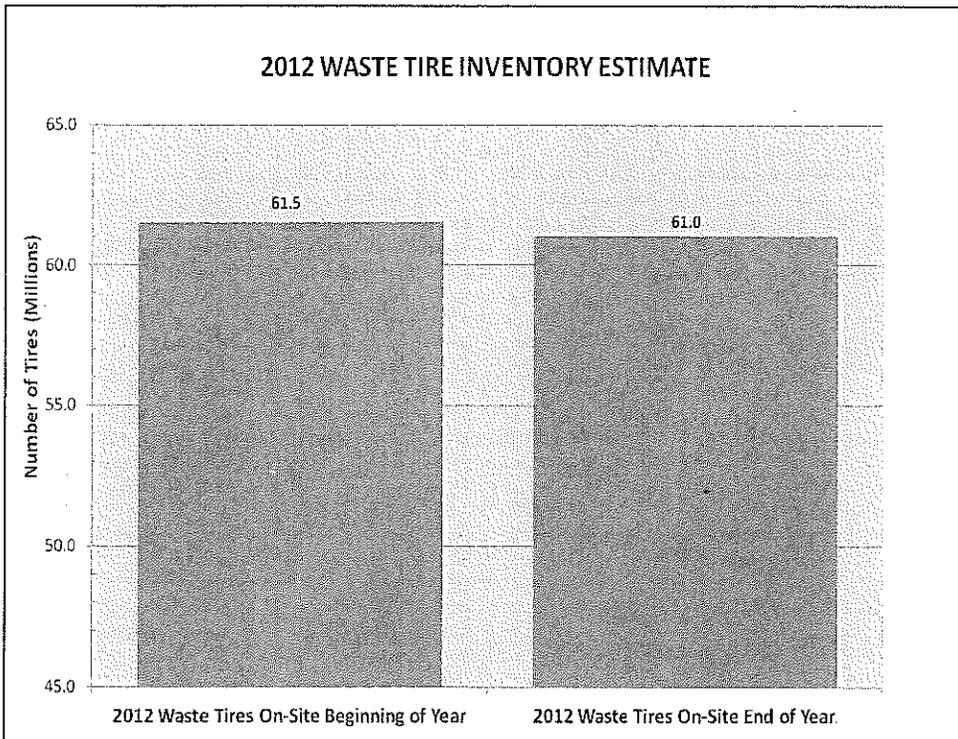
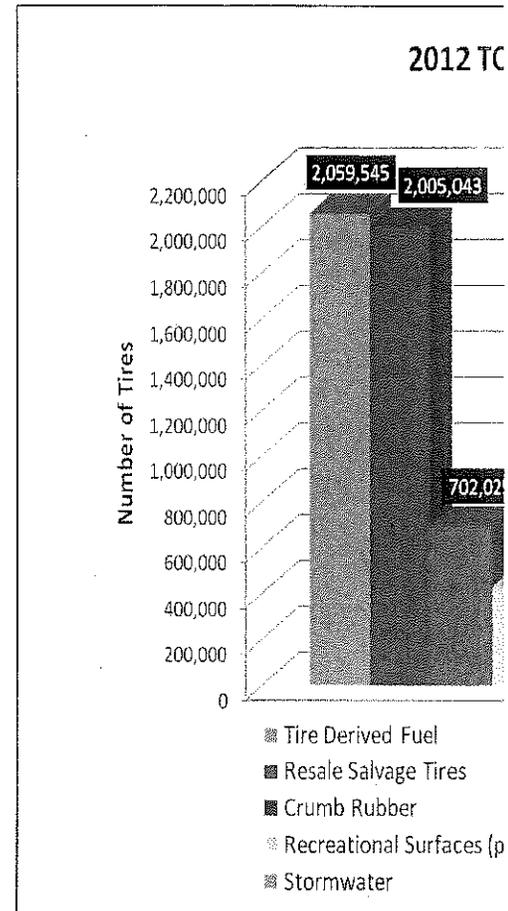
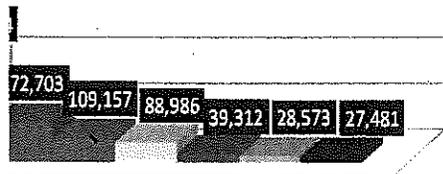


Figure 2



# Tire Activity

## RECYCLED WASTE TIRE USE MARKETS



- Alternative Daily Cover
- Fence/Windbreak
- Safety Products
- Landscaping
- Engineered Structures/Fill

Figure 3

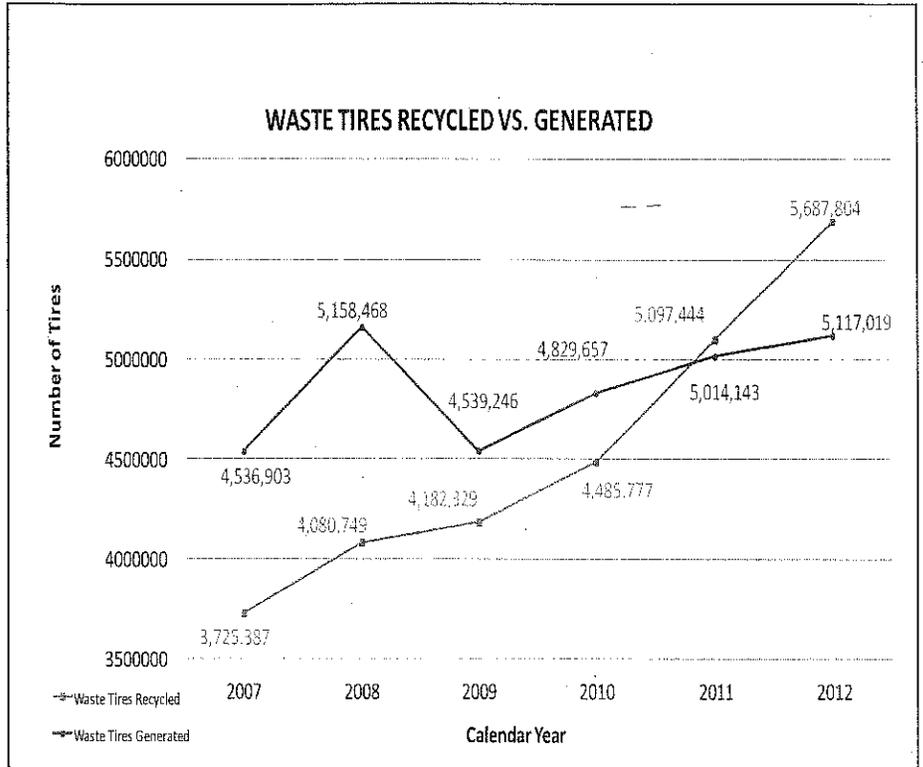


Figure 4

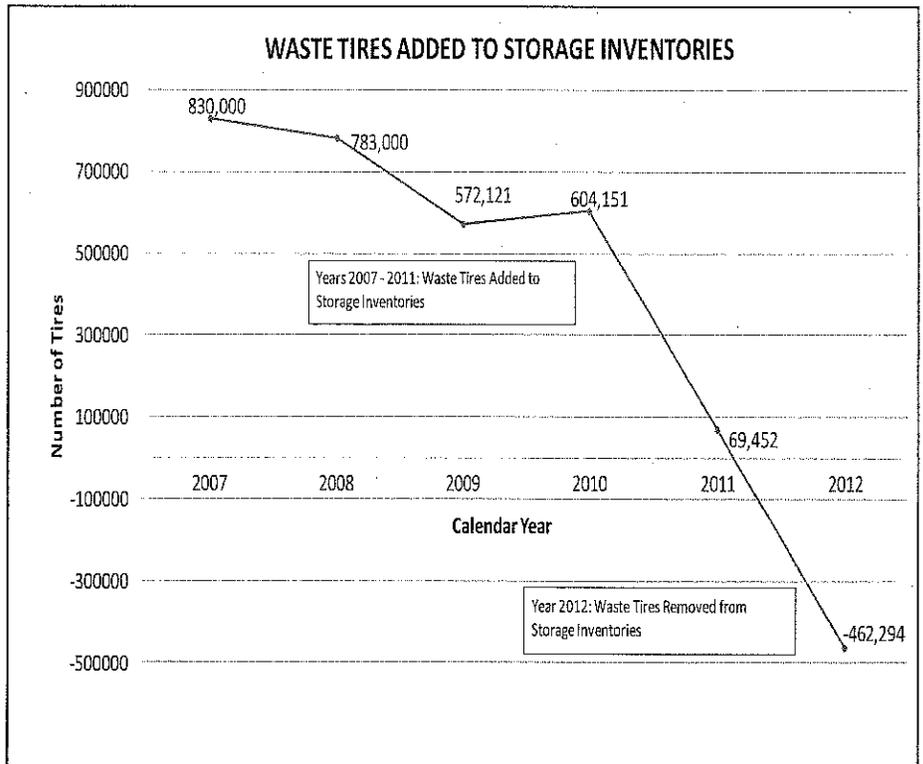


Figure 5

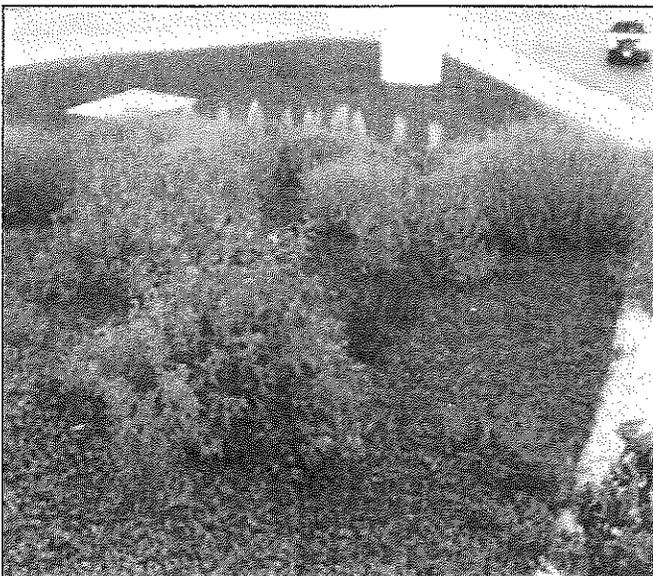
# Waste Tire Grants

## Market Development Fund

The Market Development Fund is to assist in developing markets for tire-derived products from waste tires.

The department awarded \$195,358 to Tetra Tech EM Inc. to develop a waste tire market development plan for the State of Colorado. Upon request of the Waste Tire Advisory Committee, the plan will have specific recommendations to meet the goal of recycling 100% of all newly generated waste tires and to reduce and eventually eliminate waste tires currently being stockpiled. The plan will be a roadmap for the department and the Waste Tire Advisory Committee to move the waste tire program forward with meeting these goals. The final plan was completed in May 2013. The plan includes recommendations regarding regulatory development modifications, waste tire stockpiles, market development, and lays out steps leading to the beneficial use of all waste tires produced and stored in the state of Colorado. The Colorado Waste Tire Market Development Plan is available on the Waste Tires website: [www.colorado.gov/cdphe/wastetires](http://www.colorado.gov/cdphe/wastetires).

The department awarded \$24,640 to the South I-25 Urban Corridor Transportation Management Association for a demonstration project of tire-derived landscape mulch at two intersections along Highway I-25 to determine the feasibility of using this material in place of traditional landscape material.



*Tire-derived mulch used as landscaping material at a metro Denver interstate interchange*

## Waste Tire Fire Prevention & Law Enforcement Grant Funds

The Waste Tire Fire Prevention Fund (Tire Fire Fund) assists fire departments, fire districts and other first responder fire entities with the purchase of equipment and supplies for the use at waste tire fires in Colorado. The Tire Fire Fund provides funding for the purchase of equipment and supplies for the prevention, preparation, response to and/or handling of waste tire fires. Eligible organizations include county, municipal, state and volunteer fire departments, fire districts and first responder fire entities.

Calendar year 2012 was the initial year of awarding Tire Fire Funds. The department and Waste Tire Advisory Committee (the committee) decided to award funds to fire agencies with waste tire monofills in their fire response area. The department reached out to these fire agencies and awarded a total of \$304,857 to seven agencies (see chart below) for purchase of fire equipment. An open competitive grant application process was developed for fiscal year 2013. The application process was successful as out of the eleven applications received, the department and committee members awarded grants totaling \$290,000 to eight applicants.

The Law Enforcement Grant Fund is available to the Colorado State Patrol, county sheriffs, police and fire departments and local health departments to assist with funding for waste tire activities. The department initiated an application process in calendar year 2012 but did not receive any applicants. The department continues to reach out to eligible agencies to apply to this Fund.

Grantee Name	Funds Spent on Equipment	Equipment Purchased
El Paso County Sheriff's Office	\$47,058	Air monitor
Fort Lupton FD	\$33,000	SCBA
Greeley Office of Emergency Management	\$47,058	Air monitor
Hanover FD	\$60,244	Ground monitor and SCBA
Hudson FPD	\$38,000	SCBA
Platteville-Gilcrest FPD	\$39,749	SCBA
Southeast Weld FPD	\$39,748	SCBA
<b>Total:</b>	<b>\$304,857</b>	

# Waste Tire Legislation

Two bills were passed during the 2005 legislative session that directly affected the management of waste tires in Colorado. The Waste Motor Vehicle Tire Hauler Act (HB 05-1126) required the registration of commercial transporters of waste motor vehicle tires. The intent of this legislation was to ensure transportation and delivery of waste tires to proper storage and recycling facilities and to minimize illegal tire dumping.

Senate Bill (05-141) regulated the disposal of residentially generated waste tires. Effective July 1, 2007, this bill limited the disposal of residentially generated tires in landfills.

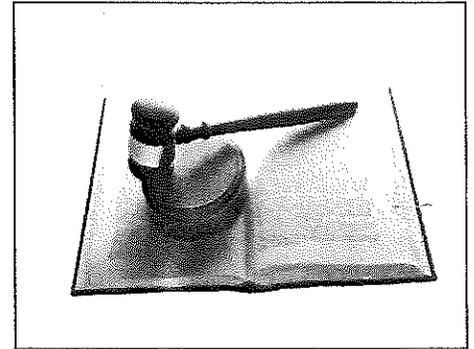
SB 09-289 was passed during the 2009 legislative session. Among other things this bill reallocated collection of the tire fee to the point of sale at tire retailers instead of the point of disposal, thereby improving collection of the funds. This bill also required facilities to use only commercial tire haulers registered with the state to transport waste tires, required the state to develop a plan for the elimination of tire monofills within 10 years and required the department to implement an outreach and education program for facilities handling tires. The combined result of this bill was to ensure waste tires were commercially transported to appropriate facilities and that more of these tires were ultimately recycled.

House Bill 10-1018 provided a cradle-to-grave or cradle-to-cradle regulatory approach for waste tires. This bill specified new registration, decal and manifest requirements for waste tire haulers and waste tire facilities. The bill also required

waste tire monofills to submit an inventory reduction plan to the department as a part of the facility Certificate of Designation. HB 10-1018 placed administrative authority for the waste tire funds with the department and allocated resources for new personnel to manage the fund and provide program enforcement.

House Bill 10-1018 transferred oversight of the Processor and End User Partial Reimbursement (Processor and End User), Illegal Waste Tire Cleanup and Recycling Incentive Funds from the Department of Local Affairs to the department's Division of Environmental Health and Sustainability. HB 10-1018 also created three new funds: the Waste Tire Market Development, Waste Tire Fire Prevention and Law Enforcement Funds, which are also administered by the department.

New regulations went into effect April 1, 2011, implementing the requirements of HB 10-1018 by setting up a cradle-to-grave or cradle-to-cradle management construct for waste tires to ensure that all newly generated waste tires are accounted for and properly recycled or dispositioned. The regulations set out the requirements for each type of facility or entity within the waste tire lifecycle — tire retailers and wholesalers that generated waste tires as they replace old tires with new tires on vehicles; waste tire haulers and waste tire collection facilities that manage waste tires in transit; waste tire processors and end users that either manufacture waste tires



into new products or turn waste tires into useable feedstocks; and waste tire monofills that store waste tires for extended periods. Regulations governing the Processor and End User Fund also went into effect on July 1, 2011.

House Bill 12-1034 was passed during the 2012 legislative session. This bill revised the definition of end user and modified the requirements of the Processor and End User Fund by requiring a processor of waste tires to end use the tire-derived product or process waste tires into tire-derived product for end use and move the tire-derived product off-site. The Processor and End User Fund section was also amended to require the department to identify other markets in Colorado that are able to eliminate illegal tire dumping and recycle or reuse waste tires in newer technologies.

New Processor and End User Fund and Waste Tire Facilities and Waste Tire Hauler regulations went into effect December 30, 2012 to implement the requirements of HB 12-1034. The new regulations modified who is eligible to receive a reimbursement from the Fund, clarified exemption language, removed waste tire hauler inconsistencies and standardized annual reporting dates.

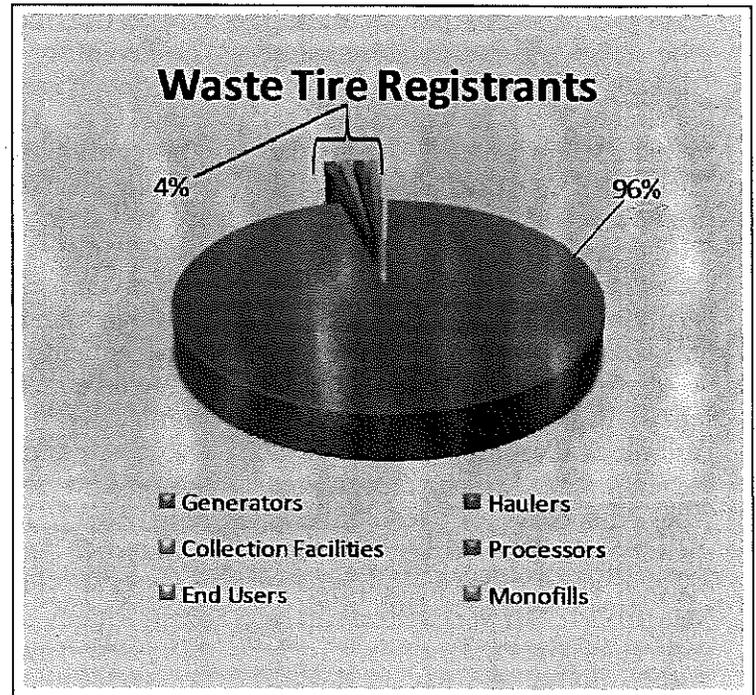
# Trends and Accomplishments

Calendar 2012 was another busy year for the Waste Tire Program. Hazardous Materials and Waste Management Division and Division of Environmental Health and Sustainability Waste Tire Program staff were involved in the revisions of two sets of regulations regarding waste tire management and implementation of the waste tire processor and end user reimbursement fund. The Solid and Hazardous Waste Commission passed updated regulations resulting from the passage of HB 12-1034, for Waste Tire Facilities and Waste Tire Haulers and administration of the Waste Tire Processors and End User Reimbursement Program on November 20, 2012. The department actively engaged waste tire stakeholders during the development of both regulations. Stakeholders included representatives from the Waste Tire Advisory Committee, waste tire haulers, waste tire processors, waste tire end users, waste tire monofills, landfill operators and local government officials.

In November 2012, the department initiated a stakeholder group to focus on the beneficial use of waste tires related to agricultural activities. This stakeholder group continued in 2013 to work on developing guidance that explains the requirements and flexibilities in existing statutes and regulations. Best management practices will also be developed using the new solid waste beneficial use process.

Waste Tire Program staff engaged in various efforts to inform the waste tire community of the regulations and the Waste Tire Program, including conducting compliance assistance outreach visits and inspections at waste tire facilities and waste tire hauler facilities. Waste tires outreach efforts also included staff presenting at the Northeast Solid Waste Operators biannual meeting, the Colorado Association of Code Enforcement Officer quarterly training session and the Colorado Rocky Mountain Chapter of the Solid Waste Association of North America Annual Conference. Staff also exhibited the Waste Tire Grant Program at the Colorado Counties Incorporated Winter Conference and provided conference attendees with jar openers made from recycled tires that were custom printed with the department's logo and the url for waste tire website.

The department continued to process waste tire registration applications and issue waste tire certificate of registrations. In 2012, the department issued over 450 new or updated waste tire certificate of registrations to registrants. Additionally, the



department developed a waste tire hauler renewal form and corresponding renewal instructions. This registration packet was mailed to all registered waste tire haulers. The department had a waste tire hauler renewal rate of 100% for the renewal cycle and issued new waste tire hauler vehicle registration decals. 2012 registration numbers were (see graph above):

- Waste tire generators (tire retailer, wholesaler or fleet service facility): 1,628
- Waste tire haulers: 75
- Waste tire collection facilities: 19
- Waste tire processors: 17
- Waste tire end users: 14
- Waste tire monofills: 3

## Waste Tire Resources on the Web

### Waste Tires Home Page:

[www.colorado.gov/cdphe/wastetires](http://www.colorado.gov/cdphe/wastetires)

### Solid Waste and Waste Tires Regulations

[www.colorado.gov/cs/Satellite/CDPHE-Main/CBON/1251607568997](http://www.colorado.gov/cs/Satellite/CDPHE-Main/CBON/1251607568997)

### Waste Tires Forms:

[www.colorado.gov/cs/Satellite/CDPHE-HM/CBON/1251616360987](http://www.colorado.gov/cs/Satellite/CDPHE-HM/CBON/1251616360987)

# Waste Tires and Public Health

In 1987 a facility known as "Tire Mountain, Inc." located in Hudson, CO, burst into flames. Lightning caused many of the tires to burn for days which released a billowing black smoke that could be seen for miles.

Arson and wildfires that engulf illegally dumped tires can create additional ignition sources for tire fires in Colorado. Controlled burns that get away can also start tire fires.

---

*'Dr. Urbina suggests that anyone can prevent the impact of tires on the environment and the public's health by recycling tires properly.'*

---

Tire fires often become major hazardous incidents that affect human health and the environment. In some cases, entire communities are evacuated and it is often recommended that these incidents involve active participation from federal, state and local response agencies 24-hours a day for several months. These fires can also pollute the soil, water and air.

Oil that discharges into the ground and surface water is a significant environmental pollutant which is also highly flammable. The average passenger car tire is estimated to produce over two gallons of oil when burned (Source: Rubber Manufacturers Association, April 2003).

Tire fires also produce air pollution. According to the US Environmental Protection Agency, air emissions from tire fires may include toxic air pollutants which are known or suspected to cause cancer and other serious health effects.



*Tire fire that occurred Spring 2013 in Northeast Colorado from a controlled burn that spread to an adjacent tire and haystack pile*

Due to the potential size, environmental impact, duration and cost of a major fire, prevention of tires fires is paramount. "In addition to the potential damage related to tire fires impacting the quality of air, land and water, there are significant risks related to public health," said Dr. Chris Urbina, department director. Disease carrying and nuisance pests present a second concern to human health and the environment. Stockpiled or illegally disposed tires provide shelter and a breeding ground for snakes, rodents and other vermin. The curved shape of a tire allows rainwater to collect and creates an ideal habitat for mosquitoes. Mosquitoes can breed in the stagnant water that collects inside tires.

Several varieties of mosquitoes can carry deadly diseases, including encephalitis and dengue fever. West Nile virus, which recently emerged in the US, is a mosquito-borne virus that causes viral fever syndrome and encephalitis. In 2012, Colorado there were 131 verified human West Nile virus infection cases. Five (5) of these cases resulted in death.

Short of removing tire piles, mosquito control and eradication programs are difficult and costly. Dr. Urbina suggests that anyone can prevent the impact of tires on the environment and the public's health by recycling tires properly.

# Waste Tire Facts and Facility Information

## Waste Tire Statistics

In 2012, using waste tires as tire-derived fuel replaced the use of 50,080 tons of coal, or enough energy to power 6,596 homes for one year, and avoided greenhouse gas emissions by recycling 43,980 tons of waste instead of sending it to the landfill.<sup>1</sup>



Using waste tires as tire-derived fuel produces the same amount of energy as oil and 25% more energy than coal.<sup>2</sup>



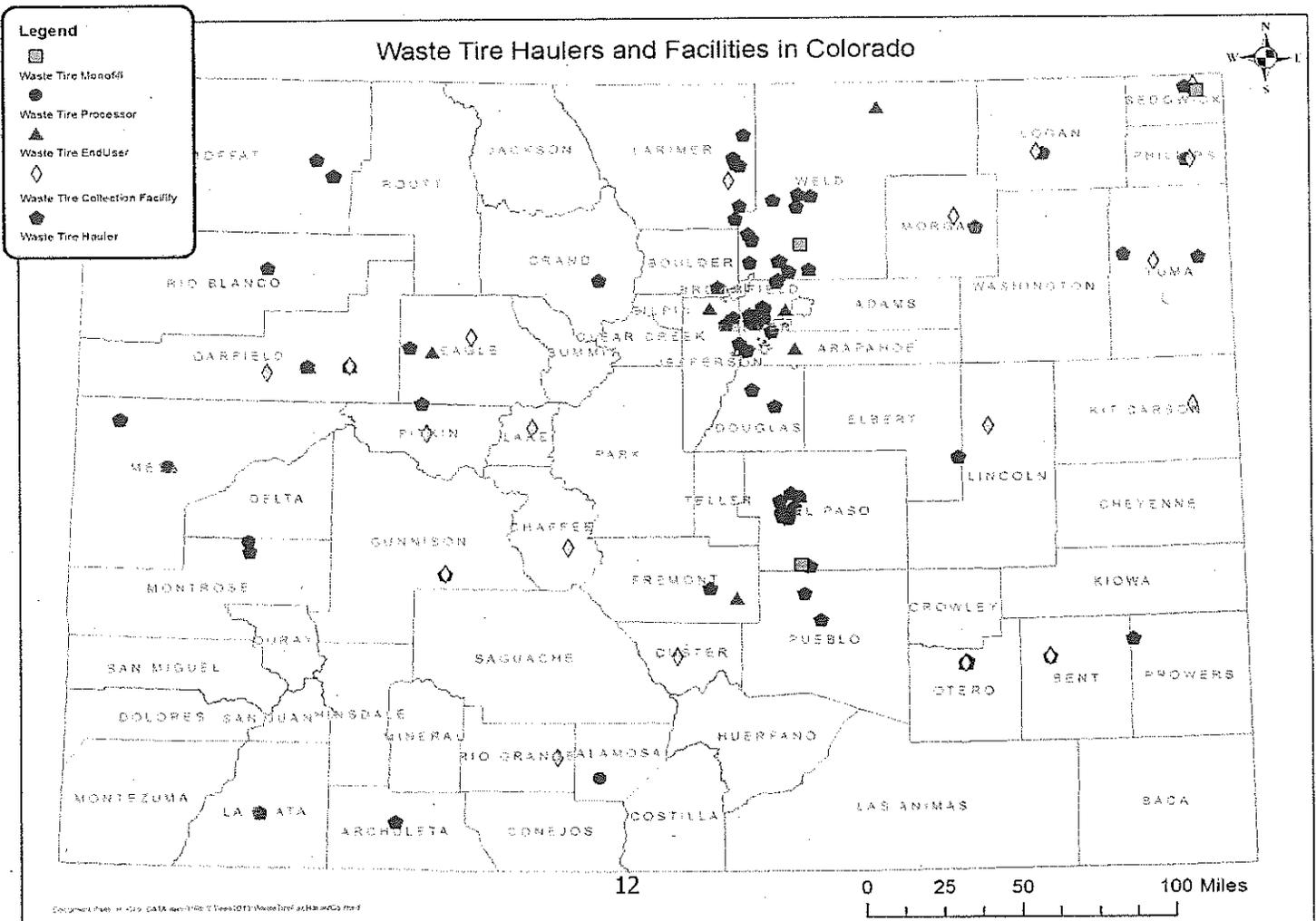
Nationally, the top three waste tire end use markets are tire-derived fuels, conversion into ground rubber that is recycled into products or rubber-modified asphalt and used tires for reuse or retreading.<sup>3</sup>



<sup>1</sup>United States EPA "Greenhouse Gas Equivalencies Calculator" updated April 2013

<sup>2</sup>United States EPA "Tire-Derived Fuel" updated November 2012

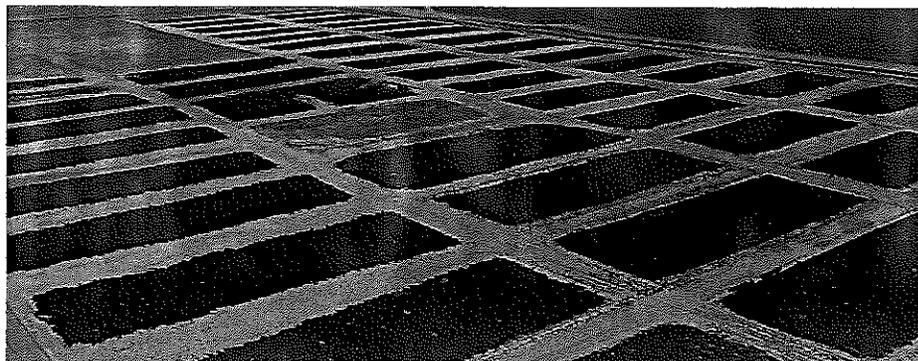
<sup>3</sup>Rubber Manufacturing Association "U.S. Scrap Tire Market 2009 Summary" 2011





Colorado Department  
of Public Health  
and Environment

# Colorado Waste Tire Market Development Plan



Prepared for:

**The Waste Tire Advisory Committee**

**The Colorado Department of Public  
Health and Environment**

Prepared by:

**Tetra Tech Inc.  
518 17<sup>th</sup> Street, 9<sup>th</sup> Floor  
Denver, Colorado 80202**

**May 9, 2013**

complex world

CLEAR SOLUTIONS™



**TETRA TECH**

# Colorado Waste Tire Market Development Plan

---

## Table of Contents

Acronyms .....	iv
1.0 Introduction .....	1
1.1 Purpose, Goals, Plan Organization.....	1
1.2 Contributors .....	2
2.0 Colorado's Waste Tire Situation .....	5
2.1 Colorado Waste Tire System.....	6
2.2 Current and Historical Waste Tire Generation .....	11
2.3 Current and Historical Waste Tire Storage .....	14
3.0 Influences on the Waste Tire System .....	14
3.1 Physical.....	15
3.2 Regulatory.....	15
3.3 Economic.....	23
4.0 Opportunities for Expanding Beneficial End Use.....	31
4.1 Current Market Perspective.....	32
4.2 Summary of Expansion Opportunities for Beneficial End Uses of Waste Tires in Colorado.....	50
4.3 Investment Strategies .....	50
5.0 Market Development Plan.....	57
5.1 Conceptual Model of the Goal State.....	57
5.2 Action Sequence .....	59
5.3 Monitoring Plan .....	59
6.0 References .....	62

# Colorado Waste Tire Market Development Plan

---

## 1.0 Introduction

Consistent with Colorado Revised Statute (CRS) 25-17-202.9, the Colorado Waste Tire Advisory Committee and the Colorado Department of Public Health and Environment (CDPHE) engaged a team of waste tire experts led by Tetra Tech, Inc.'s (Tetra Tech) office in Denver, Colorado, to prepare this Waste Tire Market Development Plan. This Waste Tire Market Development Plan presents an analysis of the waste tire situation in Colorado and then outlines an approach for the state to realize the beneficial use of all waste tires in the state.

This project was funded by the State of Colorado Waste Tire Program.

## 1.1 Purpose, Goals, Plan Organization

Colorado's Waste Tire Management Program is managed jointly by the CDPHE Hazardous Materials and Waste Management Division and the Division of Environmental Health and Sustainability. In 2010, Colorado House Bill 10-1018 authorized formation of the Waste Tire Advisory Committee to provide technical advice on specific waste tire issues to these CDPHE divisions. The Waste Tire Committee also reviews changes in the regulations for waste tires proposed by the CDPHE and other stakeholders.

Colorado Revised Statute 25-17-208 defines the focus of the Waste Tire Advisory Committee:

- a) Protect the safety and welfare of the citizens, wildlife, and environment adjacent to waste tire facilities;
- b) Develop sound enforcement practices and risk mitigation practices to prevent the loss of life, property, and the environment caused by waste tires;
- c) Prevent the illegal transportation and disposal of waste tires;
- d) Develop markets for tire-derived products; and
- e) Provide a long-term plan to reduce waste tire stockpiles and a waste tire market development plan.

Consistent with this focus, the purpose of this Waste Tire Market Development Plan is:

***To present a roadmap for identifying, expanding, and engaging waste tire reuse and recycling capacity in the state to achieve the goal of recycling or reusing 100 percent of newly generated and stockpiled waste tires in the state.***

To achieve this purpose, this Waste Tire Market Development Plan is organized around the following supporting goals:

- Section 2.0, Colorado's Waste Tire Situation, develops an understanding of:
  - The risks associated with waste tires.
  - A conceptual model of the sources, storage, movement, processing, and end uses of waste tires within the state.

- Current and historical waste tire production.
  - Current and historical waste tire storage.
  - Current and historical waste tire end uses.
- Section 3.0, Influences on the Waste Tire System, assesses geographic, demographic, climactic, natural resource, infrastructure, regulatory (federal and state), and economic influences to identify drivers and impedance factors for waste tire reuse and recycling in the state.
  - Section 4.0, Opportunities for Expanding Beneficial End Use, outlines the potential opportunities for creating additional end use capacity for waste tires, addressing increased capacity, associated capital investment requirements, and likelihood of success.
  - Section 5.0 presents the steps necessary to develop and engage the additional beneficial end use capacity identified in Section 4.0. A monitoring program for promoting and assessing the effectiveness of the Waste Tire Market Development Plan implementation, and allowing for ongoing refinements, is also presented.
  - Section 6.0 presents the references used in this plan.

The remainder of Section 1.0 presents the contributors to this plan.

## 1.2 Contributors

Table 1 lists the company or entity, role, and contact information for the people that authored and guided preparation of this plan.

**Table 1. Authorship and Guidance Team for the Colorado Waste Tire Market Development Plan**

Company/Entity	Role	Contact Information
CDPHE	Grant Administrator. Program direction, contract administration, information gathering and transfer.	Brian Gaboriau Waste Tire Grants Administrator CDPHE, Division of Environmental Health & Sustainability 4300 Cherry Creek Drive South DEHS-B2 Denver, CO 80246-1530 Phone: 303.692.2097 brian.gaboriau@state.co.us
Tetra Tech	Prime Contractor. Program management, research, planning, plan preparation, authorship, presentation development, economic analysis, and interview support.	Brian Myller Principal, Business Advancement Services Tetra Tech 518 17th Street, Suite 900 Denver, CO 80202 Phone: 303.312.8875 brian.myller@tetrattech.com

<b>Company/Entity</b>	<b>Role</b>	<b>Contact Information</b>
TAG Resource Recovery	Technical guidance, research, expertise on end uses (particularly energy uses), economic analysis expertise on engagement scenarios, regulatory review, plan authorship, engagement interviews.	Terry Gray President 18038 Radworthy Drive, Suite 110 Houston, TX 77084 Phone: 713.463.7552 tagray@flash.net
Recycling Research Institute	Expertise on current state of the science for waste tire end uses, waste tire regulations, waste tire collectors, processors, and markets; regulatory review; plan authorship.	Mary Sikora Principal Founder and Editor of Scrap Tire News, Editor of Scrap Tire and Rubber Directory P.O. Box 2221 Merrifield, VA 22116 Phone: 571.258.0500 mary@scraptirenews.com
Dr. Dana Humphrey	Technical expertise on civil engineering end uses, technical guidance, economic analysis.	Dr. Dana Humphrey Dean, College of Engineering University of Maine 5711 Boardman Hall Orono, ME 04469-5711

Table 2 lists the people who are currently on the Waste Tire Advisory Committee. Members of this committee provided review and comments on the plan.

**Table 2. Colorado Waste Tire Advisory Committee Members**

<b>Colorado Waste Tire Committee Member</b>	<b>Represented Entity</b>
Charles Johnson	CDPHE
Joel Bolduc	End User
Christopher "Chris" Houtchens	Waste Tire Haulers
Larry Hudson	Tire Manufacturers
James Reid	Local Fire Authority
Michael "Scott" Skorka	Tire Retailer
Cyrus "Rusty" Hardy, Jr.	Law Enforcement
Trent Peterson	Tire Monofill
Richard "Rick" Welle	Processors

More than 65 people were contacted during preparation of this plan to obtain information about Colorado's Waste Tire System and Program and ideas for possible improvements from a wide range of stakeholders. Further discussions with some of these stakeholders are included as a step in the Market Development Plan presented in Section 5.0.

**Table 3. Individuals Contacted During the Preparation of the Waste Tire Market Development Plan**

<b>Name</b>	<b>Organization</b>	<b>Name</b>	<b>Organization</b>
Christopher Houtchens	American Tire Exchange, Inc.	Justin Andrews	Holcim (US) Inc.
Lonnie Houtchens	American Tire Exchange, Inc.	Alan Greer	Geocycle (US)
Kevin Jacobs	Bridgestone Americas Tire Operations	Loren Snyder	Hudson Tireville
Robert deDios	CDOT	Dan Warta	Intrawest
Barbara Dallemand	CDPHE	Chris Barker	Jefferson County Open Space
Brian Gaboriau	CDPHE	Michael Irvin	Lake County Landfill
Charles Johnson	CDPHE	Randy Roth	Lakin Tire
David Snapp	CDPHE	William Spalding	Kersey Colorado
Karin McGowan	CDPHE	Randy Gorton	Kit Carson County Waste
Nick Boudreau	CDPHE	Steve Harem	Larimer County Solid Waste
Patrick Hamel	CDPHE	Debbie Martinez	Liberty Tire
Patti Klocker	CDPHE	Nicole Richins	Liberty Tire
Shana Baker	CDPHE	Rob Jahries	Liberty Tire
Bradley Wilson	CEMEX	Ryan Curtis	Liberty Tire
Denise T. Arthur, Ph.D	CEMEX	Mic Jaques	Lincoln County Landfill
Steve Goodrich	CEMEX	Dan Borgman	Logan County Landfill
Bradley Wilson	CEMEX	Todd Genovese	Martin Marietta
Jeff Lyng	Center for the New Energy Economy	Unnamed Representative	Morgan County Landfill
Shannon Wilcox	Chaffee County Waste Disposal	Kevin Walkowicz	National Renewable Energy
Francis Beland	CH2E	David Banas	Office of the Attorney General
Jeff Ackerman	Colorado Energy Office	Bill Andrews	Phillips County Landfill
Ken Kirkpatrick	Colorado Energy Recyclers	Unnamed Representative	Pitkin County Resource Recovery
Tom Binet	Colorado Office of Economic Development and International Trade	Alexandre Ivlev	Recycled Fuel
Dwain Immel	Colorado Tire Recycling LLC	Elizabeth Stengle	Republic Services
Teresa Immel	Colorado Tire Recycling LLC	Twylia Sekavec	Resource Management
Unnamed Representative	Custer County Landfill	Jim Clare	San Louis Valley Regional Solid Waste Authority
Kelly Berry	Eagle County Solid Waste and Recycling	Rustye Cole	Snowy River Enterprises
Brenda Zehr	EVRAZ Steel Mill	Larry Hudson	Tire Manufacturing
J.R. Gilles	EZ Play Surfaces	Robert Amme Ph.D	University of Denver
Rick Welle	Front Range Tire Recycle	Jason Chan	Waste Management
James Reid	El Paso County ESD	Lauren Light	Weld County

Name	Organization	Name	Organization
Verne Stuessy	Grupo Cementos de Chihuahua (GCC) (Midway Monofill)	Chris Peters	West Garfield County Landfill
Joe Collard	Geocycle (US)	Bradly Courtnage	WWF Incorporated
Bryan Sisson	Holcim (US) Inc.	Unnamed Representative	Yuma County Sanitary Landfill
Joel Bolduc	Holcim (US) Inc.		

## 2.0 Colorado's Waste Tire Situation

Colorado has the largest accumulation of unburied waste tires in the country. Estimates from 2011 indicated 60 million tires reside in monofills in the state, another 1 million tires are at temporary processor and collector facilities, and there are reportedly additional illegal waste tire accumulations requiring identification, quantification and abatement (CDPHE 2012a). Approximately 5 million additional waste tires are generated each year (CDPHE 2012a). According to the CDPHE, 93 percent of Colorado's waste tires generated annually were recycled or reused in 2010; this number increased to 100 percent in 2011 (CDPHE, 2012a). It is unknown how many waste tires are present in illegal stockpiles.

Unfortunately, stockpiled waste tires pose human health, environmental, and economic risks. These risks include:

- Substantial fire potential resulting from arson, lightning, and, when tire chips are present, possible auto ignition. Tire fires are extremely difficult to extinguish (some tire fires have lasted for years) and create air and water contamination that can require evacuation of nearby communities, and long-term, costly environmental remediation.
- Heightened disease vectors resulting from insects, particularly mosquitos, and rodents that hyper-populate in the tires and the water that is retained in the tires.
- Diminished value of land containing, and surrounding, waste tire stockpiles.
- Lost opportunity for agricultural, recreational, business, and residential use of property containing stockpiles.

In light of these risks, the state has enacted legislation intended to promote management practices for waste tires that protect and improve public health and environmental quality. This legislation includes House Bill 10-1018, which changed the authority for managing the waste tires and disbursement of the Colorado Waste Tire Budget, from multiple state agencies to the CDPHE. This bill also called for the establishment of the Colorado Waste Tire Advisory Committee, which is tasked to provide practical advice to the CDPHE regarding waste tire disposal, storage, transportation, regulations, and related funding.

The Waste Tire Advisory Committee consists of nine members, one from each of the major stakeholders in Colorado's Waste Tire Program:

- (1) CDPHE
- (2) End User
- (3) Waste Tire Haulers
- (4) Tire Manufacturer
- (5) Local Fire Authority
- (6) Tire Retailer
- (7) Law Enforcement
- (8) Monofill Operator
- (9) Processor

With the exception of the CDPHE representative, all committee members are appointed by the Governor and are listed on Table 2. The Waste Tire Advisory Committee is required by CRS 25-17-202.9 (1) to develop a Waste Tire Market Development Plan that encourages complete beneficial use of the waste tires present in the state.

## 2.1 Colorado Waste Tire System

Figure 1 presents a conceptual diagram of Colorado's waste tire system, a complex network of generators, storage sites, processing facilities, and end users interconnected by a network of transporters.

The information presented on Figure 1 reflects information collected by the CDPHE in 2011 (CDPHE 2012).

*Generators*, represented by the orange box on the upper left side of Figure 1, input a near-continuous flow (or flux) of about 5 million waste tires into the system per year. This annual generation results from the discard of used or faulty tires at tire retailers, auto dealers, auto dismantlers, public and private vehicle



**Hudson Tireville (Recently Purchased by CH2E)**

maintenance shops, garages, service stations, car care centers, automotive fleet centers, local government fleet operators, and rental fleets. There are approximately 400 generators in the state.

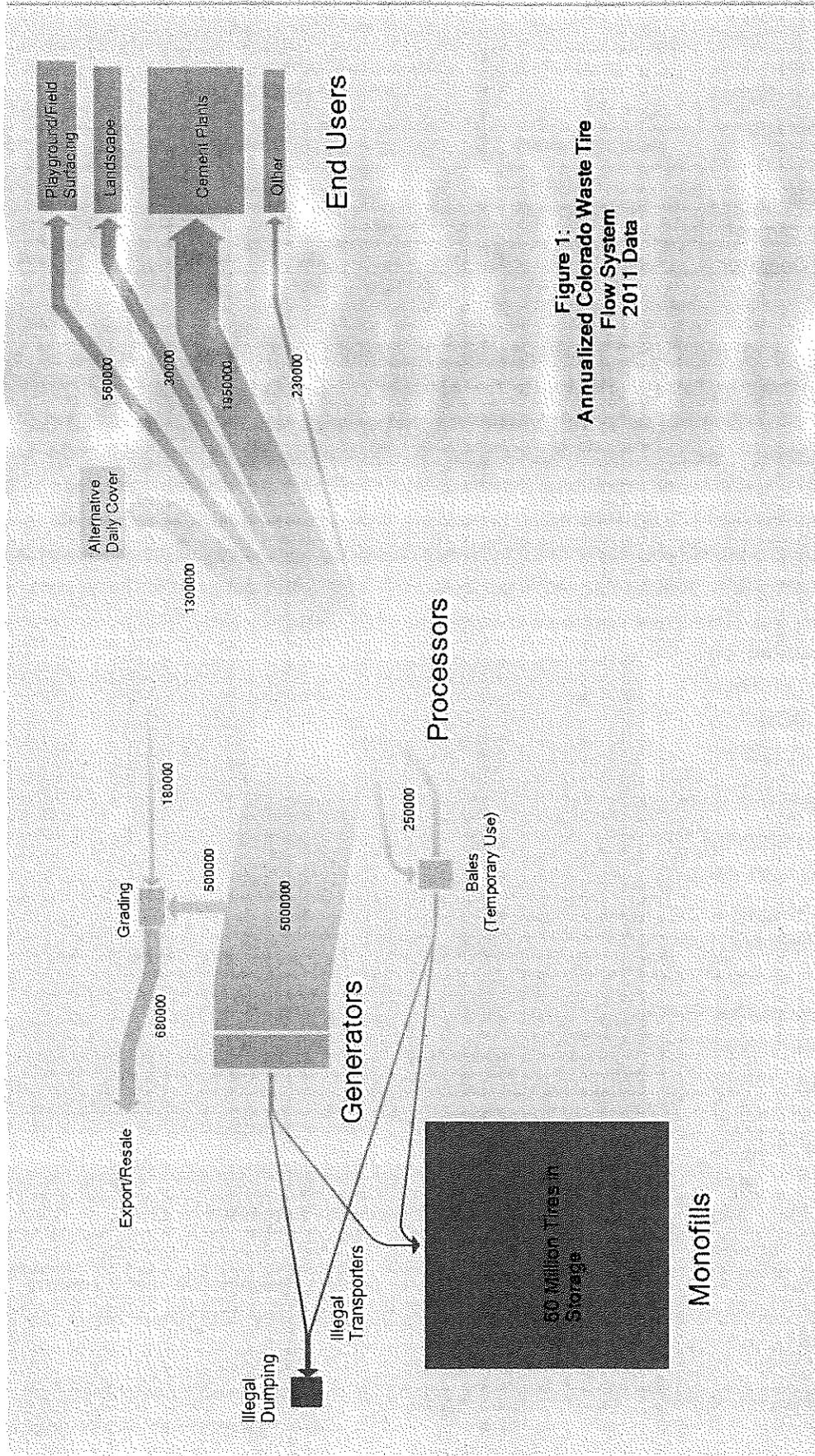


Figure 1:  
Annualized Colorado Waste Tire  
Flow System  
2011 Data

Storage sites, shown in red on the left side of Figure 1, involve locations where waste tires collect over time and include:

- Legal monofills that contain only stored waste tires.
- Legal landfills that may contain tires and other waste.
- Illegal tire dumps that may contain only tires, or tires mixed with other waste.

There are three legal monofills in the state: the Hudson Tireville (recently purchased by CH2E LLC and shown in the photo above), located north of Hudson, Colorado, contained an estimated 31.5 million waste tires in 2011; the Midway Monofill (recently purchased by Grupo Cementos de Chihuahua, SAB de CV [GCC] and shown in the photo below), located south of Colorado Springs, Colorado, contained an estimated 26.3 million waste tires in 2011; and the Resource Management Company facility in Julesburg, Colorado, had an estimated 2.5 million waste tires (CDPHE 2012)



**Midway Monofill**

There are also numerous illegal tire dumps and inventory accumulations scattered throughout the state.

*Processors*, shown in yellow in the center of Figure 1, use specialized equipment to cut, slice, chip, shred, or grind whole waste tires into a size that is suitable for downstream recycling or end use. Processors also segregate reinforcing wire and fabric liberated from tires during processing. Processors are required by law to be registered annually.

Some companies construct tire *bales* (central portion of Figure 1), a method of volume reduction whereby whole or cut tires are compacted into a bundles and then banded together to form a bale measuring approximately 4 feet by 4 feet by 8 feet that weighs approximately 2,000 pounds. Tire bales are used as wind breaks, fences, sound barriers, and other applications. As shown on Figure 1, tire bales are considered temporary use, and not

long-term beneficial use, because the bands holding the tires together ultimately break, leaving piles of waste tires that need to be re-managed.

*End Users*, shown in green on the right side of Figure 1, receive whole or portioned waste tires, chips, crumb rubber, or other waste tire-derived materials from processors and then use this material as a (1) source of energy, (2) feedstock for the manufacture of products, or (3) an actual product for use. The major types of end users known to be in operation in Colorado at the end of 2012 are shown on Figure 1.

End uses are considered “beneficial” when the end use technologies and practices employed improve (lessen) environmental and social impacts. Examples of beneficial end uses for waste tires can include heat generation and iron oxide input for cement plant kilns; heat generation and metal and carbon input for steel mills; ground rubber for applications and further processing into other products; civil engineering applications including landfill drainage aggregate and highway construction applications; and pyrolysis, which may be able to produce a type of fuel oil and other potentially sellable products if historical technical and economic obstacles can be overcome.

The U.S. Environmental Protection Agency (USEPA) considers using waste tires for fuel a beneficial use, and cites the following advantages (USEPA 2012):

- Tires have a similar energy content to oil and a significantly higher energy content per pound than coal;
- The ash residues from Tire Derived Fuel (TDF) may contain a lower heavy metals content than some coals;
- When substituted for coal (particularly high-sulfur coals) in cement kilns, waste tires can result in lower nitrogen oxide compound (NOx), sulfur oxide compound (SOx), and greenhouse gas emissions.

Waste tire end uses are further detailed in Section 4.2 of this plan.

*Alternative Daily Cover*, shown in the central portion of Figure 1, is a practice that involves spreading a layer of chipped tires on top of the daily-added waste at municipal landfills to prevent the wind-borne transport of the waste material. Alternative daily cover is generally considered a beneficial end use, but is not encouraged in some states because of its potential for abuse. When used properly, it is applied as a thin layer. When abused, it is applied in thick layers and becomes landfill disposal, and not end use. Other civil engineering applications for shredded tires (including others within landfills, such as leachate drainage layer, operations layer, gas collection) become an integral part of the engineering design and inspection, and are less vulnerable to abuse. No reports or indications of abuse were identified in Colorado during this study.

*Transporters* move the waste tires between the generators, monofills and landfills, processors and end users, and are represented by the arrows on Figure 1. The current annual transported waste tire flow volumes and directions are represented by the width of the arrows (wider arrows signify larger waste tire flow volumes) and the orientation of the arrow heads. The estimated flow volumes for the larger waste tire flows are also shown numerically on or near the arrows.

Transporters in the State of Colorado (as well as retailers, monofill operators, and processors) are required by law (statute and regulation) to register annually. Legally operating transporters properly load waste tires onto transport vehicles, drive the waste tires across the state's road system, drop the waste tires off at licensed processors or end users, and use manifests to document the origin, quantity, composition, routing, and destination of waste tires being transported. In some cases, trailers are parked at tire retailers or collection centers to facilitate accumulation of tires for optimal transportation efficiency.

It is illegal to transport more than 9 waste tires per load without a current registration, and without following the required vehicle, safety, loading, weight, disposal, and manifesting requirements. Illegal transportation of waste tires by unregistered carriers is known to occur. Illegal transportation results not only in unsafe, undocumented transport of tires to processors and monofills, but also creates and expands illegal tire dumps (Figure 1) that are environmental and public liabilities. Illegal transporters have a negative impact on the economic structure of Colorado's waste tire industry and the people who follow the state's statutory and regulatory requirements. Consequently, consistent enforcement of waste tire transportation regulations across the state is critical to the success of Colorado's waste tire management program.

Some transporters include an intermediate step in their process of handling tires that is often referred to as *grading*. Grading involves assessing used tires for remaining tread life and carcass integrity. Tires are resold to dealers and agents for subsequent resale as used tires in the U.S. and other countries when tread thickness exceeds a minimum thickness requirement. This practice diverts a portion of the waste tires from downstream movement in the system, effectively increasing the residence time of tires within the system (Figure 1). This grading step is also practiced by some processors.

As shown on Figure 1, information available at the end of 2012 indicated that an annual generation of approximately 5 million waste tires was nearly completely delivered to end users. On the other hand, the estimated 60.2 million waste tires in monofills and 1 million waste tires in temporary storage at processors and collection facilities at the end of 2012 were not being substantively decreased (CDPHE 2012a). Current regulations require removal of 75 percent of waste tires received at monofill and storage sites (based on 3-year averages), but allow the remainder to be accumulated.

Based on these estimates, expansion of existing end users, or creation of new end users, will need to take place to consume the existing tires in monofills and stockpiles. The mandated date for abatement of monofills was recently extended from 2019 to 2024. To accomplish the goal of consuming the waste tires in monofills and stockpiles by 2024, end use capacity would need to increase by an average of approximately 6 million additional tires per year. This expansion in end use capacity is over and above the existing end use capacity that is currently consuming most of the annually generated waste tires. Without market expansion, tires from monofill abatement could flood existing markets and drive annual generation into other stockpiles. Future expansions in end use capacity and abatement of existing accumulations will need to be managed in a manner that does not negatively affect the end use of the annually generated waste tire stream.

Figure 3 shows the aerial distribution of monofills, generators, major processors, and major existing end users across the state. The representation of generators—primarily new and used tire retailers—on Figure 3 is notional. This figure shows that the vast majority of tire generation, processing, and end use occurs within the most populated metro areas along the Colorado Front Range, including the areas surrounding Ft. Collins, Boulder, Denver, Colorado Springs, and Pueblo. Waste tire generation also occurs in less populated towns throughout the state. While the volumes of waste tires in the less populated areas is relatively low, the challenges associated with moving waste tires from the less populated areas to the processors located along the Front Range can be significant.

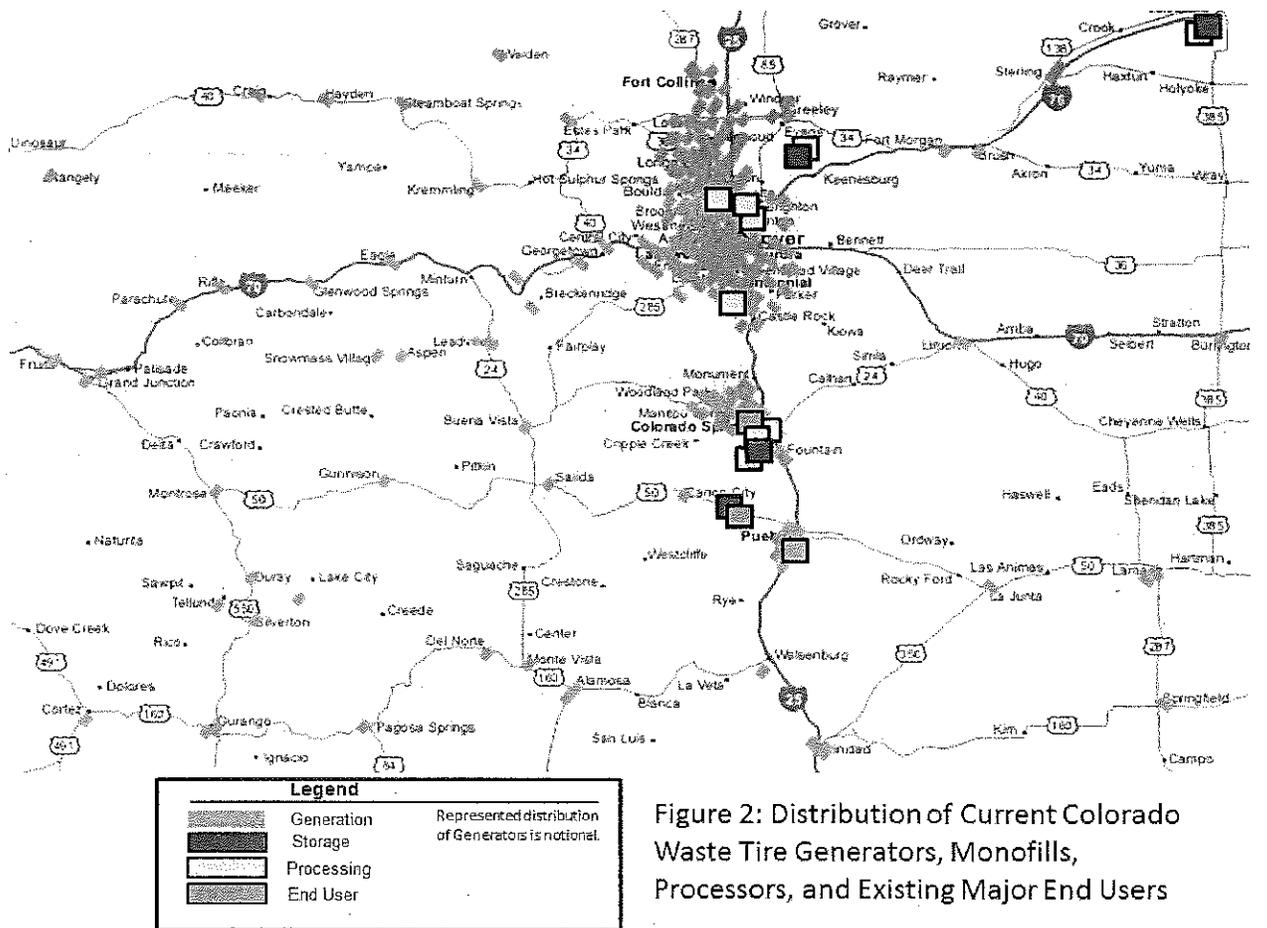


Figure 2: Distribution of Current Colorado Waste Tire Generators, Monofills, Processors, and Existing Major End Users

## 2.2 Current and Historical Waste Tire Generation

A cornerstone of an effective waste tire management program is defining the quantity of tires generated within the state. Waste tires primarily come from stores that install replacement tires and from vehicle salvage operations. It is difficult to estimate unit sales based on sales tax revenue because of the industry's complex product mix and price variations unless actual units are specifically identified on tax submittal forms. There are no publicly available industry statistics for replacement tire sales or salvaged vehicles within individual states. As a result, state generation is estimated based on proration of available nationwide data.

The Rubber Manufacturers Association (RMA) compiles national sales of original equipment and replacement tires annually, as shown on Table 4. Sales were compiled for 2011 and 2012 to examine recent variability. The data are provided in units and converted to Passenger Tire Equivalents (PTE) and to tons for subsequent use in the market analysis. The term “passenger tire equivalent” allows conversion of various tire sizes into a common weight basis. A PTE is an average passenger and light truck tire with a current weight of 22.5 pounds based on the most recent RMA data. A medium truck tire is equivalent to almost 5 PTE and has an average weight of about 110 pounds.

The PTE weight can change gradually over time, reflecting variations in the size of vehicles and associated tires. An average of 22.5 pounds has been used by the RMA for the past 4 to 5 years.

**Table 4: 2011 and 2012 United States Replacement and Original Equipment Tire Sales**

2011					2012				
REPLACEMENT TIRES (all units in thousands)					REPLACEMENT TIRES (all units in thousands)				
Type	Quantity	PTE/Unit	PTE	Tons	Type	Quantity	PTE/Unit	PTE	Tons
Passenger	194,395	1	194,395	2,187	Passenger	190,929	1	190,929	2,148
Light Truck	28,601	1	28,601	322	Light Truck	28,060	1	28,060	316
<b>Subtotal</b>	<b>222,996</b>		<b>222,996</b>	<b>2,509</b>	<b>Subtotal</b>	<b>218,989</b>		<b>218,989</b>	<b>2,464</b>
Medium Truck	16,508	5	82,540	929	Medium Truck	15,847	5	79,235	891
<b>Total</b>	<b>239,504</b>		<b>305,536</b>	<b>3,437</b>	<b>Total</b>	<b>234,836</b>		<b>298,224</b>	<b>3,355</b>
<b>ORIGINAL EQUIPMENT TIRES</b>					<b>ORIGINAL EQUIPMENT TIRES</b>				
Passenger	35,738	1	35,738	402	Passenger	40,048	1	40,048	451
Light Truck	4,181	1	4,181	47	Light Truck	4,245	1	4,245	48
<b>Subtotal</b>	<b>39,919</b>		<b>39,919</b>	<b>449</b>	<b>Subtotal</b>	<b>44,293</b>		<b>44,293</b>	<b>498</b>
Medium Truck	4,946	5	24,730	278	Medium Truck	5,074	5	25,370	285
<b>Total</b>	<b>44,865</b>		<b>64,649</b>	<b>727</b>	<b>Total</b>	<b>49,367</b>		<b>69,663</b>	<b>784</b>
<b>TOTAL</b>	<b>284,369</b>		<b>370,185</b>	<b>4,165</b>	<b>TOTAL</b>	<b>284,203</b>		<b>367,887</b>	<b>4,139</b>
<b>Source: Rubber Manufacturers Association(1)</b>					PTE is Passenger Tire Equivalent = 22.5 pounds				

Several correlations may be used to identify the proportion of national waste tires generated within Colorado. The most directly associated parameters are population, vehicle registrations, and gasoline consumption. The most recent available nationwide and Colorado statistics for each parameter are provided in Table 5. Although the most recent common basis for the data is 2010, the ratios do not generally change significantly over several years, as illustrated by the minor difference between the population ratios in 2010 and 2012 shown in Table 5. Colorado’s percentage of each of these parameters ranges from 1.63 percent to 1.95 percent. Colorado’s gasoline consumption (1.95 percent) may be influenced by its higher percentage of SUV and pickup trucks with poorer gas mileage, combined with a relatively high proportion of mountain driving. The arithmetic average of the three is 1.77 percent, with a projected maximum deviation of 10 percent.

**Table 5: Waste Tire Generation Parameters**

Parameter	Quantity		% Colorado
	US	Colorado	
<b>POPULATION</b>			
2010	308,745,538	5,029,196	1.63%
2012	313,914,040	5,187,582	1.65%
<b>VEHICLE REGISTRATIONS (2010)</b>			
AUTO	130,892,240	1,890,748	1.44%
BUS	846,051	9,343	1.10%
TRUCK	110,322,254	2,280,207	2.07%
<b>SUBTOTAL</b>	<b>242,060,545</b>	<b>4,180,298</b>	<b>1.73%</b>
<b>GASOLINE CONSUMPTION (2010)</b>			
2010	2,541,871,000	49,635,000	1.95%
<b>AVERAGE</b>			<b>1.77%</b>

National 2012 replacement tire sales were 234,836,000 units, representing 298,224,000 PTE and 3,355,000 tons. 2012 original equipment tire sales were 49,367,000 units representing 69,663,000 PTE and 784,000 tons. The total was 284,203,000 units, 367,887,000 PTE and 4,139,000 tons. The 2012 and 2011 totals differed by less than 1 percent.

The estimated waste tire generation in Colorado has been calculated in Table 6 based on national replacement tire sales and RMA's estimate of waste tires from salvage vehicles, as well as the proration percentage for Colorado of 1.77 percent of the U.S. total (multiplier of 0.0177). Based on these calculations, total 2012 waste tire generation in Colorado has been estimated to be 4,622,143 units representing 6,558,275 PTE and 73,780 tons.

**Table 6: Estimated Waste Tire Generation in Colorado**

Parameter	Replacement Tires			Salvage Vehicles			Total
	US Total	CO Multiplier	Colorado	US Total	CO Multiplier	Colorado	
<b>Tires</b>	234,838,000	0.0177	4,156,633	26,300,000	0.0177	465,510	4,622,143
<b>PTE</b>	298,224,000	0.0177	5,278,565	72,300,000	0.0177	1,279,710	6,558,275
<b>Tons</b>	3,355,000	0.0177	59,384	813,375	0.0177	14,397	73,780

The projected fees associated with the sale of new replacement tires and original equipment manufacturer (OEM) and replacement tires in Colorado is calculated in Table 7. Prorated tire units are multiplied by the appropriate fee for each type of tire. Based on this calculation, the total fee collections on replacement tire sales for 2012 should have been approximately \$6,235,000. It should be noted that this amount represents fees over a calendar year, while the state collections are reported on

a fiscal year basis. However, there was little variation in tire sales between the 2011 and 2012 calendar years, so this distinction is not anticipated to significantly affect this comparison.

Colorado collects the fee only on new replacement tire sales, while some states view the fee as advanced payment of tire management program costs and apply it to all new tire sales, including the tires on newly purchased (OEM) vehicles. Inclusion of OEM tires in Colorado would increase fee revenue by an estimated \$1,311,000 annually and could help fund abatement of monofills and stockpiles in the future if needed.

**Table 7: Projected Fee Collection in Colorado in 2012**

	US	CO Multiplier	CO Quantity	Fee/ Tire	Fee
<b>Replacement Tires</b>					
Pass/LT	218,989,000	0.0177	3,876,105	\$1.50	\$5,814,158
Medium Truck	15,847,000	0.0177	280,492	\$1.50	\$420,738
<b>Subtotal</b>	<b>234,836,000</b>		<b>4,156,597</b>	<b>\$1.50</b>	<b>\$6,234,896</b>
<b>New OEM Tires</b>					
Pass/Lt Truck	44,293,000	0.0177	783,986	\$1.50	\$1,175,979
Med Truck	5,074,000	0.0177	89,810	\$1.50	\$134,715
<b>Subtotal</b>	<b>49,367,000</b>		<b>873,796</b>		<b>\$1,310,694</b>
<b>TOTAL</b>	<b>284,203,000</b>		<b>5,030,393</b>	<b>\$1.50</b>	<b>\$7,545,590</b>

### 2.3 Current and Historical Waste Tire Storage

The Tetra Tech team used aerial photographs, brief on-site observations, and discussions with operators to approximate volumes of tires in the three largest existing monofills. The aerial photographs for the Hudson Tireville monofill (now owned by CH2E) in Weld County, the cited average cell size, and historical densities of similar piles approximate the state's estimate of 31.5 million waste tires (CDPHE 2012). At the Midway Monofill (now owned by GCC) in El Paso County and the Resource Management Company monofill in Sedgwick County, the uncertainty of underlying cell structures did not allow for meaningful approximation of the stored tire volumes. Estimates referenced in the CDPHE Status of Waste Tire Recycling in Colorado, 2011, report (CDPHE 2012) of 26.3 million tires at the Midway Monofill, and 2.5 million tires at the Resource Management company monofill are used in this plan.

### 3.0 Influences on the Waste Tire System

This section discusses physical, economic, and regulatory influences on Colorado's waste tire system.

### 3.1 Physical

The physical influences on Colorado's waste tire system stem primarily from the areal distribution of the major processors and end users along the Colorado Front Range, generators located throughout the state, and the mountainous setting of the western half of the state (Figure 3). The costs of transporting tires from less populated areas of the state to processors located along the Front Range are increased by travel distances and, in the western half of the state, the increased challenges of mountain driving. Some tires generated in western Colorado are transported to Utah processors based on these economics. Transportation costs can contribute to the presence of tire dumps in the less populated areas of the state.

Mountain driving by Colorado citizens may also increase the rate of waste tire generation through increased tire wear associated with twisty roads. Furthermore, the regular occurrence of snow in many parts of the state creates the need to use snow tires, which tend to wear more quickly than regular road tires.

Colorado is also located relatively close to coal, oil, and gas energy resources. This proximity can influence the cost of these energy sources relative to potential energy cost savings that can be gained from using waste tires as a fuel source. Colorado is distant from ocean shipping centers, which increases the cost associated with moving waste tires into overseas transport systems, effectively reducing opportunities for participation in export markets.

### 3.2 Regulatory

Many state waste tire management programs have been created with good intentions, but their success has suffered because they were (1) developed with inadequate practical knowledge and data regarding the local waste tire market, or (2) influenced by local political interests. Good programs recognize the need to evolve to meet changing market and program needs, correct loopholes/abuses, and to ultimately create a sound program with a predictable, level regulatory playing field that benefits all stakeholders. Colorado's program is evolving positively, but still has issues that can be improved as the program continues to evolve.

This regulatory analysis addresses seven key elements of the Colorado Waste Tire Program:

- Stockpile Abatement
- Processor/End User Reimbursement
- Market Development Fund
- Waste Tire Fire Prevention Fund
- Waste Tire Law Enforcement Grant Fund
- Department of Revenue Fee
- Regulatory Definitions

Current characteristics are discussed for each of these key elements, and then recommendations for improving the overall benefit to the program stakeholders are presented below.

### 3.2.1 Stockpile Abatement

Legal waste tire accumulations at registered monofills, collections sites and processors have been identified and are being monitored by CDPHE. The estimated 61.2 million waste tires at these sites at the end of 2011 represent a substantial, but known, abatement challenge. In addition, there are believed to be other unidentified illegal waste tire stockpiles and dumps located within the state. They are generally located in uncontrolled locations and can represent substantial public health and environmental hazards. Identification and abatement of these illegal stockpiles is a critical component of an effective state waste tire management program.

The State of Colorado's current program places responsibility on counties for illegal stockpile identification, project coordination, abatement contractor selection and management, and even contractor payment from local funds until reimbursement is received from the state program. As a result, there is no broad-based effort to identify and prioritize illegal stockpiles throughout the state. Few stockpiles are identified, and even fewer are abated, because counties are unwilling or unable to shoulder the burden of negative cash flow associated with contractor payments. Little to no accountability is placed on the stockpile creator or landowner for costs associated with abatement.

The following recommendations represent a combination of components with demonstrated results from states that have successfully completed abatement of existing piles. In all states with successful programs, the state waste tire management program is responsible for the following activities:

- Pile Identification—The state is responsible for working with counties and all other appropriate groups (such as game and fish, law enforcement, solid waste, illegal dumping, and citizens groups) to identify all significant illegal stockpiles in the state on a continuing basis.
- Prioritization—The state prioritizes the sites based on an assessment of tire quantity, fire hazard, safety, population density, and environmental characteristics of each site.
- Contractor Pre-qualification—The state uses a Request for Qualifications or similar process to select qualified contractors capable of abating identified stockpiles and constructively utilizing the tires without impairing markets for newly generated waste tires. This reduces the potential for cleaned up stockpiles to force newly generated tires into other stockpiles or landfills. Typically, 3 to 6 contractors are pre-qualified. For the following 2 to 4 years, the pre-qualified contractors are able to provide simple competitive bids quickly when stockpile sites are designated for abatement.
- Contractor Selection/Monitoring—A stockpile summary and a competitive bid response sheet is prepared and provided to each pre-qualified contractor when a site is designated for cleanup. The bids are made on a cost/ton basis for a uniform quantity estimate provided by the state. Contractors can typically respond promptly because of the site information provided by the state and specified response criteria. The process is efficient and cost-effective, and it may promote significant cost savings. The state is responsible for monitoring contractor performance but often draws on local officials to assist in this effort. Sometimes, the state pays a nominal stipend to the cooperating local agency to cover time and expenses associated with their assistance. The state reserves the right to reduce or refuse payment to contractors for loads that are heavily contaminated with dirt or debris.

- Continuity—Stockpile abatement is variable and therefore costs may vary between fiscal years. As a result, many states roll previously designated funds for this specific activity from budget year to budget year unless there is no foreseeable need for future abatement activity. This change could enhance operational flexibility and help funding and contractor activity become more predictable.
- Cost Recovery—The state places financial accountability for management of waste tires on the creator of the waste tire stockpile or the landowner that allowed the waste tires to be accumulated, or both. The initial stockpile assessment includes an investigation into responsible parties. If responsible parties with financial resources are identified, the state uses its enforcement options to have them abate the pile in a reasonable period of time. If prompt abatement is not possible, the state gains legal access to the site and abates the site with public tire fund resources.

Some states seek to recover costs associated with stockpile abatement from the stockpile creators and landowners, especially in cases where the landowner was aware of the practice or received compensation. The threat of cost recovery clearly discourages landowners from allowing disposal or poorly conceived management applications on their property if they may ultimately be held responsible for paying for site abatement.

In Florida, more than 65 percent of the tires in stockpiles were abated by the landowners to avoid cost recovery. The state placed liens on properties to protect its financial claims when it performed the abatement. Cost recovery can be waived if there is no reasonable chance of recovery or if the legal costs were likely to exceed any such recovery. The objective is accountability—forcing payment on those who profited instead of the public. The recovered funds are often used for other constructive purposes within the waste tire programs.

These regulatory approaches have proven effective and efficient in other state Waste Tire Programs.

### 3.2.2 Processor/End User Reimbursement

The current reimbursement program in Colorado disburses all funds each month at a variable rate (\$/ton) based on dividing the available funds by the tonnage of requests received for reimbursement. To support in-state processors and markets, only processors and markets in Colorado are eligible for payment. Available funds change as a result of seasonal variations in tire sales and receipt of roll-over amounts from unused balances in other parts of the tire program. Reimbursement requests may vary through seasonality or variable product sales for large projects. The result is a variable and unpredictable reimbursement rate that can financially destabilize the very companies that it is intended to assist.

The current end user reimbursement also fails to reimburse end users of some important products that are sold through distribution channels. Examples include colored mulch, playground cover, and other crumb rubber products. The processor or end user payments get tangled in a web of definitions and practical obstacles that create an unlevel playing field and actually discourage development of some

good products and markets. The variable reimbursement rate creates instability in an industry that already faces enough challenges.

The processor or end user reimbursement system should be changed and simplified to encourage all approved major market segments uniformly and enhance financial predictability, as recommended below.

### **Processor/End User Reimbursement**

The processor and end user payments should be revised to allow processors to consolidate and receive the end user payment for products sold through distribution channels to individual customers using less than 50 tons. A consensus of stakeholders appears to favor a 1:1 split of the processor/end user payment. Separate processor and end user payments provide a cross-check on each other and allow processors and end users to negotiate and obtain equal incentive and reward. However, practical issues associated with end user payments to some end user markets (as noted above) have led most states to simplify the system by combining processor and end user payments into one payment to processors based on tonnage processed and sold to documented third party customers and distributors (with demonstrated distribution channels to end users).

Some early processor payment systems failed in other states because there was no requirement for third party sale of processed product. Texas, for example, spent \$70 million converting piles of whole tires into piles of shredded tires with a substantial additional public liability for abatement of the resulting shredded tire piles because no markets were created by the processor payments. A processor must not receive payment unless the product is sold to approved markets with acceptable documentation. This provision forces the processor to establish product pricing that drives the market, in effect sharing the subsidy with the end user to create a viable market. Subsidy payments are used by a limited number of state programs, but most of those that are considered viable use this system, including Oklahoma and Louisiana.

### **Reimbursement Process**

The entire financial system associated with Colorado's waste tire program is driven by good intentions to assure complete use of all funds every year. This approach avoids accumulations within the fund, but it removes the working capital required to allow stable, predictable operation within a longer-term framework. It is also structured to avoid overpayment issues. States that have committed to long-term fixed processor payments have often encountered short falls that have caused partial or delayed payments to processors or required use of supplemental general revenue funds for financial salvation. Historical examples include Oklahoma, Louisiana and Utah. Balancing payment stability and predictability with the absolute requirement of staying within fund financial limitations poses a practical challenge.

One possible solution would be to establish a conservative reimbursement calculation methodology that would allow a predictable reimbursement rate while allowing accumulation of a working capital cushion to minimize the impact of reasonable variations in fees and product sales. Projected available funding

could be based on 90 percent of the average of the 2 preceding years. Projected tonnage eligible for processor payment could be based on 110 percent of Colorado's annual tire generation plus any anticipated monofill abatement quantities adjusted to reflect tonnage. Dividing this total would result in a conservative projected processor payment per ton produced and sold, paid on a uniform basis throughout the year. Tires collected from stockpile cleanups would have to be excluded from the reimbursement or the projected tonnage would have to be adjusted to reflect this volume if it is included in the reimbursement. Abatement of illegal stockpiles is generally considered separately funded and not eligible for additional reimbursement.

This conservative calculation basis should allow accumulation of a working capital cushion during the year. The calculation basis can be adjusted each year to reflect historical experience once a reasonable cushion has been established. Substantial adjustments in the reimbursement rates should be done gradually to allow processors and collectors to adjust alternative revenue sources. Increases in fees charged to pick up tires generally offset reimbursement decreases if companies have reasonable time to implement these changes. Contracts may limit the ability to change rapidly.

Once the processor reimbursement becomes predictable and significant, it may also have some negative impacts. The quantity of waste tires may expand as tires are drawn into Colorado from neighboring states or stockpiles as a result of the increased economic incentive. The manifest system and its enforcement will become critical factors in controlling abuses. This potential drawback has led to fraud, abuse and system failure in other states.

Two products should be excluded from the processor reimbursement. Used tires recovered from the waste tire flow reenter the usable tire market and should be considered waste tires only when they are no longer being used on vehicles as tires. In Colorado's system, the fee is not paid on sale of used tires, so the subsidy should not be paid. To do otherwise would allow for the possibility of subsidy payments being made two or more times on a tire when the fee is paid only once. In addition, baled tires compact the tires only until the bands break and then generally require further abatement or reprocessing. Including baled tires in the processor reimbursement system would open the door to multiple processor payments with only one fee payment. Baling is the least expensive tire volume reduction process and does not require a subsidy for appropriate applications. In addition, baled tires have historically failed in a high percentage of applications.

### 3.2.3 Market Development Grant Fund

Processor reimbursements can assist processors during initial program development and operation. However, they can also create false economics that lead to market and program failure when the reimbursement program sunsets. The potential for this outcome can be reduced by gradually decreasing reimbursements and shifting resources to the Market Development Grant Fund. The current Market Development Grant Fund and the Recycling Incentives Fund should be consolidated and a suitable scope of activities should be established to allow the range of activities necessary to be an effective market development tool.

To enhance the market development fund's effectiveness, it should be restructured to include competitive one-time grants designed to help with the following:

- Demonstrate and establish new markets through grants for initial applications or geographic diversification;
- Overcome initial capital obstacles for new markets by partially funding end user equipment required for initial use. In this case, capital can be provided as a loan that is converted to a grant based on subsequent actual tire usage.
- Partially fund product testing or engineering studies or other technical assistance required to support market development and acceptance.

These are just examples. This type of one-time support of end use markets can significantly accelerate market development without on-going subsidies, so these markets tend to survive in a free market system.

Some of the projected rollover and repayments at the end of this fiscal year could be diverted to this program to allow its rapid initiation. This diversion of funds would also prevent unsustainable spikes in processor reimbursements from these funding sources that impede future transition to a self-supporting free market system.

#### 3.2.4 Waste Tire Fire Prevention Fund

The current Waste Tire Fire Prevention Fund allows funds to be used for training and equipment purchases for a variety of fire department and enforcement groups. It has been effectively utilized for these purposes, but could potentially provide additional value to the program if the money could also be used for other purposes.

For example, it may be appropriate to allow local and state fire officials to draw on supplemental funds or technical resources to assist in review, development, and implementation of fire control plans for major stockpiles identified within the state. Since future resource requirements will be less than historical equipment purchases, funding could be reduced and redeployed into the Market Development Fund.

#### 3.2.5 Waste Tire Law Enforcement Grant Fund

The current Waste Tire Law Enforcement Grant Fund program provides primarily for training of law enforcement officers. This limited scope prevents use of grants or disbursements to encourage interagency coordination and cooperation in waste tire enforcement.

It may be appropriate to allow grants to state and local law enforcement agencies to provide supplemental funding for their assistance in coordinated enforcement efforts of waste tire hauling and dumping regulations with appropriate documentation of these efforts. Additional education and regular communications to law enforcement agencies in the state to increase and maintain attentiveness to waste tire hauling and storage enforcement may also be in order. Clarifying and possibly modifying penalties associated with violation of waste tire hauling, dumping and storage regulations deserves

careful analysis. Other states have established penalties that command accountability, including felony penalties for some extreme violations.

### 3.2.6 Department of Revenue Fee

It is probable that a significant amount of projected fee revenue is not currently being collected. A total of \$5,719,201 was collected in fiscal year 2012, while projections indicate that the total could have approached \$6,235,000. In joint consultation between departments, methods may be identified that would enhance collection rates and decrease disparities that undermine the program and its enforcement. These methods may require resources beyond the current limitation of 1.667 percent of revenue specified in the act. It may be helpful to allow up to 2.5 to 3.0 percent for activities supported by both departments and with proper reporting as currently specified. The result could be a net increase in program revenue and credibility.

### 3.2.7 Regulatory Definitions

Definitions play a vital role in developing regulations and regulatory policy. Ensuring that the terms used throughout the regulatory framework refer to consistent definitions is critical to effectively and efficiently achieving program goals. This section presents definitions that can be used as the foundation for advancing Colorado's Waste Tire Management program to address both stockpiled tires and annually generated waste tires.

The definitions included here represent suggested changes to existing definitions in the current Colorado regulations found at SB09-289, HB10-1018, and HB12-1034. They also include new language to support proposed Waste Tire Program Statutory/Regulatory Alternatives. They are suggested for consideration, but should be carefully examined for compatibility with all applicable waste tire regulations and other underlying solid and hazardous waste statutes and regulations

These definitions are not comprehensive but offer a basis for clarifying implementation of current regulations and a pathway for enhancing Colorado's Waste Tire Program through new proposals for regulatory and market development alternatives designed to enhance and grow markets for waste tires and waste tire derived products in Colorado.

*Baled tire*—method of volume reduction of waste tires, whereby whole or cut tires are compacted into a bundle and then banded together to form a tire bale. Baled tires will not be considered for processor or end use subsidies.

*End user*—the last person or entity that uses the waste tires, chips, crumb rubber or similar materials to make a product with economic value or in the case of energy recovery, that utilizes the heat content or other forms of energy from the combustion or pyrolysis of whole waste tire, chips, shreds, or similar materials.

*Manifest*—a form or document used for identifying the quantity and composition and the origin, routing and destination of waste tires during transportation from point of generation, through any intermediate points to a processor, end user or disposer as approved by the regulating agency.

*Retail tire dealer*—a person or entity actively engaged in the business of selling new replacement tires. Retail tire dealers may also be, but are not limited to, manufacturers, wholesalers and others who sell new replacement tires.

*Retreadable casing*—a tire that has the quality and soundness of the tire structure to accept a retread or repair and provide additional service and is destined for retreading.

*Retreaded tire*—a casing to which a new tread has been affixed to extend the useable life of the tire. “Recap” is another term for a retreaded tire.

*Tire*—a tire for any passenger vehicle, including any truck, weighing less than 15,000 pounds, and for any truck, including any truck tractor, trailer, or semi-trailer, weighing more than 15,000 pounds, but not more than 50,000 pounds.

*Tire derived material (product)*—material derived from waste tires after processing such as, but not limited to, chipped, shredded, cut or sliced tires, crumb rubber, steel cord, cord material, oil or carbon black and has been sold and removed from the facility of a waste tire processor. This definition does not include a tire bale composed of whole tires or any components of waste tires.

*Used tire*—a tire that previously has been on a vehicle but that retains suitable tread depth (a minimum 2/32-inch of road tread) and is free of damage or defects so that it may safely be returned to its original purpose. It must be inventoried and marketed in substantially the same fashion as a new tire, the dealer must be able to provide satisfactory evidence to the regulating agency that a market exists and that the used tires, are in fact, being marketed.

*Waste tire*—a tire that is no longer mounted on a motor vehicle and is no longer suitable for use as a tire as a result of wear, damage, or deviation from the manufacturer’s original specifications.

*Waste tire facility*—a processing site that is used for the processing of waste tires and that is owned or operated by a processor who has the required registration for the site, a waste tire monofill, a collection facility as defined by the commission, and any other facility at which a quantity of waste tires in excess of a limit established by rule by the commission are stored for at least 90 days, processed or disposed of. Locations and operations associated with activities funded by the waste tire cleanup fund are excluded.

*Waste tire generator*—any person who generates waste tires. Generators may include, but are not limited to retail tire dealers, auto dealers, auto dismantlers, public and private vehicle maintenance shops, garages, service stations, car care centers, automotive fleet centers, local government fleet operators, and rental fleets.

*Waste tire hauler*—any person, business, or other entity engaged in the business of picking up and transporting waste tires for processing, recycling, approved storage or shipment out of state. Waste tire hauler does not include a solid waste collector operating under a license or franchise from any local government unit, a private individual or private carrier who transports the person’s own waste tires to a processor or for proper disposal, a person who transports fewer than five tires for disposal, or any county, city, town or municipality in this state.

*Waste tire processing*—any method, system or other treatment that changes the physical form, size or chemical content of waste tires so that they are no longer whole, such as cutting, slicing, chipping, shredding, distilling, freezing, or other processes that are approved by the regulating agency and produce tire derived material that is readily suitable for downstream recycling, beneficial re-use, or sale to an end user.

*Waste tire processor*—any person or entity that is approved by the regulating agency to receive tires from waste tire generators or waste tire haulers for waste tire processing.

These definitions are believed to be consistent within themselves, but careful review will be required to assure broader consistency when they are incorporated into current or modified Colorado legislation or regulations.

### 3.3 Economic

Several economic factors influence the movement and storage waste tires in Colorado. These factors include energy costs, regulatory costs, subsidies, and market trends at the national and state levels.

Coal, oil and gas, are relatively inexpensive in Colorado. Their relatively low cost makes tire-derived-fuel less attractive as an alternative energy resource in Colorado compared with many other states. Nevertheless, waste tires are still able to offset energy costs in many circumstances in Colorado. Additionally, improvements in corporate branding, community acceptance (license to operate), and regulatory compliance can be positive economic outcomes associated with the use of waste tires as fuel.

#### **National Trends**

Several key trends that are influencing market conditions at the national level are described below (RMA, 2012).

- Competition for waste tires is increasing. This increased competition is largely the result of strong demand for waste tires in Asia and other countries that has led to the rise of “unpermitted and non-compliant operations” competing for tires. For the most part, activity has been concentrated in regional areas in California, Washington, Florida, and the Mid-Atlantic states but has caused a shift in supply lines for processors, including ground rubber producers, and temporarily pushed tip fee revenues down in these geographic areas.
- Tire reuse and retreading is up. Domestic used passenger vehicle tire sales increased by 35 percent over 2010 and truck tire retreading increased by 13 percent, according to industry statistics. Consumers seeking cost savings in a slow economy are driving demand.
- Truck tire supply is down. Truck tires have long been the desired feedstock for crumb rubber producers. The relatively high natural rubber content in truck tires, as well as the low metal and fiber content, allows crumb rubber producers to meet market and customer specifications for certain products and applications. Truck tire supplies are challenged by several factors, including relatively stable generation rates for truck tires, the increased number of truck tires compromised by export and baling operations, and strong demand for reuse of truck tires domestically and in Mexico and South and Central America.

- Crumb rubber markets have grown slightly. Overall U.S. crumb rubber market demand grew by slightly more than 3 percent over 2010, although certain market sectors challenged by the economic uncertainties and other factors remained flat.
- Rubberized asphalt grew significantly in some markets (California, Georgia, and Massachusetts) but overall ground rubber consumption in this market held steady at the 2010 level of 185 million pounds. Several recent developments in this market sector could have positive impacts on the future demand for ground rubber in asphalt applications. These developments include:
  - In 2012, the industry formed the Rubber Asphalt Foundation to expand the rubberized asphalt market through coordinated informational and educational campaigns.
  - The American Association of State Highway Transportation Officials (AASHTO) approved several changes for testing standards that will allow recycled tire rubber into the widely used performance grade asphalt standards used by state Departments of Transportation.
  - A new study by the National Center for Asphalt Technology concluded that the method of manufacturing crumb rubber, whether cryogenic or ambient, does not impair the performance or quality of rubber asphalt pavements.
  - The Georgia Department of Transportation amended the state's road construction specifications to include recycled tire rubber as an alternative to conventional polymers in asphalt production.
  - Several Canadian provinces are conducting programs to research and use rubberized asphalt. This development is important because successful use in Canada, together with cold weather performance data in New England and Sweden, further dispels the misperception that rubberized asphalt is only a warm weather technology.
  - Laboratory and field tests show that rubberized asphalt saves \$2 to \$5 per ton and performs better than conventional polymer-based asphalt.
  - Other growing opportunities for ground tire rubber include increased use with warm mix asphalt, recycled asphalt pavement, thin pavement overlays on concrete pavement, and development of terminal blend technology and a new plant mix technology (Recycling Research Institute, 2012-13).
- Crumb rubber going into turf and athletic and recreational fields increased by 31 percent in 2011 continuing the growth trend in this market from 2010. For this application, crumb rubber typically in the 10 to 30 mesh range is used as infill between the blades of "grass" in synthetic sports fields. A promising area of expansion in this market sector is crumb rubber infill for natural grass fields, lawns, and other grassy areas. Renewed interest in the benefits of crumb rubber in protecting grass root systems, and improving drainage and lawn health are driving demand.
  - On the downside, most installations in the athletic and recreational field market are for municipal recreational facilities and school districts making this market segment vulnerable to government budget shortfalls. In addition, although concerns over health

and safety risks have largely been mitigated, projects—especially those where children will be using the field—are still vulnerable to questions about potential health impacts.

- The pour-in-place playground market used slightly more crumb rubber in 2011 (about 2 percent). The majority of pour-in-place products use buffings as their main ingredient and only a small percentage of ground rubber. For most pour-in-place products, crumb rubber is used in the base layer, while tire buffings are used in the surface layer. Pour-in-place surfacing generally meets Americans with Disabilities Act (ADA) requirements for wheelchair accessibility and is less susceptible to concerns about fire and other health and safety factors. As a result, some industry stakeholders predict this application could surpass loose-fill playground surfacing.
- The molded and extruded product market increased by 29 percent in 2011 with opportunities for expansion in this market in the feedstock conversion and new product development categories. Market drivers in this category include potentially lower raw material costs, enhanced product performance and new marketing opportunities in the green build sector.
- Market demand for ground rubber playground mulch and landscape mulch was flat overall in 2011. The playground rubber mulch market largely depends on grant funding in most states and its use is often limited or cancelled by budget constraints. The higher up-front cost of rubber playground mulch and the potential for renewed health and safety concerns further constrain this market. On the upside, playground rubber mulch typically outsells competing materials based on its enhanced fall safety, longer life and lower maintenance costs benefits.
- Landscape rubber mulch demand slowed in 2011 as municipal parks and recreation divisions dealt with reduced budgets and retail sales saw less rapid turnover of rubber mulch compared with other products. Industry stakeholders predict substantial room for growth in this market as the economy improves and consumers take advantage of rubber landscape mulch's lower maintenance costs, longer use life (it does not deteriorate or need to be replaced yearly) and its resistance to bugs and insects.

### Colorado Trends

- Market conditions that influence the movement of waste tires at the state level are described below.
- Colorado's waste tire collection and processing industry is experienced, but is continuing to evolve to meet changing needs. The majority of Colorado's waste tire businesses have been in operation for more than 15 years. Ten waste tire companies operate in the state currently. Other than the first years of Colorado's Waste Tire Management Program when only one or two businesses were involved in collection of tires, the number of companies that manage Colorado's annual waste tire generation has been consistent at eight to 10 companies. The services these companies provide have continued to evolve within basic parameters of collecting, hauling, sorting, processing, and baling.
- Crumb rubber ranks fourth on Colorado's 2011 Top Ten Recycled Waste Tire End Use Markets list. According to the ranking, 468,786 tires were consumed in the production of crumb rubber. However, these tires went out of state to a Utah-based processor where the crumb rubber was produced. Of these, the report indicated that 63,280 waste tires were used to produce crumb rubber for recreational and playground surfacing and 28,879 waste tires were used to produce ground rubber landscape mulch (CDPHE 2012).

- Of the 10 waste tire processing facilities registered to process tires in Colorado in 2011, two companies added or configured their processing capability to manufacture crumb rubber for mulch, playground surfacing and equine footing. Front Range Tire Recycle, Inc. manufactures ¾ inch, ½ inch and ¼ inch ground rubber. Another Colorado waste tire processor, Snowy River Enterprises, makes ¾ inch ground rubber for landscape mulch. In addition, Colorado waste tires supply a Utah waste tire processor that manufactures ground rubber in sizes ranging from ¼ inch to 20 mesh. Together, these ground rubber producers consumed 560,945 Colorado waste tires to produce ground rubber (CDPHE 2012).
  - Colorado's only dedicated crumb rubber processor closed in 2006. The company began operations in 1992 and built a crumb rubber market for playground and recreational field surfacing, infill for natural grass and synthetic turf, landscape mulch, and equine arena footing. Another firm acquired the company's assets in 2007. That company went out of business in 2011.
- New business entities have continued to show interest in participation in Colorado's waste tire industry. CH2E recently purchased the Hudson Tireville Monofill and has expressed interest in developing and implementing a business strategy capable of constructively using the monofill's waste tire resources. Likewise, GCC of America has purchased the Midway Monofill and stated its intention to use waste tires as a supplemental energy resource in its cement manufacturing facility. Other companies continue to explore opportunities to participate in the industry.

### **Evaluation of Incentives**

Colorado's tire recycling infrastructure is driven largely by the makeup of the Colorado waste tire market (such as TDF, tire derived aggregate [TDA] applications and monofills), and by the state's legislative and regulatory framework that includes incentives for both processors and end-users. Colorado incentivizes the use of Colorado waste tires in public projects involving, for example, playground surfacing, athletic fields, and infill for existing turf surfaces, through the Public Projects grant program.

During 2011, 11 recycling incentive grants in seven counties were completed. The total amount awarded was \$612,044 to fund the use of crumb rubber from 112,301 tires for two athletic field installations and 10 playground safety surfacing installations. In 2012, 12 communities received incentive grants totaling \$502,764 to fund the use of crumb rubber from 86,008 tires for four athletic fields and eight playground surfacing projects. Incentive grants for 2013 total \$507,540 for 13 projects in three cities and two school districts that will use ground rubber from 81,278 tires for athletic field and playground surfacing and playground mulch.

Colorado waste tire industry stakeholder and waste tire program managers cite the education and community outreach the projects provide as one of the program's main benefits. The program has made tire recycling visible in communities throughout the state with products and uses that improve safety and lower maintenance and costs. Officials believe these benefits will eventually allow these end-users to stand on their own without incentives and attract non-government incentives (private sponsorship of projects and fund-raising).

While there are some retail sales of mulch to homeowners, and private purchases involving athletic fields and molded and extruded products, the majority of ground rubber used in Colorado is purchased by state and local government entities.

The slow economic recovery continues to have a negative impact on state and local government purchasing nationwide and, with housing sales still lagging, local government budgets will likely be challenged for several more years. As a result, in Colorado and nationally, ground rubber markets for playground and athletic surfacing remain flat.

#### **End User and Processor Partial Reimbursement Program**

The End User Program was created by law (HB 98-1176) in 1998 and amended in 2001, 2003, and 2007 to include additional funds for end user and processor reimbursements. Initially, this program was managed by the Department of Local Affairs (DOLA) and provided up to \$20.00 per ton of waste tires in partial reimbursements. The reimbursement payment was increased several times reaching \$50.00 per ton before the program was moved to CDPHE in 2010. The 2010 legislation raised the maximum reimbursement to \$65.00 per ton. From 1998 through 2007, more than 26 million tires were reused or recycled through the End User and Processor Partial Reimbursement Program.

#### **Evaluation of Historical Market Development Strategies**

As noted earlier, quantifying ground rubber markets for waste tires is difficult, mainly because most processors do not track the entire market or define ground tire applications the same way. In Colorado, tracking ground rubber markets is particularly difficult because a significant, but not consistently tracked, portion of the state's ground rubber is brought in from out of state. This makes it difficult to quantify the state's ground rubber markets and end uses, and also to plan for growth.

Despite the inconsistent reporting, it is apparent from discussions with processors that Colorado lacks ground rubber markets and has limited ground rubber processing capacity. Several years ago, the state commissioned a study to address the lack of ground rubber markets, and specifically rubberized asphalt. Led by Dr. Bob Amme, the study, "Promoting Rubberized Asphalt and Other Waste Tire Products in Colorado" (Amme, 2008) aimed to increase the beneficial use of Colorado's waste tire rubber by raising the awareness of agencies and contractors regarding the use of ground tire rubber as an asphalt modifier. It was launched in response to the essentially non-existent market in Colorado for rubberized asphalt paving, crack sealing and related road surface treatments.

The study was aimed at demonstrating that rubberized asphalt provides a quieter, safer roadway surface along with longer pavement life and can be more economical than the types of paving currently used in Colorado. It also looked at demonstrating the use of rubberized asphalt mix in designing pedestrian trails with the goal of opening up a potential new market for ground rubber that, if successful, could consume significant quantities of ground rubber.

The study is important because it identified weaknesses in the ground rubber market and potential needs in Colorado and laid out marketing and promotion strategies to grow the use of rubberized

asphalt on Colorado roads and trails. These strategies are valid recommendations for building ground rubber markets and mirror similar efforts that are being successfully employed today in other states and nationally to expand the use of rubberized asphalt.

For example, during the Colorado study, efforts were taken to engage stakeholders, including rubberized asphalt experts, paving professionals, transportation and environment agency representatives, road contractors, and equipment and technology representatives in educational workshops and meetings designed to raise awareness of the benefits of both ground rubber and rubberized asphalt for Colorado communities.

In Georgia, a similarly designed program was the impetus for bringing attention to the use of rubberized asphalt on Georgia roads and encouraging the Georgia Department of Transportation to amend the state's construction specifications to include recycled tire rubber as an alternative to conventional polymers in asphalt production. As a result, Georgia will use millions of pounds of ground rubber derived from Georgia waste tires during the 2013 paving season.

Most significantly, the "Georgia model" for a rubberized asphalt campaign is being rolled out in other states to promote the use and benefits of rubberized asphalt. Wisconsin and Tennessee—states that, like Colorado, have virtually non-existent markets for rubberized asphalt—held informational meetings between November 2012 and May 2013 and are now moving forward with trials and demonstration projects.

The Colorado study's goal to promote and expand a rubberized asphalt industry in the state parallels another industry trend initiated on a national level in 2012. The Rubber Asphalt Foundation is a newly expanded group that offers an opportunity to address lingering questions on all rubber-modified asphalt. It is designed to work with Departments of Transportation and other stakeholders and could centralize information on all modified asphalts and help streamline and shorten the research phase of future projects. Among its goals, the foundation seeks to be a resource and catalyst for moving rubberized asphalt out of the "research/experimental" category to a paving product readily available to highway engineers and contractors.

The Colorado study also identified terminal blend paving as an opportunity for expanding rubberized asphalt. Terminal blend is one of the national trends identified to expand rubberized asphalt use. This technology is appealing to the asphalt industry because it blends rubber and asphalt at the asphalt production terminal, eliminating the need (and equipment) to blend and mix crumb rubber in the field. Terminal blend also has the potential to expand the use of crumb rubber in other non-paving asphalt products such as coatings, sealants, and asphalt shingle manufacturing.

### **Terminology**

How incentive recipients are defined has been a source of confusion, wrongful payments, and even fraud in some programs. Most U.S. incentive programs make no clear distinction in terms commonly defining ground rubber producers as end users. These programs also do not include tire-derived rubber

product manufacturers or other firms purchasing ground rubber to make new products in their definitions.

### Summary

Ground rubber production is both capital and equipment intensive. Finer rubber is more costly to produce than coarse ground rubber both from an operational cost (energy-intensive) and from a capital equipment cost. Currently two Colorado processors have limited capability to produce volume quantities of ground rubber in a range of sizes. Although Colorado has a well-developed waste tire collection, hauling and processing infrastructure, it is still developing the capacity and capability to produce a range of rubber feedstock sizes (crumb rubber, ground rubber, or mulch size rubber). In addition, the majority of processors in the state have not advanced their processing systems to include quality measurement, product controls or production efficiency. Most operate at primary and secondary processing levels.

New ground rubber markets have not developed or have been discouraged in Colorado because the processing capacity for the material is not available. This statement is borne out in the "Promoting Rubberized Asphalt and Other Waste Tire Products in Colorado" study (Amme, 2008). In addition, no markets in the molded and extruded market sector have developed in the state.

Experience in the nine states with incentive programs has shown that when processors become dependent on incentives, it limits creativity in seeking new markets, stifles improvements in the current infrastructure, and reduces the "incentive" to produce higher-value products. Processor incentives in Colorado should be evaluated to find new ways of assisting and encouraging processors to make improvements in processing to lower costs and produce end products that can compete in the marketplace. Industry stakeholders report that incentives directly benefit processors and end users by enhancing cash flow and thereby strengthening the overall profitability, competitiveness and vitality of their operations.

Between 1988 and 1998, nine U.S. states (including Colorado) implemented tire incentive programs mainly with a goal of cleaning up illegal tire stockpiles and developing in-state processing capacity to manage annual waste tire generation and creating end-uses. Four of these programs sunset by law after they achieved various levels of progress (Idaho, Oregon, Texas and Wisconsin), while five are ongoing (Colorado, Louisiana, Oklahoma, Utah and Virginia). Each program had some success in developing in-state markets and infrastructure and in launching TDF as a viable end use that is now a well-established market. Only two—Utah and Oklahoma—specifically promote crumb rubber in their programs.

The lesson emerging from these programs suggests that lower-value, high-volume end uses rise to the top and dominate the market, not allowing a diverse waste tire market to emerge. However, some states—Texas and Wisconsin, for example—have well-established tire management infrastructure with growing crumb rubber capacity that developed after their incentive programs sunset. Markets in Texas are especially strong, with eight TDF users, an established rubberized asphalt market, three existing crumb rubber producers, and one large new crumb rubber producer planning to startup in 2013.

It is important to note that of these nine incentive programs, no two are defined exactly alike and each one has singular characteristics that complicate making broad generalizations. Key differences include the types of eligible firms and market segments, incentive payment amounts, whether out-of-state firms are eligible, terminology, and the nuances of each program's rules.

In contrast to these state programs, Colorado is an anomaly. On a national basis, Colorado is identified by its monofills. As of 2011, more than 60 million waste tires were stored in tire monofills and legal stockpiles. In Colorado, placing tires in monofills for storage does not constitute final waste disposal. The state anticipates that tires stored in monofills will be reused later for tire-derived fuel; rubber crumb for roadways and molded rubber products, playgrounds, sports fields, or for other uses. This conclusion is supported by the recent change in ownership of the state's two largest monofills. One was purchased by a cement company that will process the tires for use as a supplemental fuel at its in-state kiln. Similarly, the new owners of the largest monofill have indicated that they are developing strategic alternatives for consuming all tires in the monofill.

Colorado already has an established infrastructure and end uses sufficient to handle tires generated annually. Going forward, the state will need to re-focus and re-align the goals of its waste tire program to increase diversion, strengthen crumb rubber production, diversify demand for recycled tires, and reduce storage of waste tires. Other related goals might focus on promoting the highest and best uses for tires and ensuring equity across the industry.

Markets remain an issue in all the states with incentive programs. TDF and TDA in landfill applications emerged as the strongest end uses for tires in all nine state programs. TDF continues as the strongest market in the five active state programs. Only Utah has significant crumb rubber processing capacity, but most of the crumb rubber produced in the state is sold out of state. Even under Ontario, Canada's highly subsidized incentive payment system, end use demand has lagged behind crumb rubber production and large quantities of crumb rubber are exported to U.S. markets.

None of the states has a strong diversity of end uses. In Louisiana, processors are taking the lead in developing a rubberized asphalt market. In Virginia, a new crumb rubber facility opened in 2011. It is only the second facility dedicated to producing crumb rubber to open in the state in more than 20 years. The company hopes to take advantage of recent state efforts to encourage rubberized asphalt. Several rubber-modified asphalt-modified demonstration pavements were laid in 2011 and 2012 as a result of a legislative push to consider the use of rubber-modified pavement as part of the state's quiet pavement program. Texas developed a rubberized asphalt market and crumb rubber processing capacity in the state after its incentive program ended.

Colorado's incentive program needs to be balanced and have oversight and review mechanisms to assure the best use of incentives in each market. One option is to target end user incentives to promote expansion in new market segments such as rubber-plastic molded products. Industry stakeholders and incentive program managers need to work together and look for creative ways to use incentives, including targeting incentives to specific market needs (quality assurance, education, and technical expertise) and finding partners to share or match incentives.

## 4.0 Opportunities for Expanding Beneficial End Use

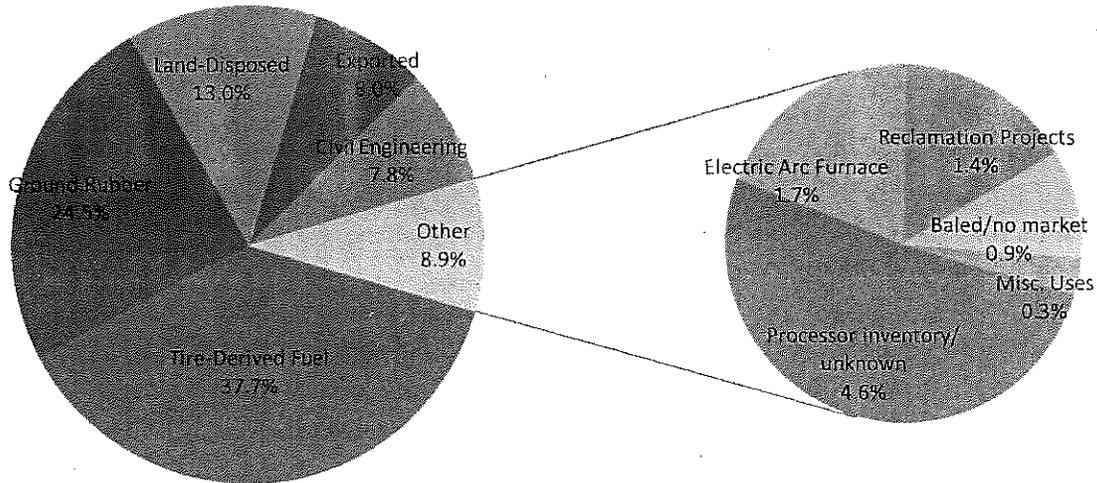
Waste tires began to be recognized as a resource in the 1990s. In addition to basic recycling objectives, a series of major stockpile fires encouraged states to initiate waste tire management programs to stop illegal disposal and create markets. Many tire processing methods and equipment components were tried, with mixed results. Market development efforts tested the limits of creativity and “credibility.” The long-term result has been development of diverse products and a tire processing industry capable of making these products. In a relatively short period of 15 to 20 years, waste tires have progressed from a disposal liability to a valuable resource with broad market penetration.

Figure 4 summarizes the U.S. markets for products derived from waste tires based on the most recent data compiled by the Rubber Manufacturers Association (RMA) in the U.S. (2011). RMA revised its reporting methodology by deducting used tires recovered from tire collections before waste tire generation and disposition would be defined. According to RMA, 265.8 million waste scrap tires were collected in 2011, representing 4.356 million tons. In total, 35.1 million tires (575,000 tons) were culled for resale. As a result, RMA considers actual waste tire generation to be the net difference, or 230.7 million tires (3.781 million tons). The following RMA charts and data are based on this net national waste tire generation in 2011.

TDF is recognized as a viable energy resource in the U.S. and consumes 37.7 percent of annual generation in about 100 facilities across the country. Approximately 24.5 percent of the tire-derived material was converted into ground rubber, ranging from large particles for mulch and playground fall protection to fine mesh crumb rubber for extrusion molded products and rubber modified asphalt. Civil engineering applications using TDA represented 7.8 percent of the material used.

Figure 3: U.S. Waste Tire Disposition 2011

## U.S. Scrap Tire Disposition 2011 (as percentage of total generation)



© Rubber Manufacturers Association, 2013. May not be used, reproduced or cited without proper attribution.

In addition to these major markets, 8 percent of the material was exported in 2011, mostly as bales to China through Vietnam in a practice that has diminished dramatically since mid-2012. Thirteen percent of the material was land-disposed and 8.9 percent was used in other smaller categories including electric arc furnaces (1.7 percent), reclamation projects (1.4 percent), baled tires with no markets (0.9 percent), miscellaneous uses (0.3 percent) and processor inventory/unknown 4.6 percent. In total, about 82 percent of the net waste tire generation was constructively utilized and most of the remainder of the material was properly disposed of or managed. In addition, 13.2 percent of gross waste tire collections were sorted for resale and deducted from generation before calculation of the other market percentages as previously noted.

The following sections summarize the characteristics, volumes, benefits, and issues associated with each of these major market segments. Historical development, current status, market potential and accelerators that deserve consideration for increasing each market in Colorado are discussed.

### 4.1 Current Market Perspective

This section discusses the top eight opportunities for increasing beneficial end use capacity of waste tires in Colorado.

#### 4.1.1 Alternative Energy Resource (TDF)

Waste tires have been used as a supplemental energy resource in Japan, Europe, and the U.S. since the 1970s, and it is the largest end use application for waste tires in most of these countries. TDF was the cornerstone of initial market development in many waste tire management programs and remains an important component even as efforts have continued to develop applications that use the materials value of the rubber. The sheer volume of waste tires generated annually in the U.S. forces broad market diversification to maximize constructive utilization that could not be achieved without substantial TDF markets.

The chemical characteristics of any energy resource affect its technical and environmental performance. Tires are a hydrocarbon-based material derived from oil and natural gas. Some inorganic materials are added to enhance vulcanization reactions or performance properties such as flexibility and resistance to ultraviolet light. Tires have a heat content of 14,000 to 15,500 British thermal unit (Btu)/pound, depending on the type of tire and degree of reinforcing wire removal. By comparison, coal that may be displaced by use of tires typically contains 8,000 to 12,500 Btu/pound.

The composition of tires and coal varies depending on type and source. However, Table 8 provides representative proximate and ultimate analyses of TDF with about 90 percent of the reinforcing wire removed, a northeastern bituminous coal, and a western sub bituminous coal used to generate steam. Proximate analysis defines basic combustion characteristics. Ultimate analysis defines elemental composition.

**Table 8: Comparative Chemical Characteristics of Tire Derived Fuel to Coal**

<b>Characteristic</b>	<b>Bituminous Coal-Northeastern US</b>	<b>TDF (90+% Wire Removed)</b>	<b>Subbituminous Coal-Western US</b>
Moisture (% As Received)	10.43	0.62	24.68
Heating Value (BTU/Pound, as Received)	10,641	15,404	9,287
Proximate Analysis (% Dry Basis)			
Ash	16.16	4.81	6.37
Volatile Carbon	38.14	67.06	44.43
Fixed Carbon	45.70	28.13	49.20
TOTAL	100.00	100.00	100.00
Ultimate Analysis (% Dry Basis)			
Carbon	65.49	83.79	70.73
Hydrogen	4.56	7.13	4.85
Nitrogen	1.11	0.24	0.84
Sulfur	4.52	1.84	0.41
Ash	16.16	4.81	6.37
Oxygen (by difference)	8.16	2.18	16.80
TOTAL	100.00	100.00	100.00
Ultimate Analysis Expressed as Pounds/Million Btu			
Carbon	55.13	54.05	57.36
Hydrogen	3.84	4.60	3.93
Nitrogen	0.93	0.16	0.68
Sulfur	3.81	1.19	0.33
Ash	13.61	3.12	5.17
Oxygen (by difference)	6.87	1.42	13.62
SUBTOTAL	84.19	64.54	81.09
Moisture	9.80	0.40	24.68
TOTAL	93.99	64.94	105.77

A comparison of the proximate analysis indicates that tires offer efficiency advantages versus coal. For instance, tires generally have lower moisture content than coal. Since the energy required to heat and vaporize water is often non-recoverable in the energy conversion process, lower moisture content can translate into higher combustion efficiency. Lower ash content of TDF (without wire) offers another advantage versus coal and can decrease ash disposal costs. A tire's higher volatile-to-fixed carbon ratio enhances its ability to combust rapidly and completely. TDF's advantages become commanding when

compared with some high-ash, low-Btu coals and lignite. This advantage is particularly true in cement plants, where the waste tire ash constituents are incorporated into the cement product. Based on proximate analysis, tires compare favorably with coal as an energy source.

Based on ultimate analysis, tires offer some additional advantages and disadvantages. When compared with many eastern coals, TDF's lower sulfur content (especially in terms of pounds/million Btu) offers the potential advantage of decreasing emissions of sulfur oxide compounds referred to as SO<sub>x</sub>. However, many western coals have lower sulfur content, so SO<sub>x</sub> must be controlled within these systems to prevent an increase with TDF.

Combustion systems burn less of a high-energy fuel to obtain the same amount of energy, so expressing the ultimate analysis as pounds per unit of energy (Btu) identifies some other important environmental factors. Combustion of TDF generates less carbon per Btu than either coal summarized in Table 8. Since carbon converts to the greenhouse gas carbon dioxide during combustion, TDF reduces emissions of carbon dioxide compared with these coals. TDF also has higher hydrogen content. When hydrogen combines with oxygen during combustion, it releases energy and forms water with no greenhouse gas. Therefore, TDF's lower carbon and higher hydrogen content on an energy basis results in lower greenhouse gas generation. In addition, TDF's lower nitrogen content can decrease emissions of nitrogen oxide compounds called NO<sub>x</sub>.

Tires generally contain metals at concentrations comparable to, or lower than, coal, with one notable exception. Zinc is added to tires as part of the rubber vulcanization process at levels approaching 1.0 to 1.5 percent by weight. Therefore, zinc levels in tires are higher than coal. Applications using tires as an energy resource must be able to control zinc emissions to avoid a negative environmental impact. Common air pollution control equipment such as electrostatic precipitators and baghouses effectively control zinc oxide emissions from TDF combustion.

From a chemical standpoint, tires offer both environmental advantages and disadvantages versus coal. Therefore, tires can provide a valuable and environmentally friendly energy resource when used in applications that draw on their advantages and properly control their disadvantages.

All suitable facilities have the following characteristics:

*Solid Fuel* – Tires can be used whole in some applications such as cement kilns. Others require tires to be shredded into TDF, with reinforcing bead and cord wire removed if necessary. Regardless of particle size, tires remain a solid fuel, so applicable systems must be able to receive and combust solid fuel to be a candidate for TDF use. However, the energy from TDF can replace higher-cost oil and gas in some cases where oil, gas, and solid fuels are co-fired in the same furnace.

*Complete Combustion* – Appropriate applications must have a combination of air/fuel residence time, combustion temperature profile, and air turbulence to assure complete combustion.

*Emissions Control* – Appropriate facilities must have emissions systems capable of controlling any changes in SO<sub>x</sub> and particulate within environmentally sound permit limits.

## Perceptions and Issues

Evaluation of TDF for specific applications involves consideration of the following technical, operational, environmental, regulatory, economic, perception, policy, and market issues:

*Technical Issues* – Many technical issues must be evaluated to assess the suitability of using TDF in specific applications, including fuel handling, combustion conditions, ash handling and disposal, and emissions control capabilities. In general, most cement manufacturing facilities, some specific types of power plants (most circulating fluidized bed boilers, and some cyclone-fired power boilers), and some wood burning stoker-fired boilers are worthy of consideration.

*Operational Consistency* – Operational consistency is a critical parameter in controlled combustion, so TDF is normally metered into the combustion unit by a suitably designed and demonstrated metering unit. The unit is electronically tied to the control room and control system to assure proper operation.

*Environmental Factors* – In appropriate applications, many emissions parameters are monitored and tested. Some decrease or increase marginally with TDF usage, but the overall impact is not significant and remains within established permit limits. This performance has been demonstrated by more than 20 years of usage involving at least 100 facilities in the U.S. Any new applications must be confirmed by performance testing and continuous monitoring of major environmental parameters. TDF should be used only in facilities capable of maintaining environmental performance in compliance with all applicable regulations and permits. As previously discussed, TDF can actually result in reduced greenhouse gas emissions versus displaced coal.

*Regulatory Considerations* –The US EPA has recently promulgated a Non-Hazardous Secondary Materials (NHSM) rule (40 CFR 241) providing the standards and procedures for identifying whether NHSM are solid waste under the Resource Conservation and Recovery Act when used as fuels or ingredients in combustion units. Under this rule, waste tires that are managed under the oversight of established tire collection programs, including tires removed from vehicles and off specifications tires, were given a non-waste determination for specific Non-Hazardous Secondary Materials when used as fuel. As a result, use of these waste tires as a fuel has not been impacted and they can continue to be combusted in appropriate applications either in whole or shredded form under Section 112 provisions of the Clean Air Act.

However, tires retrieved from stockpiles are considered to be solid waste and must be shredded with removal of loose wire liberated during processing to continue to fall under Section 112 provisions. Use of whole tires retrieved from stockpiles will fall under the more stringent provisions of Section 129 of the Clean Air Act governing solid waste combustors. Some cement kilns are the only major energy users consuming whole tires. They may continue to use whole or shredded waste tires managed under an established tire collection program and remain under Section 112. However, use of whole tires from stockpiles will require compliance with Section 129 provisions of the Clean Air Act unless the company successfully petitions EPA for designation of these tires as non-waste. The overall conclusion is that the NHSM rule will have no impact on the use of tires as an energy resource as long as they use shredded tires with free wire removed or whole tires managed under an established tire collection program.

*Economic Considerations* – TDF substitution for traditional fossil fuels is generally driven by energy savings, enhancing the economic viability of some facilities in today's globally competitive market and contributing to job preservation at these facilities.

*Public Perception* – Tire stockpile fires generate massive amounts of dense black smoke and noxious fumes from incomplete combustion as a result of oxygen starvation at the surface of the fire. This uncontrolled combustion is totally different from carefully controlled combustion in industrial applications. Industrial applications are designed, controlled, and monitored to achieve complete combustion and to control emissions. In the absence of technical understanding, some people maintain the perception that TDF use will result in black smoke and dangerous emissions.

*Policy* – Some states have chosen to evaluate potential markets based on program needs, allowing TDF to absorb stockpile abatement tires or incremental generation while markets utilizing the materials value of rubber are developed. TDF decreases low-value uses such as daily cover or soil substitution where TDA offers no technical advantage.

*High Value Market Transition* – One concern about TDF use is the perception that other markets will not be developed if TDF is allowed. However, economics dictate that waste tires flow from TDF to civil engineering markets as applications using rubber's materials value are developed. Higher revenue draws tires to higher value products naturally, as has been proven repeatedly in practice.

### **Applicability**

Whole or shredded tires can be used as an energy resource. Examples of facilities that have demonstrated their ability to use TDF in compliance with all applicable regulations are discussed in the following sections.

#### **4.1.1.1 Cement Manufacturing Kilns**

*Conceptual Usage* – Cement manufacturing consumes massive amounts of energy to heat a complex mixture of raw materials to more than 1400 degrees Centigrade. Whole or shredded tires can be injected into the cement process at several points to increase energy efficiency and decrease NOx generation. TDF usage is one of the approved technologies for NOx reduction in California cement plants and by the USEPA (USEPA, 2012). Tires have been used successfully in all major variations of cement manufacturing processes. Reinforcing wire in tires provides a raw material required in cement, thereby reducing iron purchases.

*Current Market Position* – The use of TDF as a supplemental energy resource in cement production is the largest current application in Colorado. There are three major cement manufacturing facilities in Colorado.

- Holcim (US) Inc. – Tires are currently processed at the Geocycle facility in Colorado Springs and then used at the Holcim cement plant in Florence, Colorado. Holcim has demonstrated a commitment to creating a consistent market for waste tires and exploring opportunities to

expand usage as its production volumes rebound from the negative impact of the recession and associated housing slowdown. The company may also examine other opportunities to increase usage at existing production rates by displacing additional coal.

- GCC – GCC has been permitted to use shredded tire chips in its kiln in Pueblo, Colorado. It has purchased the nearby Midway Monofill and is exploring options for retrieving and processing tires from the monofill for use in its kiln. If tires are available from ongoing generation, GCC may also use them to supplement monofill tires to optimize its utilization of this resource. GCC's usage could substantially abate the monofill within 7 to 10 years. By initially removing tires from appropriate areas, the monofill's environmental risk could be significantly reduced within several years. The GCC plant plans to begin using tire chips as a fuel in 2013.
- CEMEX – The CEMEX plant in Lyons, Colorado conducted TDF trial usage in 2002 and 2003, developing an environmental performance data base and a detailed analysis of the environmental and health impact associated with TDF usage. The facility has made additional capital and operational changes since then that may further enhance environmental performance. Use of TDF could offer substantial economic benefit to the plant and could improve its financial viability in today's challenging business climate. The CEMEX plant is located within 35 miles of the large monofill north of Hudson, Colorado, and could offer a logistically and environmentally sound application for some monofill tires if the current monofill owner (CH2E), CEMEX, local and state regulatory agencies and residents recognize that it would be beneficial to all parties to re-evaluate possible use of TDF at the facility.

Potential Usage – Use of TDF in cement kilns is a cornerstone of Colorado's waste tire management program and may be able to further improve utilization of ongoing generation tires. In addition, GCC intends to abate the Midway monofill by producing and using TDF from monofill tires. CEMEX could play a role in constructively utilizing on-going generation tires and abating the Hudson monofill if its participation is warranted and acceptable to involved stakeholders.

#### 4.1.1.2 Power Generation Facilities

Conceptual Usage — TDF has demonstrated its environmental and technical performance when it has displaced coal in certain types of power boilers, such as fluidized bed, cyclone, and some stoker-fired power boilers. These boilers have combustion conditions conducive to complete combustion of economically-produced TDF particle sizes. Large wall-fired and tangentially-fired units require smaller TDF particles that currently cannot be produced at costs competitive with coal in Colorado. Smaller biomass-fired facilities can be candidates to use TDF if they require supplemental fossil fuel to maintain optimal combustion conditions and efficiency.

Large Power Boilers – Nineteen large coal fired power boilers were identified in Colorado, but all are wall-fired or tangentially fired. These units do not have sufficient particle residence time to allow complete combustion of nominal 1-inch-sized TDF. Since the cost to produce smaller TDF escalates dramatically, TDF currently cannot compete economically with coal in these boilers. Based on available references, no large utility boilers appear to be candidates for TDF usage in Colorado at this time.

Fluidized-bed Boilers – Fluidized bed boilers have an excellent combination of temperature, turbulence, and residence time to assure optimal combustion conditions. The limestone fluidizing medium enhances temperature uniformity within the bed and scrubs sulfur by contact with combustion gases.

These units are environmental leaders, but only three comparatively small units were identified in Colorado. Based on initial exploratory discussions, each of the units has technical or economic issues (or both) that will probably preclude use of TDF at this time. However, future market development efforts should include more detailed discussions and possible site visits to fully explore possible use.

Biomass Boilers – Some boilers combust bark, wood waste, or other biomass materials to generate steam and power. Paper mill power boilers commonly use TDF as a supplemental energy resource. Wood absorbs moisture during rainy periods and can be difficult to combust fully. The high energy content of TDF serves as an octane booster to enhance boiler performance and complete combustion. TDF generally displaces supplemental fossil fuel usage, often oil, coal, or natural gas. There are currently no paper mill power boilers in Colorado or nearby states. However, there are some smaller biomass units that should be explored in more detail during future market development efforts. These units derive economic and tax benefits from using renewable energy resources, and TDF is not currently recognized as a renewable energy resource in Colorado. Tires contain an average of 28 percent natural rubber that is considered a renewable material. As a result, the federal government has recently recognized TDF as 28 percent renewable, a factor that could be important if TDF displaces fossil fuels as a supplemental energy resource in these facilities.

#### 4.1.1.3 Steel Production (Electric Arc Furnaces)

Some U.S. and foreign steel production facilities have used cut tires as a source of carbon in steel manufacturing. Tires contain about 30 percent carbon black (elemental carbon), and the remaining energy content is beneficial in this energy-intensive production process. A large steel production facility was identified in Colorado, and a preliminary discussion indicated that there may be an interest in continuing to explore the technical and economic feasibility of using TDF to displace some coke purchases. Use of waste tires in steel production is generally considered a higher-value use than traditional TDF because the elemental carbon in tires is effectively reused to enhance performance properties of the steel. Facilities have typically used 250,000 tires or more annually.

#### **Market Development Plans and Accelerators**

TDF is the largest existing application for waste tires in Colorado and offers potential for significant expansion. It is important for Colorado to have diverse markets and not totally depend on one use, but energy utilization will be required to play a major role in abatement of Colorado's monofills and other stockpiles. TDF is one of the few markets that can be developed relatively quickly and can continuously consume large quantities. Within the framework of annual generation, additional TDF usage would displace baling and reduce pressure for excessive daily cover usage and accumulation. It may be enhanced by its role in abating major identified monofills and any stockpiles identified in the future.

Future TDF market development efforts should focus on the specific market segments offering identified potential.

1. The cement industry is experienced and knowledgeable in TDF usage, but best practices can still be implemented on a wider basis across the industry to maximize the use and benefit of TDF.
2. The prospect of TDF usage can provoke public reaction. Providing data and an unbiased perspective to interested groups has provided a forum for discussion based on fact. Candid discussion of positive and negative factors can provide a sound foundation for constructive plans reflecting the concerns of stakeholders.
3. Fluidized bed boilers should be fully explored. Operational limitations, rigorous TDF specifications, and low coal competitive prices decrease the probability of usage in Colorado, but there have been good technical, economic, and environmental applications for TDF in other areas of the country.
4. Existing and planned biomass boilers should also be fully explored. If appropriate based on this evaluation, official recognition of TDF's renewable energy component in Colorado may help accelerate use of TDF as a supplemental energy resource in these facilities.
5. Additional on-site discussion should be conducted with the Colorado steel manufacturing industry to assess the technical, environmental, and economic viability of using TDF as a carbon and energy resource.
6. If Colorado's waste tire management program is modified to create a larger Market Development Fund, competitive grants could be used to reduce barriers to additional TDF market development. Examples could include:
  - Sharing the cost of environmental trials to assure the performance of new or modified applications.
  - Sharing the cost of metering systems or necessary end user facility modifications to reduce economic hurdles during initial or increased implementation. In general, this assistance is granted initially as a loan and is converted into a grant based on actual tire usage. These grants have proven effective in accelerating development of sustainable markets that continue without on-going subsidies.
7. Providing technical assistance has historically allowed potential end users to gain an understanding of and evaluate potential TDF usage. The Tetra Tech team has successfully served this function in support of other state and federal market development programs. Actual time expended in support of each potential end user is normally limited, but it can accelerate their learning curve.

#### 4.1.2 Pyrolysis

Pyrolysis is, by definition, thermal decomposition of organic compounds in an oxygen-limited environment. Promoters have called their pyrolysis processes thermal distillation, destructive distillation, and many other names to avoid identification with pyrolysis.

Pyrolysis of waste tires typically generates gas, oil, and char products. The quantity and quality of each product depend on many process variables, including temperature, pressure, and residence time. Twenty to 35 percent of a tire's energy content is typically converted into a combustible gas that is used to fuel the pyrolysis process or is combusted in a flare prior to release. Thirty-five to 50 percent of the output from the process is transformed into an oil product that varies in quality from saleable fuel oil to

lower-value oil blend stock. The residual solid product (referred to as char) constitutes 25 to 40 percent of the output and contains a mixture of the following materials:

- Multiple types of carbon black used in various sections of a tire for strength, wear, or other critical performance properties;
- Titanium dioxide from white sidewalls and lettering in older waste tires;
- Zinc dispersed uniformly within tires as a vulcanization accelerator;
- Steel from bead and radial reinforcement wire;
- Other inorganic chemicals.

Pyrolysis is not a new process. It was developed in Europe more than 60 years ago to transform coal into gas for street lamps. Over the past 25 years, many processes, equipment, and operating variations have been applied to waste tires. A U.S. Department of Energy publication titled "Scrap Tires: A Resource and Technology Evaluation of Tire Pyrolysis and Other Selected Alternate Technologies" identified 31 pyrolysis projects in 1991 that used fluidized beds, traveling grate chambers, rotary kilns, retorts, molten salt and hot oil baths, plasma arc units, and microwave chambers as reactors. Various operating conditions have been extensively explored to optimize production and quality of product streams. In spite of this extensive developmental effort, no commercial-scale pyrolysis systems currently operate continuously in North America. For this reason, any grant requests for pyrolysis projects should be thoroughly vetted.

Extensive technical and economic resources (an estimated \$300 million) have been invested in projects developed by major companies such as Goodyear/Tosco (The Oil Shale Co.), Firestone, Occidental, Uniroyal, Nippon, and Foster-Wheeler. In addition, many pilot or "demonstration" projects have been developed by smaller companies and entrepreneurs. One major project developed by Foster-Wheeler in England (called Tyrolysis) failed technically and economically after expenditures exceeding \$30 million.

Major reasons for failure of pyrolysis projects have included the following:

- **Operating Problems:** Utilizing complex equipment at high temperatures with an abrasive feedstock such as waste tires is generally maintenance-intensive. Downtime and maintenance expenses have often been underestimated in projections of total project costs.
- **Safety:** Operating in an oxygen-limited, high-temperature environment creates the possibility of fires or explosions if air enters the system accidentally. These accidents have destroyed or damaged numerous pyrolysis facilities, including complete destruction of the \$6 million Intenco operation in Texas.
- **Feed Availability and Processing:** The scale required for economic feasibility can require more tires than are available within an economical delivery area at projected net tipping fees. In addition, capital and operating costs associated with shredding or feed preparation have often been underestimated.
- **Product Quality:** It is difficult to optimize quality and yields of three inter-related product streams (gas, oil, and char) since conditions favoring one often have a negative impact on

another. Because of the mixture of carbon blacks and other constituents, the char has historically been suitable for only low-value applications with limited market volumes, even when the char is further processed to control size uniformity and iron content.

- **Environmental Impact:** Tires contain about 1.8 percent sulfur and 1.0 to 1.5 percent zinc, by weight. These inorganic materials are not destroyed or decomposed thermally, so they remain in one or more of the pyrolysis products as defined by an elemental mass balance for specific operating conditions. In addition, partially decomposed hydrocarbons may not be fully removed from the exhaust gas stream by condensation or combustion. As a result, pyrolysis units must have air pollution control systems to prevent discharges to the environment. Pyrolysis promoters often claim that their process has no emissions because all materials are captured as products. However, the gas product is generally combusted to fuel the process or flared on site because it cannot be transferred in normal gas transmission lines. In either case, combustion creates emissions that require controls to comply with clean air standards in the U.S. In addition, the char product may require disposal as a hazardous waste if it is not marketable. These practical realities should be reflected in capital and operating cost projections, but rarely are.
- **Economics:** The economic feasibility of pyrolysis depends on many operating factors such as system reliability, capital and labor costs, process, feedstock preparation expense, environmental control requirements, and product revenue. Past operations have not been economically sustainable at reasonable tipping fees because they have not been able to develop high-value (greater than \$0.20 per pound) markets for all of the char generated. The materials recovery appeal and economic viability of this process are dependent on high-value application of the carbon black content of the char stream. Unless this objective is achieved, pyrolysis simply becomes a capital-intensive process for conversion of a viable solid fuel into a low-grade liquid fuel, while wasting up to 70 percent of its initial energy content.

There are many companies promoting pyrolysis systems within North America. None of these technologies has been practiced on a continuous commercial scale for an adequate period of time to fully demonstrate long-term operating economics and char marketability. Most of these companies, like the many failures before them, claim technical improvements that overcome historical failures.

Some proponents identify multiple processing steps intended to improve particle size uniformity of the char product. However, the pyrolytic char does not retain the structural reinforcing properties of virgin carbon blacks used in tires and other performance applications. Size reduction and particle size classification will not restore these critical properties. High metals content and residual organics from decomposition of rubber polymers further limit potential markets for the char product. Historical experience dictates that actual markets should be specifically defined and supported by verifiable contractual commitments before any future investment in "commercial" pyrolysis technologies.

The USEPA has recently required pyrolysis producers to classify and register its products under Toxic Substances Control Act (TSCA) provisions. Only one pyrolysis facility has complied with TSCA requirements so far. Demonstrating compliance can be a costly and time-consuming challenge.

Without proper compliance, the pyrolysis facility and its customers are subject to substantial fines and penalties.

A waste tire pyrolysis facility has been constructed in Colorado Springs by Recycledfuel Company. The equipment was purchased from China and installed in a commercial/industrial warehouse area. The company has not yet obtained all of the permits required to initiate operation. The facility is reportedly able to process more than 1 million tires/year, but no actual projection can be made until all permits have been obtained and performance has been demonstrated. This small facility faces limited resources and substantial hurdles to overcome before it is demonstrated as a viable long term business.

Hudson Tireville has recently been purchased by CH2E, a relatively new company that has announced planned construction of a pyrolysis facility in Las Vegas. The facility reportedly is designed to process up to 20 million tires/year, as well as other organic materials, at a construction cost of about \$25 million. CH2E was contacted during this study. Company representatives indicated that they have not yet fully developed their strategy for the Hudson site, but they have several technologies available and their goal is to use the tires in the monofill within a reasonable period of time. Their plans should become more apparent with time and have a significant impact on long-term development of the waste tire market and the use of pyrolysis in Colorado.

#### 4.1.3 Tire Derived Aggregate

A broad range of civil engineering applications use substantial quantities of TDA in the U.S. It is the third largest market (behind TDF and crumb rubber), using 7.8 percent of generation in 2011, according to the RMA.

TDA is a term coined by Dr. Dana Humphrey, Dean of the School of Engineering at the University of Maine and a major contributor to development of TDA applications and data. His objective was appropriate recognition of shredded tires as an engineered product made by cutting waste tires into 1- to 12-inch pieces. TDA has unique properties that make it suitable for use in a wide range of geotechnical challenges, including:

- **Light Weight:** Approximately 50 pounds per cubic foot, a fraction of the weight of traditional aggregate materials. TDA has been used as an economical lightweight fill in highway embankments in 13 states and most recently in New Brunswick, Canada.
- **Compressibility:** Produces low lateral pressures on walls (as little as one-half that of soil) and has demonstrated vibration absorption properties for use under urban rail tracks and new light rail systems.
- **Low Thermal Conductivity:** TDA transmits heat or cold poorly, making it a good thermal insulator (up to eight times better than soil), and allowing it to retard frost penetration in road bases or around home foundations.
- **High Permeability:** Permeability of more than 1 foot per minute allows liquids and gases to pass through TDA rapidly, making it an effective drainage medium under roadways, along highway edge drains, around house foundations, in French drains, in septic system drain fields, and in landfill drainage and gas collection systems.

- **Good Shear Strength:** Enhances strength and stability when placed in large applications such as roadway embankments, and absorbs vibrations.

When used in appropriate applications, TDA's properties can greatly reduce construction costs. Guidelines and construction specifications are available to help engineers take advantage of the special engineering properties of TDA. Most important of these is ASTM International Standard D6270-98 (Ref. 3), Standard Practice for Civil Engineering Applications of Scrap Tires (<http://www.astm.org/Standards/D6270.htm>). This document lists the typical geotechnical properties of TDA, applicable test methods, and construction guidelines.

TDA can be used as a substitute for conventional drainage aggregate for a wide range of applications. This material is advantageous when conventional aggregate is more expensive or is unavailable. Potential drainage applications include:

- Drainage layers within landfill leachate collection and removal systems
- Permeable aggregate for landfill gas collection layers and trenches
- Free draining aggregate for edge drains for roadways
- Permeable backfill for below-grade exterior walls
- Septic system drain fields

In addition, TDA is used in lightweight fill applications where its low density offers significant economic advantage, such as:

- Lightweight fill over unstable underlying soils, particularly in coastal and basin areas
- Stabilization of landslide areas
- Retaining wall backfill where TDA offers light weight, good drainage, and low lateral pressure.

### **Perspective and Issues**

Multiple factors influence the use of and market for TDA, including:

- **Economic Applicability** TDA has been economically used for a wide range of applications in the U.S. The economics of using TDA depend on the local cost of TDA and competing alternative construction materials. TDA is generally cost competitive for projects that require use of lightweight fill material for embankment construction. It can offer economic advantages in applications using its thermal insulating and vibration dampening properties. TDA can also be cost-effective in drainage applications where the supply of conventional drainage aggregate is limited. TDA is not, however, generally a cost-effective substitute for conventional earth fill. This usage is sometimes represented as a constructive use, but is more accurately just lineal landfill disposal.
- **Stockpile Requirements:** Many civil engineering projects require large quantities of TDA for placement in a short period of time, so the material has to be stockpiled at the processor or construction site for use. Since TDA can be ignited, storage should follow International Fire Code and local Fire Marshall requirements to minimize the probability and environmental

consequences of any such event. Since most construction is seasonal, storage can be for extended periods. Project delays and cancellations can further compound storage concerns. Firm project commitments prior to TDA production and proper storage design can minimize these concerns.

- Leaching of Metals and Organic Materials Contained in TDA: TDA contains metals such as iron and manganese in reinforcing wire and zinc within the polymer rubber matrix. All of these metals occur naturally in soil, often at levels greater than in tires. Exposed wire can dissolve in time, gradually introducing these materials into the surrounding soil. Zinc and organics are less prone to leaching in large TDA particles because they are contained within the rubber itself and do not readily migrate to the surface under normal environmental conditions. Several studies have also shown that TDA has negligible impact on groundwater. A statistical analysis of the effect of TDA on groundwater is presented in "Literature Review of the Water Quality Effects of Tire Derived Aggregate and Rubber Modified Asphalt Pavement" Humphrey and Swett, 2006). Many states limit TDA applications to above the mean water table to further control leaching potential. Florida also limits septic drain field applications to residential systems to avoid extreme pH conditions that could increase leaching in some commercial systems.
- Auto-ignition: Deep piles of compacted tire shreds have auto-ignited during storage and use in some roadway construction. The mechanism is not fully identified, but most examples have had the following common characteristics: (1) deep piles in excess of 12 feet, (2) compaction by movement of heavy equipment on top of the pile, (3) exposure to wet conditions, (4) the presence of contamination or fines within some piles, and (5) concentrated areas containing wire or fluff in some piles. As a result, proper storage and use of TDF avoid these common characteristics by limiting depth to 12 feet or less, avoiding compaction in storage piles, assuring water drainage from pile areas, and preventing contamination with wire, fluff, fuel, or fines. Design criteria are discussed in more detail in the previously referenced ASTM Standard for Civil Engineering Applications.
- Cash flow: Year-round production and seasonal sales of TDA products require substantial inventory accumulation that can increase working capital requirements. Variations in cash flow can alter business plans.

TDA has a well-developed design data base and broad proven applicability in civil engineering applications in the U.S., but Colorado's experience has been limited. TDA has been used as a vibration dampening sub-base under Denver's Regional Transportation District (RTD) light rail lines. Highway cone support rings cut from passenger and truck tire side-walls are made and used in Colorado.

The biggest challenge to TDA use is educating highway engineers about its design characteristics and demonstrating its performance in actual long-term installations. Gaining acceptance for new materials is a challenge. There is a natural reliance on proven materials and design practices, and an even more natural reluctance to try new ones.

Colorado has limited experience with civil engineering applications for tire-derived aggregate. Discussions were conducted with the Colorado Department of Transportation (CDOT), CDPHE, and representatives of major landfill companies to define existing applications and opportunities for market

development. Based on these discussions, the following is a brief summary of findings and suggested steps regarding highway applications and developing major TDA market segments:

#### **4.1.3.1 Highway Applications**

There are a broad range of appropriate uses for TDA in highway construction that takes advantage of its unique design characteristics. Some roadway embankment projects in California, Maine, Virginia, and New Brunswick, Canada, have used more than 500,000 waste tires and have saved hundreds of thousands of dollars versus other lightweight fill alternatives. Use of TDA in retaining wall backfill, edge drains, and frost heave prevention are gaining acceptance because of savings. CDOT has expressed interest in increasing its understanding of TDA, its applications, and its potential savings.

#### **Market Development Plans and Accelerators**

1. Since education is a critical first step in defining and developing applications for TDA, CDOT and CDPHE have discussed initiating a cooperative effort to offer one or more educational seminars covering TDA design characteristics, practical examples, and long-term results. Sessions could range from a 1 to 2 hour broad overview for management personnel to a 6 to 8 hour short course for design engineers. Value may be maximized by including CDOT central and regional engineers as well as appropriate county engineers. Multiple sessions could be conducted as warranted.
2. The second step is identification of specific projects that could use TDA on state, county, or city projects. Once identified, a recognized expert could be engaged to assist the design team in evaluating the applicability of TDA and incorporating TDA into the design as appropriate.
3. Continuing assistance could be provided TDA specifications, procurement, staging, and installation as appropriate to make initial experiences comfortable and successful.
4. If a larger grant program is initiated, competitive grants could be requested to support demonstration projects and document actual installation under Colorado conditions. If possible, it can be desirable to encourage design engineers to visit these projects during construction.

#### **4.1.3.2 Landfill Applications**

There are also a broad range of applications for TDA in modern landfill design and operations. TDA's high permeability makes it suitable for leachate drainage layers and gas collection channels (both lateral, vertical and top). It can also be used to contour the top slope of old landfills prior to final closure. Although Colorado's landfill management companies have extensive corporate experience with TDA use in a variety of applications, its primary use in Colorado has been daily cover.

#### **Market Development Plans and Accelerators**

The market development plans for landfill TDA applications are similar to the previously discussed highway steps and could involve the same experts. The main difference is that this is a smaller design and operations group, so the initial educational sessions may best be structured to provide TDA design characteristics, practical examples and long term results, followed by discussion among private sector, public sector and CDPHE engineers about the viability of alternatives in Colorado. A foundation for

future use could be developed by discussing appropriate steps in permit modification and required demonstration.

The remaining steps would be similar to highway applications steps 2 through 4. Some grant requests may involve relatively small amounts to support preparation of required permit modification documentation by landfill design consultants. Operators have limited manpower and financial resources for preparation of such documentation, so assistance could significantly accelerate TDA usage in applications other than daily cover.

### **On-site Waste Water Treatment Systems**

TDA has been used extensively as an alternative aggregate in on-site septic system drain fields and channels. The science was pioneered at North Carolina State University and has been used extensively in many states including South Carolina, Vermont, and Florida. Its light weight offers economic and practical advantages in transportation and labor efficiency versus natural aggregate. Its greatest use is in areas with limited availability of aggregate. On a national basis, alternative technologies appear to be displacing aggregate of any type. Infiltrators have become the prevalent technology used in Colorado and reportedly offer installation advantages. Although this application does not appear to offer significant potential, several additional discussions should be conducted with installers, including areas with limited aggregate availability. These discussions will dictate any subsequent market development.

#### **4.1.4 Ground Rubber**

Nationally, ground rubber (or crumb rubber) applications consumed 764 million pounds of rubber derived from 56.6 million waste tires in 2011. This amount represents a 38.2 percent increase in the ground rubber market segment since 2005, according to the RMA's 2011 Scrap Tire Market Report (RMA 2011). In 2005, ground rubber markets consumed 553 million pounds of ground rubber. The major increases for the ground rubber were in for use in sports surfacing, landscape mulch, and molded and extruded products.

Ground rubber is derived from two major sources: tire buffings and processed whole waste tires. Tire buffings, a byproduct of the retreading process, are credited with being the inspiration for many of today's recycled rubber products and applications. Molded rubber products have been made from tire buffings for more than 20 years. Once the primary feedstock for manufacturing ground rubber, tire buffings continue to be used in molded and bound rubber products, pour-in-place surfaces, landscape mulch mixes, and more.

An estimated 250 million pounds of buffings are generated annually in the U.S, according to the RMA. This estimate has held steady since 2007. In 2011, the U.S. tire retread industry reported truck tire retreading increasing by 13 percent over 2010 (TRIB 2013). This trend has continued and truck tire retreaders expect increases in 2013 as consumers seek cost savings in challenging economic times. About 150 million pounds of tire buffings are also imported from Canada each year, for a total U.S. supply of 400 million pounds annually (RMA 2011).

Processing whole waste tires into ground rubber involves size-reducing the tires in a multi-stage process using shredders, granulators, and sophisticated separation machinery and systems for removing fiber, steel, and other contaminants. Generally, crumb rubber produced by reducing waste tires falls into sizes ranging from 3/8 inch to 40 mesh particles. Finer grades of ground rubber, from 40 to 200 mesh, typically require secondary and tertiary processing.

Identifying the ground rubber market for waste tires poses particular challenges that make it difficult to provide accurate estimates for the sources of ground rubber and the products and applications that consume ground rubber. Most state agencies do not track this information. Moreover, the major ground rubber processors do not all track the entire market or define ground rubber applications the same way. For example, some sources may include tire buffings in market numbers, while others do not. Additionally, some define ground rubber as coarse material generally ¼ inch or greater in size, and some define crumb rubber as fine material generally of 4 mesh or smaller (Scrap Tire & Rubber Directory, 2013).

Ground rubber is used in a wide variety of applications and products, from flooring and roofing to athletic surfaces and landscape mulch and as an ingredient in asphalt pavement. Overall, applications for ground rubber fall into six major market segments: athletic/recreational surfaces; molded and extruded products; rubber modified asphalt and sealants; tires and automotive; landscape mulch; and export (USEPA 2010). These applications are discussed in the following sections.

### **Athletic/Recreational Surfaces**

Athletic and recreational field applications have emerged as one of the largest and most rapidly growing markets for ground rubber in the U.S. This market segment encompasses the use of ground rubber in synthetic sports turf, natural grass turf, playground cushioning, and playground turf. The Synthetic Turf Council and other industry sources estimate that ground rubber-based sport surfacing has grown to more than 1,000 field installations in the U.S. as of 2012.

This market segment also encompasses ground rubber used as a loose fill (bark and mulch) cushioning under and around play equipment. Ground rubber is also incorporated in pour-in-place protective surfaces and is the main ingredient in molded rubber playground mats and tiles installed in play areas for fall protection and ADA accessibility. Industry reports indicate that there was a slight decrease in ground rubber use in this market in 2011. This estimation is mostly drawn from a few states that report ground rubber use as part of grant program project awards and anecdotally from industry stakeholders. However, no published data on a national scale provide specific quantities of ground rubber used annually for playground installations.

### **Molded and Extruded Products**

Molded and extruded products are one of the oldest uses for ground tire rubber. Molded products have been made from tire buffings for many years but ground tire rubber has replaced tire buffings in many products as the volume and quality of ground rubber produced in the U.S. grew and the range of products and the size of the market expanded. For molded products, ground tire rubber, typically 10 to

30 mesh, is combined with urethane and other additives including plastics, depending on the application.

Molded rubber products are found in diverse applications across many commercial and industrial markets. These markets include but are not limited to flooring, mats, carpet underlay, wheelchair accessibility ramps, roof walkway pads, garden pavers and tiles, wheel stops, traffic control devices, and more. According to the RMA's latest waste tire market data, molded and extruded products are the second largest application for ground rubber from waste tires. These products represented about 32 percent of ground rubber usage in the U. S. in 2011.

A new growth area in the molded and extruded products market is in the use of ground rubber with other rubber or plastic polymers to enhance or modify thermoplastic properties. This application opens up opportunities for using ground rubber in injection molded products and extruded goods. Continuing research and development of products using surface modified and surface treated rubber is expected to further build market potential in this sector.

### **Tires and Automotive**

Ground rubber from waste tires is used in manufacturing new tires, in rubber compounds used to retread worn tires, and in molded and extruded automobile parts. Tire manufacturers report that limited quantities of finely ground waste tire rubber (5 to 15 percent by rubber weight) can be used in some components of the tires. Development of new rubber compounds using tire-derived ground rubber is creating new market opportunities for ground rubber in off the road (OTR) tread rubber compounds and in solid rubber tire retread rubber. Use of ground rubber in automotive and vehicle parts and accessories was up in 2011 and continues today as vehicle manufacturers promote sustainability, environmental responsibility, and use of recycled materials in their products.

### **Landscape Mulch**

Landscape mulch rubber, generally the same material used in loose-fill playground surfacing, is sold to landscape designers and installers, architects, building managers, contractors, and others for use in a wide variety of landscaping and mulch applications. Growth in this market has taken ground rubber directly to consumers through sales in national big box retail outlets such as Home Depot, Costco, Walmart, Lowe's, and others. As a result, a national market and national marketplace presence for ground tire rubber is developing.

### **Rubber Modified Asphalt**

Rubber modified asphalt is a pavement mix that blends ground tire rubber with asphalt to modify the properties of the asphalt in highway construction. Ground tire rubber can be incorporated either as an asphalt binder or as an aggregate. Rubber modified asphalt technology was first introduced more than 30 years ago and has been actively promoted over the past 20 years. Rubber modified asphalt is the third-largest application for ground rubber in the United States, accounting for 11 percent of the ground rubber market in 2011. Until recently, more than 90 percent of the rubber modified asphalt produced

has been used in Arizona, California, Florida, South Carolina, and Texas. Many other states, including Nevada, Rhode Island, Washington, Missouri, and New Jersey, have conducted trials and paved test sections of roadway with rubberized asphalt but overall the market for ground rubber in asphalt applications has not expanded significantly.

#### 4.2 Summary of Expansion Opportunities for Beneficial End Uses of Waste Tires in Colorado

Considering the information presented above, the main opportunities for expanding the end use capacity for waste tires in Colorado are:

- Increase consumption of existing cement plants, including using waste tires in heretofore unused places in kilns.
- Bring additional cement plants on line (CEMEX in Lyons and GCC in Pueblo).
- Establish consumption at EVRAZ Steel Mill.
- Increase design applications for TDA in highway and landfill applications.
- Monitor efforts to develop new pyrolysis technologies capable of achieving technical and economic success that has been so elusive historically.
- Begin using crumb rubber in asphalt.
- Increase other ground rubber markets.

#### 4.3 Investment Strategies

In a well-functioning market for private goods, suppliers provide goods and services to consumers at a price that meets the needs of both supplier and consumer. Government intervention in the marketplace can be used when a negative externality exists that needs to be addressed—in this case, stockpiling waste tires. Intervention can be in the form of regulation, but it can also be financial in nature, such as a tax, tax credit, fee, or subsidy to stimulate a desired market.

With that in mind, this section discusses how government activities and funds channeled through the Waste Tire Market Development Fund may be most effective as a complement to the private sector to stimulate both the demand side and the supply side of the waste tire market. This section also outlines public- and private-sector government partnerships opportunities that may serve the overall goal of market development. Finally, this section includes commercial financing options for waste tire enterprises and presents a table that summarizes investment options.

##### **Demand Generation**

Sufficient demand is necessary to stimulate development and expansion of private-sector enterprises for retrieving, hauling, and processing waste tires. A key determinant of the ability for newly developed and established enterprises to qualify for commercial financing will be the anticipated product demand, both in terms of reliability of demand and volume demanded. Demand reliability is important for demonstrating a predictable revenue stream over time to potential lenders for private-sector companies seeking finance. The overall volume demanded is especially important for profitability when a large initial capital investment is required. As a portion of the fixed cost of equipment must be recovered

from each unit's selling price, and the more units sold, the greater the possibilities to recover initial capital investment costs and remain profitable.

A valuable role for Waste Tire Market Development Fund (WTMDF) would be to fund a marketing campaign to generate demand in the marketplace for Colorado-produced waste tire material, secondary products made from shredded tires, and waste tires to be used directly as fuel. Demand can be from private-sector companies or public-sector agencies, as discussed below.

*Private Sector Demand:* As is already planned, display and demonstration projects can be effective in promoting the use of waste tire material and waste tires by industry, particularly if coordinated with industry associations.

The WTMDF may consider offering incentives to companies to use these materials, but it would need to consider the cost and complexities of establishing such a program, particularly if there are a large number of buyers. The WTMDF may further consider whether market momentum would be maintained after phase-out of the program.

*Public Sector Demand:* Government entities, such as the Department of Transportation, public works departments, or recreation departments, can influence the use of tire-derived products through procurement rules and procedures. Departments can purchase waste tire materials through their department budgets, as they would with any other purchase of materials. As interest in the use of waste tire materials develops among government agencies, they may face the issue that it costs more than alternative materials. The CDPHE may want to consider funding a state or municipal grant program to make it financially feasible for agencies to incorporate waste tire materials into demonstration projects within their budget constraints. This support can help to generate a large volume of demand by stimulating public-sector purchases. In some cases, blanket negotiated purchase agreements have been developed to facilitate purchases by multiple agencies. It would be important to have well-defined criteria for grant qualification and awards.

### **Supply Generation**

Supply-side enterprises include companies to retrieve, haul, and process waste tires, assuming that companies interested in using waste tires as fuel already exist and would just be making the decision to purchase raw tires or processed tires as a fuel source. The private sector will be motivated to meet any unfulfilled demand in the marketplace, as long as it is profitable to do so. If a sufficient and reliable demand is created, it will serve as the impetus to initiate or expand businesses, and those that are well managed will survive. Past experience with waste tire product companies in the U.S. has shown that generating supply without sufficient demand or an adequate understanding of the market dynamics can lead to business failures.

## **Waste Tire Market Development Fund**

There are two ways that government finance channeled through the WTMDf may be applied to help develop the waste tire market. One would be to stimulate the demand for TDF and waste tire materials, and the other would be to assist in business development to grow their supply.

To stimulate demand, the WTMDf could issue grants for select activities, such as marketing and training programs or technical and financial feasibility studies regarding use of TDF and waste tire material. As discussed above, grants could be provided to public-sector agencies to help them incorporate waste tire material into their projects. In addition, and as mentioned above, purchase incentives could be provided by buyers, but there is a concern of maintaining a robust market after phase-out of the incentive.

Grants issued to suppliers would potentially introduce distortions to established market by creating an unfair competitive advantage for some suppliers over others who may have already purchased equipment with private funding. The same would be true for tax incentives for equipment purchases. This type of concessionary finance may be best-suited for the demand-generation activities noted above.

The State of California operates a tire grant program through CalRecycle to support activities that help reduce the volume of waste tires. Activities supported include cleanup of tire waste piles, enforcement activities, market development, and demonstration projects. These grants are funded by fees charged for new tires sold in California. Previously, they have funded research, business assistance, product procurement, and amnesty events. The grants are issued to individuals, businesses, local governments, universities, school districts, park districts, and qualified California Indian tribes.

Another type of concessionary finance is soft loans (issued with less stringent terms than commercial finance) for equipment purchases and other capital investments for new and expanding businesses serving the waste tire market. With scheduled payback over time, the WTMDf could operate as a revolving fund that continuously issues new loans as funds are repaid by borrowers. While the advantageous lending terms introduces some distortion to the market, it is much less than with grants. The loans would boost businesses that may otherwise have a difficult time qualifying for loans on the commercial market because of relatively unknown technologies or an undeveloped market sector. This type of loan program would require well-defined application qualification and screening procedures, award criteria, and repayment terms.

## **Public-Sector Partnerships**

Public-sector partnerships include public-public partnerships (PuPs) between two government entities and partnerships between a government organization and a non-profit organization, where neither partner is seeking to gain a profit, but to better serve the public good.

This type of arrangement is frequently seen in the water sector among utilities, where more established utilities help to develop the capacity and effectiveness of partner utilities. However, PuPs are flexible

and can be adapted to many situations where there are compatible expertise and a shared vision among two partners to reach a socially desirable goal. There may be modest administrative costs associated with partnership activities, which would potentially come from the WTMD. It is important to have the following in place when a PuP is developed:

- Shared vision of goals, timeline, and what constitutes effective outcomes
- Memorandum of Understanding or other type of agreement that details each partner's responsibilities and funding commitments
- Common understanding of the ongoing coordination and decision making processes that would be needed to adapt to changing situations
- Clear understanding of the mutual reporting requirements among the partners
- Agreement on which partners may claim credit for program successes for internal organizational and promotional purposes

Some potential partnerships that the CDPHE might consider are:

- Industry Associations: to develop display and demonstration projects, disseminate information on technical and financial feasibility, and to survey members on potential interest in TDF and waste tires material.
- University of Colorado Denver Bard Center for Entrepreneurship: to work with students, faculty, and entrepreneurs to promote potential business opportunities in tire recycling
- State and Local Government Agencies: to implement training programs on use of waste tire material for road projects, civil engineering projects, playground and athletic fields, and other.

### **Public-Private Partnerships**

A public-private partnership is a contractual agreement between a public entity and a private-sector organization, whereby the private-sector partner produces the good or service, with the public-sector retaining large responsibility for the objectives and oversight of the activity. Public-private partnerships can take the form of contracting out, franchising, joint ventures, and strategic partnering.

Public-private partnerships are commonly used when government has assumed responsibility for the provision of a public good or service because an inadequate supply is provided by the market or it is distributed unequally among the population, because of pricing and other reasons. However, the government may not be well suited to efficiently produce the good or service as a result of a variety of considerations that include technological expertise, capital investment requirements, and economies of scale.

By taking advantage of the skills and assets of each partner, a project can be developed to benefit the public in greater terms than if undertaken by one of these partners alone. Each partner contributes in an agreed-on way and shares in the potential risks and rewards. The private-sector partner will be seeking to gain a profit from the partnership, so this type of arrangement is best suited for activities that can be expected to generate relatively predictable income over time to the private-sector partner.

When used for utility operation, there is usually a predictable revenue stream from user fees or other similar payments.

CDPHE should consider whether any of the demand-side or supply-side waste tire market needs are most effectively met by a public-private partnership. Examples would be contracting to marketing for in-state and out-of-state demand generation and training of government entities on uses for waste tire materials in government projects.

### **Commercial Financing**

Loans and lines of credit from a commercial lending institution, issued at a commercial lending rate, would be best suited to well-established enterprises that are expanding their operations to include tire recycling. These enterprises would have established relationships with creditors and proven management capacity that would help to qualify for this type of financing—for example, a successful general hauling company that is purchasing appropriate retrieval equipment or additional trucks to expand into tire hauling, or a recycling facility that purchases equipment and expanded storage facilities to shred waste tires for resale to the secondary market. In the case of the haulers, they would need to demonstrate the anticipated revenue stream from tipping fees and possible purchase fees paid by the tire processor. For the recycling facilities, they would need to demonstrate anticipated revenue from waste tire material sales.

For facilities that would use waste tires as a fuel product, presumably they are doing so because of cost savings over alternative fuels. Should they incur additional up-front costs in equipment needed to adapt to the new fuel, a well-established business would be in a position to qualify for commercial financing, particularly by demonstrating the operating cost savings over time by using this fuel over more expensive alternative fuels. Table 9 presents a summary of potential enterprise capital funding needs, financing options, and risk factors, among other considerations.

**Table 9: Summary of Investment Options**

<b>Activity</b>	<b>Potential Market for Product/Service</b>	<b>Major Investment Requirements</b>	<b>Financing Options</b>	<b>Revenue Source</b>	<b>Key Risk Factors for Profitability</b>
<b>Tire retrieving and hauling</b>	Fairly developed	<ul style="list-style-type: none"> <li>- Retrieval equipment</li> <li>- Trucks</li> <li>- Worker training</li> </ul>	Commercial finance for established enterprises	<ul style="list-style-type: none"> <li>- Tipping fees</li> <li>- Possible purchase fees from processing facility</li> </ul>	Reliable stream of waste tires
<b>Tire processing and delivery for secondary product or fuel use</b>	Somewhat developed	<ul style="list-style-type: none"> <li>- Storage facility</li> <li>- Processing equipment</li> <li>- Worker training</li> <li>- Trucks</li> </ul>	Commercial finance for established enterprises	Sales of processed tire material	<ul style="list-style-type: none"> <li>- Reliable stream of waste tires</li> <li>- Sufficient demand</li> <li>- Changes in fuel costs</li> </ul>
<b>Pyrolysis plant</b>	Variable	<ul style="list-style-type: none"> <li>- Processing equipment</li> <li>- Storage facility</li> <li>- Safety equipment</li> <li>- Work training</li> </ul>	Commercial finance difficult because of the history of failures among pyrolysis plants	<ul style="list-style-type: none"> <li>- Tipping fees</li> <li>- Sale of primary and secondary value-added products</li> </ul>	<ul style="list-style-type: none"> <li>- Operating problems</li> <li>- Fluctuating market prices</li> <li>- Uncertain product demand</li> <li>- Changes in fuels costs</li> <li>- Changes in environmental disposal fees</li> <li>- General economic fluctuations (impacting labor and general operating costs)</li> </ul>
<b>Molded Products</b>	<ul style="list-style-type: none"> <li>- Second largest application for ground rubber</li> <li>- Versatile, variety of products</li> </ul>	<ul style="list-style-type: none"> <li>- Processing equipment</li> <li>- Product testing (for new products)</li> <li>- Distribution and marketing</li> </ul>	Start-up finance Assistance from WTMDP	New product sales	<ul style="list-style-type: none"> <li>- Changes in market demand for certain products</li> <li>- General economic fluctuations (impacting labor and general operating costs)</li> </ul>

Activity	Potential Market for Product/Service	Major Investment Requirements	Financing Options	Revenue Source	Key Risk Factors for Profitability
Playgrounds/Athletic Field Construction	Large market and rapidly growing	- Equipment (minimal) - Work training	Start-up finance Assistance from WT MDF	New product sales	- Changes in market demand - General economic fluctuations (impacting labor and general operating costs)
<b>Existing businesses incorporating waste tire materials into existing projects or as fuel</b>					
Landscaping Use Road Paving Civil Engineering Projects Electric Power Plants Cement Plants Steel Plants	NA	Adaptation to new raw material or fuel	- Existing lines of commercial credit or internal funds - WT MDF assistance, especially for public sector entities	Existing product sales	Problems adapting to new raw material or fuel resulting in unanticipated costs

## 5.0 Market Development Plan

This section builds off of the previous sections of this report to outline the recommended plan for developing and engaging waste tire reuse and recycling capacity necessary to consume 100 percent of newly generated and stockpiled waste tires in the state. For this plan, the date for achieving this goal is December 31, 2024; the number of tires in monofill storage and legal stockpiles is estimated to be 61.2 million; and there are an unknown quantity in illegal stockpiles and dumps within the state. The number of waste tires annually generated is estimated to be an average of 6 million tires per year, reflecting growth in Colorado's population and economy. This section presents a conceptual model of the sources, processors, end uses, transport pathways, and tire flow volumes that are relevant to achieving this goal. This section also presents a Gantt chart that shows the chronology of the main steps recommended to achieve this goal and a monitoring plan that assesses and promotes the effectiveness of the recommended steps.

### 5.1 Conceptual Model of the Goal State

Whereas Figure 1, introduced in Section 2, diagrams the waste tire flow system in Colorado based on 2011 information, Figure 5 represents the state's waste tire flow system based on the updated information presented in this plan. This figure also presents the end use alternatives that are judged most likely to succeed in achieving the goal of 100 percent recycling or beneficial use of the state's stored and monofill storage and annually generated waste tires. The white arrows on Figure 5 represent the "goal state" -- the average annual waste tire flows and consumption rates that will need to be maintained in the system over a 10-year period to achieve 100 percent beneficial consumption by 2024.

It is important to understand that this system is highly dynamic: during early years, end use capacity will likely be building up, while during middle years, end use consumption will likely be at its highest, and during the later years, end use consumption rates will taper down as the monofill waste tires are depleted.

Furthermore, as efforts to build end use capacity progress, it may turn out that some end uses expand more rapidly than others, so the flow and consumption rates shown on Figure 5 could alter significantly. Nevertheless, Figure 5 reflects the end uses that are believed to be most capable of success, and hence, are worthy of pursuit at this point. Figure 5 also illustrates relative flow and consumption rates that are reasonable for these alternatives.

In comparison to the 2011 waste tire flow system, the goal state system exhibits the following similarities and differences; significant assumptions are also listed:

- 1) Annual generation increases to 6.5 million waste tires per year, reflecting the updated values presented earlier in this plan.
- 2) Grading flows remain the same as in 2011.
- 3) Illegal transportation and dumping are assumed to have essentially ceased (the flow arrows for these are no longer represented on the figure) as a result of increased enforcement, tracking, and more strategic financial incentives.

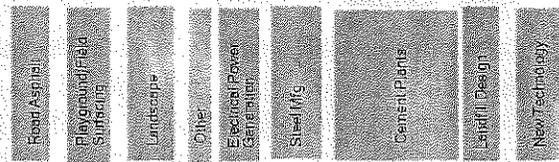
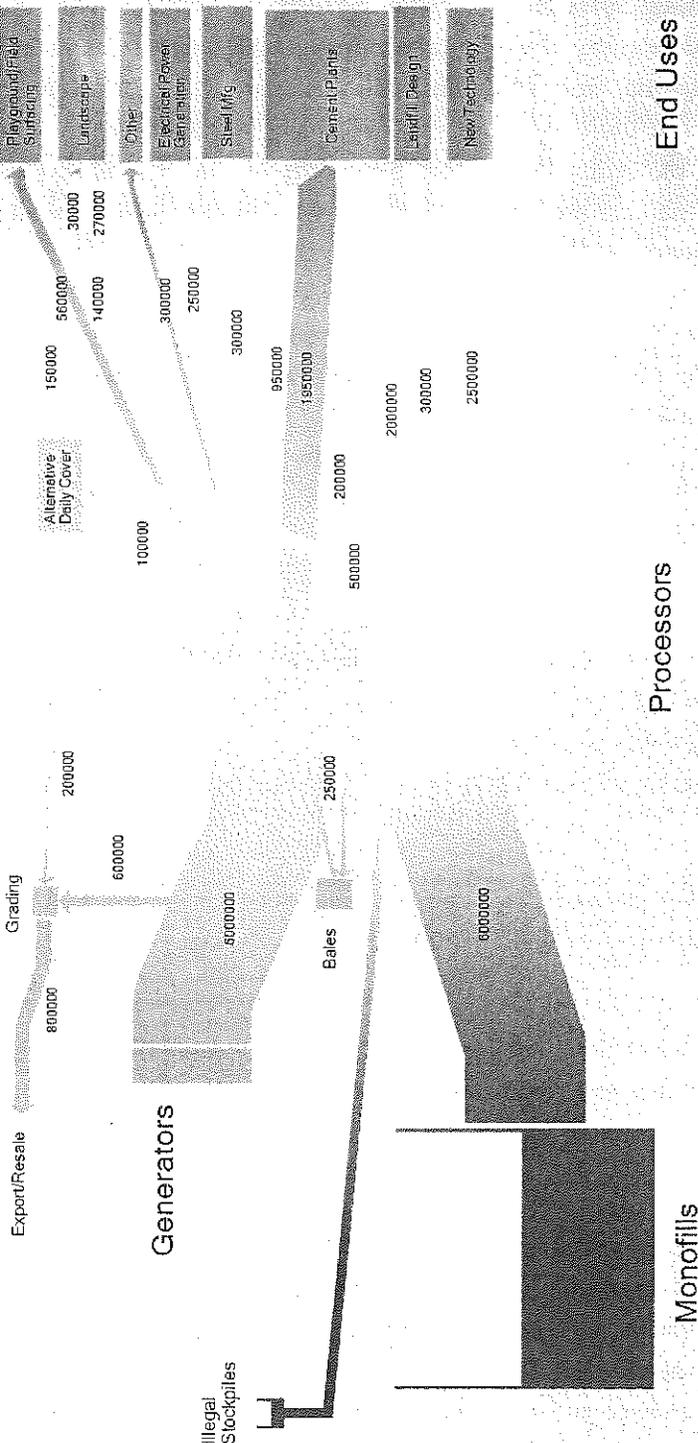


Figure 4  
Goal State for  
Average Annualized  
Waste Tire Flow  
System



- 4) Monofills and illegal dumps are being depleted of their waste tires. At the end of the 10-year period, the monofills should be completely depleted.
- 5) The additional waste tire flows that are needed (white arrows), and the flows already being realized (colored arrows) are shown via arrow widths and directions. The larger of the additional waste tire flows are also shown numerically.
- 6) Alternative Daily Cover and Baling decrease to minimal usage for specific needs where tire-derived products are uniquely suitable and monitored.
- 7) Additional annual flow rates of waste tires from monofills equates to 6 million tires per year (average), plus a quantity from illegal stockpiles estimated to be 500,000 tires per year. Note that current owners of the two largest monofills have indicated that they will increase market capacity to a level that could consume the majority of the monofill tires. Based on current information, these markets are included within energy market development that will be driven by the monofill owners. If these plans fail to be implemented, the State would then need to choose whether to accelerate its market development plans to utilize as many monofilled tires as possible, or to close the sites using financial resources from the owners. Nevertheless, this figure presents other beneficial use markets that may be extended if current monofill owners are unsuccessful in fulfilling current intentions.
- 8) Additional processing is developed in order to handle the additional flow from the monofills.
- 9) Additional end use capacity is developed for the existing end uses of playground/field surfacing, landscaping, TDA, and cement plants.
- 10) Pyrolysis, or an alternative technology at the Hudson Tireville (CH2E) is effective and depletes the Hudson monofill of 2.5 million waste tires per year over the entire 10-year period.
- 11) CDOT begins to use crumb rubber in road asphalt and increases in other ground rubber markets consume 200,000 waste tires per year; the ability to generate this much crumb rubber is developed through increased processing capacity.
- 12) The steel plant builds an average waste tire consumption capacity of 300,000 tires per year.

## 5.2 Action Sequence

Figure 6 is a Gantt Chart that presents the schedule (sequence) of actions that need to be taken to engage the opportunities identified in Section 4.0 so that the goal state represented on Figure 5 can be realized.

The steps presented on the Gantt chart are necessary to connect the organizations, people, information, and funding needed to capitalize the opportunities presented in this Waste Tire Market Development Plan.

## 5.3 Monitoring Plan

This Waste Tire Market Development Plan lays out steps leading to the beneficial use of all waste tires produced and stored in the State of Colorado. Some of these steps can lead to new technologies; others to expanded end uses with existing entities. Many of these steps need to be advanced iteratively while monitoring the resulting change in beneficial use capacity. Some steps may lead to more beneficial use than predicted, other steps may consume less than intended. As the program advances through these

steps, it will be important to regularly monitor the results that are being gained, the overall status of the system, existing and perhaps new influences, and then to adjust activities accordingly to garner the most valuable increases in beneficial use for the state and its citizens. Waste tire market development is a marathon, not a sprint, and requires a thoughtful plan, experience and perseverance.

To this end, a Monitoring Plan should be implemented that involves a combination of quarterly status reports delivered to the Waste Tire Committee, and collaborative meetings with the Waste Tire Committee to discuss these reports and refine next steps. The quarterly report should center on these three components of this Marketing Plan:

- 1) Gantt chart. The Gantt chart should be updated and presented to the Waste Tire Advisory Committee on a quarterly basis, with percent complete represented for each task, and a discussion of progress made, factors concerning task success, hurdles, recommended course corrections, and lessons learned.
- 2) Goal State Figure (Figure 5 in this plan). This figure should be updated periodically using currently available information and then used to monitor the status of monofills (how many tires remain), processors (how many tires are being processed), end users (how many tires are being beneficially used), flow paths, and haulers, and to maintain a flow balance that does not allow tires to be untracked within the system. The updated goal state figures can be compared with the earlier versions, including Figure 5 in this plan, to assess the actual performance being obtained by the market development efforts.
- 3) The Distribution of Current Colorado Waste Tire generators, Monofills, Processors, and Existing Major end users (Figure 2 in this plan) should be updated periodically and used to track the location and status of illegal dumps, progress of remediation, and other project elements including contractor activity and progress. Opportunities for local beneficial consumption of illegally dumped waste tires could also be evaluated from this figure.

Based on review of these elements of the Monitoring Plan, the Waste Tire Advisory Committee can identify steering actions designed to best advance the progress of the Waste Tire Market Development for the subsequent quarter. These actions will address the previous results and circumstances, and new developments, to best advance Colorado's waste tire system toward the beneficial use of all of the state's stored and annually generated waste tires.

Colorado Waste Tire Market Development Plan  
Schedule  
CDPH&E and Waste Tire Advisory Committee

Task Number	Task Name	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
1	QUARTERLY MONITORING REPORTS AND MEETINGS														
2	REGULATORY DEVELOPMENT														
3	MODIFICATIONS														
4	Identification of Conceptual Alternatives														
5	Conceptual Agreement														
6	Legislative and Regulatory Development														
7	Legislative Introduction														
8	Legislative Support														
9	STOCKPILE PROGRAM														
10	CDPHE Takes Direct Control of Cleanups														
11	Develop Map Site List														
12	Examine Sites/Pileup Summaries														
13	Prioritize Sites														
14	Develop Contractor RFP														
15	Develop Site Bid Document														
16	MARKET DEVELOPMENT														
17	CIVIL ENGINEERING														
18	CDOT APPLICATIONS														
19	Develop Educational Seminar Plans														
20	Implement Seminars														
21	Initiate Project Identification														
22	Assist Project Design														
23	Assist Project Implementation														
24	LANDFILL APPLICATIONS														
25	Develop Educational Seminar Plans														
26	Implement Seminars														
27	Initiate Project Identification														
28	Assist Project Design														
29	Assist Project Implementation														
30	ENERGY/FEEDSTOCK UTILIZATION														
31	Assist Cement Company Evaluations														
32	Assist Cement Plants as Vantaged														
33	Assess Biomass Facilities/Plans														
34	Assist Steel Mill Evaluations														
35	Support Renewable Energy Designation as Vantaged														
36	GROUNDED RUBBER														
37	Assess Processing Capabilities and Needs														
38	Identify End Users by Category														
39	Explore Educational Seminars/Meetings/Needs														
40	Develop Educational Seminar/Plans for RMA														
41	Implement RMA Seminars														
42	Identify Specific Market Accelerators														
43	Implement Feasible Accelerators														
44	Identify Public Information Needs and Vehicles														
45	Identify Targeted Markets for Retail Demonstration Centers														



TETRA TECH

## 6.0 References

Amme, Dr. Robert. 2008. "Promoting Rubberized Asphalt and Other Scrap Tire Products in Colorado" University of Denver.

California Waste Tire Market Report. 2011. CalRecycle, June 2012.  
<http://www.calrecycle.ca.gov/Tires/Grants/> - accessed April 9, 2013 (CalRecycle website)

Colorado Department of Public Health and Environment (CDPHE). 2012. Status of Waste Tire Recycling in Colorado, 2011 Annual Report to the Transportation Legislation review Committee. June 27.

Humphrey, Dr. Dana, "Civil Engineering Applications of Chipped Tires", 2010

Marek A. Wojtowicz and Michael A. Serio . 1996. "Pyrolysis of Scrap Tires: Can it be Profitable?" Chemtech. October

Recycling Research Institute, internal industry research, 2012-13.

Rubber Manufacturers Association. "2011 U.S. Scrap Tire Markets". PowerPoint presentation dated February 11, 2013

Scrap Tire News (STN). 2013. The Scrap Tire & Rubber 2012 Users Directory, Recycling Research Institute. Vol. 26, No.3.E, 2011.

Tire Retread Information Bureau (TRIB). 2013. Tire Retread Information Bureau, personal communication.

USEPA 2012. USEPA Tire-Derived Fuel Webpage. [www.epa.gov/osw/conserves/materials/tires/tdf.htm](http://www.epa.gov/osw/conserves/materials/tires/tdf.htm)

USEPA 2010, "Scrap Tires: Handbook on Recycling Applications and Management for the U.S and Mexico", United States Environmental Protection Agency, EPA530-R-10-010.



COLORADO TRANSPORTATION LEGISLATIVE REVIEW  
COMMITTEE

PRESENTATION: SUMMER 2013

## What is WSTA

WSTA States Involved Currently, 10 states – Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, Utah and Wyoming – participate in the agreement. States are represented at WSTA meetings by state legislators, state agency personnel, and highway transportation industry representatives.

- WSTA Started in 1988
- Colorado Joined in 1989



## WSTA Policy Goals

---

1. Funding for Highway Infrastructure
2. Highway Safety
3. Increase System Productivity and Efficiency
4. Achieve uniformity for western states
5. Embrace new technology



## Highway Safety

---

1. Promote new technology to regulate and control traffic on system
2. Support on-going safety programs that prove to perform and achieve safety benefits.
3. Encourage user participation in safety program development, regulatory revisions and any technical enhancements.



## Highway Funding

---

Seek solutions that will provide funding:

1. Solutions are cost effective and secure
2. Ideas can be out of box- utilizing new formats/technology
3. Promotes economic development for stake holders
4. Are sustainable an grow in productive fashion.



## Increase Productivity/Efficiency

---

1. Seek ways to merge new technology with statutory or policy guidelines
2. Embrace that geographical differences mean opportunities for Western States that do not exist in other parts of the country.
3. Move critical decision making on system regulation to states.
4. Ensure that proper safe guards exist to maximize potential benefits
5. Look for flexibility in new federal reauthorization legislation.



## Western State Uniformity

---

1. Uniformity brings greater productivity for transportation industry and for state oversight and enforcement.
2. Uniformity allows western states to compete in both national and global markets.
3. Allows for lower costs to consumers in the market place- majority served by highway freight delivery.



## Embrace New Technology

---

1. Weigh stations and ports of entry operations can be revamped to dramatically improve size and weight enforcement-reasonable cost.
2. Design and technology of motor vehicles provides us both benefits and challenges- we must be willing to step up to meet these issues.
3. Realize that emissions reductions, environmental goals and greater public benefit do not have to be in opposition to productive and efficient movement of goods and people.





---

**CONTACT INFORMATION**

RJ HICKS – EXECUTIVE DIRECTOR

[WWW.WSTASTATES.COM](http://WWW.WSTASTATES.COM)

Good stuff.



## State of the Colorado Trucking Industry for 2013

April, 2013



Good stuff.



## Good Stuff - Trucks Bring It



*If you wear it  
or you dribble it  
or you play it  
trucks bring it*

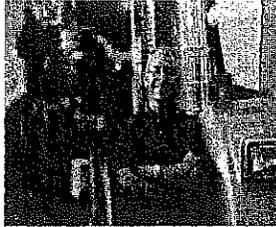
*From diapers to satellite dishes, virtually everything we own, everything we eat, everything we wear, every material that goes into building our homes and offices – all of it comes to us thanks to trucks and truck drivers. Last year, trucks transported more than 7.7 billion tons of freight.*



Good stuff.



## Economic Impact of Trucking in Colorado



- Trucking employed almost 92,000 people in 2011
- 1 out of 20 workers work in trucking related businesses
- Trucking pays almost \$4.3 billion in wages
- There are 9,240 trucking companies located in Colorado, most of them small, locally owned businesses. (most have less than 10 employees)



**CACA**  
COLORADO AGENCY CAREERS ASSOCIATION

Good stuff.



## Trucking and Warehousing Good Jobs for Colorado Residents and Good Business for Colorado

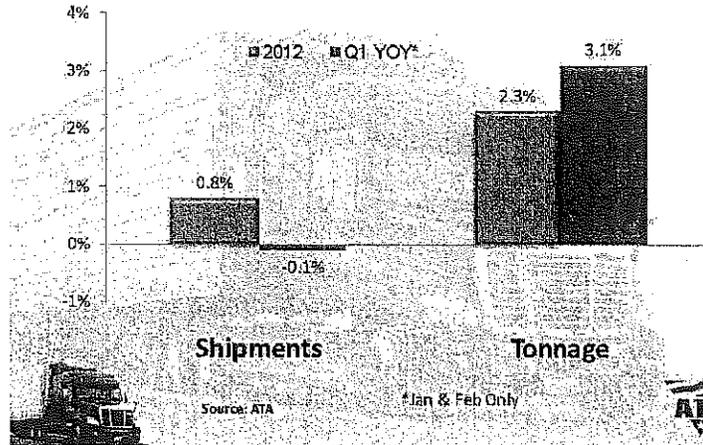
- Avg. salary for trucking jobs in Colorado was \$47,228 in 2012. This is significantly higher than the state average.
- Wages are rising due to a shortage of qualified drivers, drivers earn wages of \$50,000 to \$100,000 annually also most trucking companies provide good benefits for their employees including health insurance, disability, and retirement options
- Trucking Companies generate substantial tax revenues \$\$\$ for local communities and state - not only directly but through their purchases from companies that support them
- Trucking companies can significantly benefit economically disadvantaged areas -- (Many small towns in Utah, Neb., and Kan. are home to some of the largest trucking companies
- Trucking is a base industry that helps to mitigate economic swings
- Creates opportunities for students and others to remain in the community and have a position in a stable and growing industry career young people in the county
- Unlike some industries, trucking can't be moved off-shore or out of the country

**CACA**  
COLORADO AGENCY CAREERS ASSOCIATION

Good stuff.



## Changes in Freight Volumes (Seasonally Adjusted)



Source: ATA

\*Jan & Feb Only



Good stuff.



## Truck Safety Good and Getting Better

- 2010 was the best year in recorded history regarding the truck fatality rate with an average of 1.2 in recorded history. This is a 75% decrease from 4.9 in 1975, the first year the USDOT began keeping records.
- Since 1982, alcohol involvement for large truck drivers in fatal crashes has declined by 85 percent.
- A recent study by Virginia Tech conducted for the USDOT found that 78% of crashes involving trucks were caused by passenger car drivers.

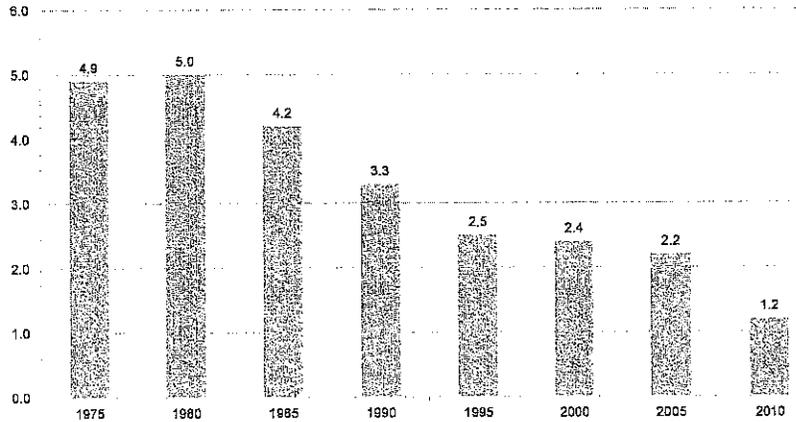


Good stuff.



## Large Truck Crash Rate (per 100 million VMT)

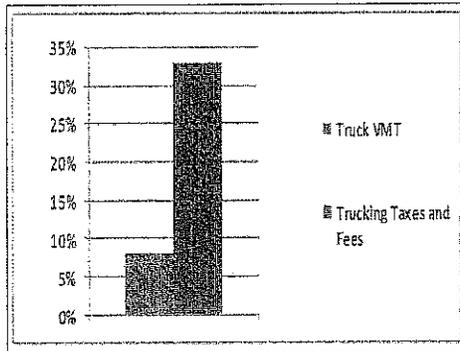
1975-2010



Good stuff.



## Trucking and the Highway User Tax Fund



- Trucking industry paid \$443 million or 33% of Colorado's federal and state roadway taxes and fees in 2009

- Trucking only represents 8% of vehicle miles traveled in Colorado.

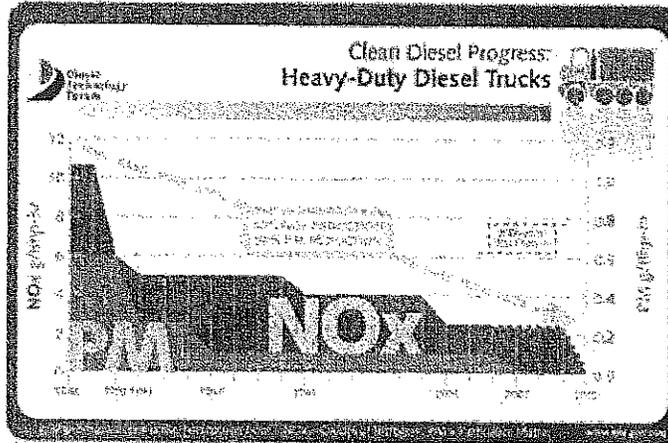


Good stuff.

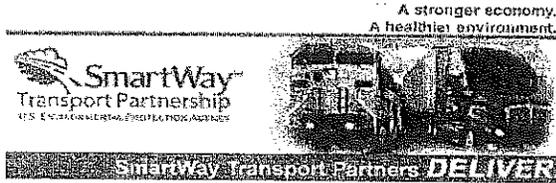


# Trucking and the Environment

## An Impressive Record of Improvement



Good stuff.



SmartWay encourages carriers and shippers to adopt or implement actions to make ground freight more efficient and cleaner for the environment.

Reduction  
Low-Viscosity  
Lubricants

### Some Participants in Adams County

Houg Spec Svcs.	Waste Mgmt.
Fed Ex	Westco
American Furniture	CAST
HVH	UPS
American Armor	Wal-Mart
Denney Transport	Direct Transport
Domenico Transport.	Navajo



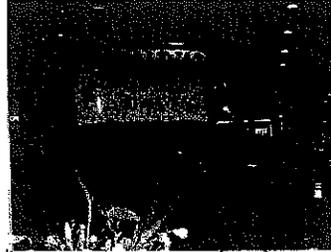
Good stuff.



## SmartWay Tractors and Trailers

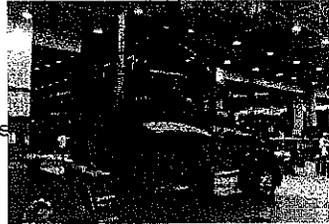
### SmartWay Tractors:

- Model Year 2010 or later engine
- Integrated cab-high roof fairing
- Tractor-mounted side fairing gap reducers
- Tractor fuel-tank side fairings
- No idling
- Low-rolling resistance tires (single wide or dual)



### SmartWay Trailers:

- Side skirts;
- Weight-saving technologies;
- Gap reducer on the front or trailer tails (extenders)
- Low-rolling resistance tires (single wide or dual)



Good stuff.



**2013 EPA SmartWay Affiliate Honoree  
Colorado Motor Carriers Association  
(one of only 7 within the country)**



Good stuff.



## Key Concerns

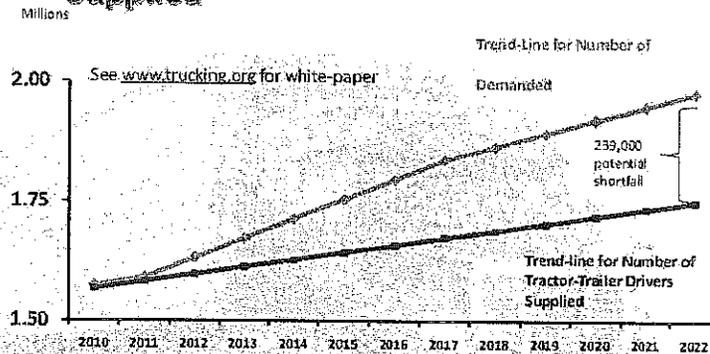
- Hours of Service Changes (dictates allowable driving hours and rest periods) – new rules will reduce truck productivity by 1.5% to 4% - need for more drivers
- Driver and Mechanic Shortage
- Independent Contractor Issue
- Affordable Care Act and Impact on Health Insurance Rates and Requirements
- Oilfield Hours of Service Exemption



Good stuff.



## Tractor-Trailer Drivers Demanded and Supplied



Source: ATA



Good stuff.



## I-70 CORRIDOR CHALLENGES AND OPPORTUNITIES



Good stuff.



## Challenges, Limitations, and Constraints for Trucking on I-70

- Hours of Service - # of Driving Hours Allowed
- Lack of Truck Parking along I-70 from Denver to Grand Junction
- Community restrictions – limits when deliveries can be made, size of vehicle etc.
- Businesses in Colorado mountain communities have very limited storage –due to real estate costs requiring in many cases daily deliveries and more during peak
- Customer demands/needs determine the schedules for trucking companies
- No real alternate corridor for east-west travel in the state - other routes take much longer and involve many more miles
- I-70 is one of only two east-west interstate corridors in the country and serves not only Colorado but the nation
- Communication challenge of reaching several million drivers and several hundred thousand fleets



Good stuff.



## Peak Period Travel on I-70 and Trucks

- Fleets actively seek to avoid peak periods – trucks only make up 1.6% of eastbound traffic during Sunday peak in ski season and 2.3% of peak traffic in summer.
- Most trucks in the corridor at that time are serving businesses in Colorado, in fact many are traveling to locations in the mountains – 85% are Intrastate
- A large amount of the shipments during that time involve essential products such as food and fuel which relate directly to demand (more people in the mountains, more food and fuel needed). Other shipments in this window may involve mail or parcel delivery based on required delivery times. Also time sensitive deliveries such as medical supplies and some forms of other items.



Good stuff.



## CMCA Action List for I-70

- Education and Information
- Strategies to Improve Traction
- Specific training focused on I-70 Corridor and chain procedures
- Realignment of Operations
- Equipment Changes
- Continue the partnership among the industry, CSP, CMCA, CDOT, and local communities

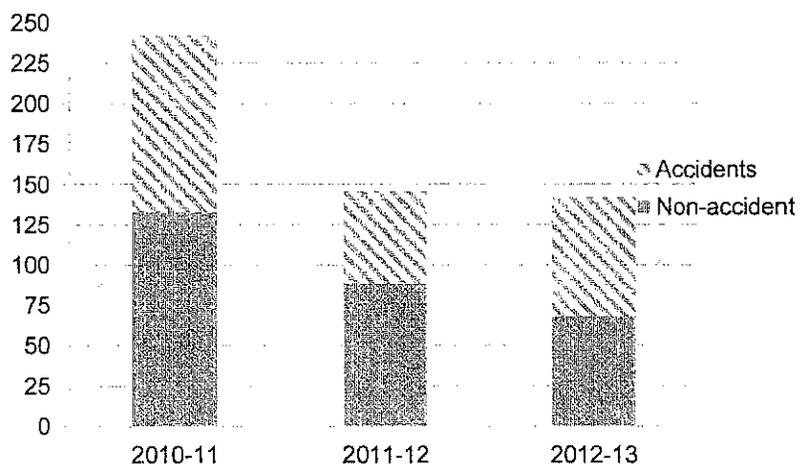
### Bottom Line for Action Items

- ❖ Improve Safety and Mobility on the I-70 Corridor
- ❖ Reduce Impacts of Trucking during Peak Periods





## Hours of Lane Closure I-70 – Denver to Vail Due to Commercial Vehicles



## Truck Traffic on I-70 during Peak Periods

	December – March		July – August	
	Winter 2011/12	Winter 2012/13	Summer 2011	Summer 2012
Average Hourly Total Volume <sup>2</sup>	2544	N/A	2894	2538
Average Hourly Heavy Vehicles Volume <sup>2</sup>	41	N/A	66	57
% Heavy Vehicles <sup>2</sup>	1.6%	N/A	2.3%	2.2%
% Single Axle Double Trailers <sup>2</sup>	0.1%	N/A	0.2%	0.1%



Good stuff.



## Issues that Compound the Challenge and Problem

- Local businesses in resort areas have difficulty gauging needs because demand can ramp up fast
- Fuel demand at one of the airports in the mountains has ranged from 6 to 16 loads for one day during peak season. Fuel requirements for a local gas station generally takes a full tanker. At peaks they may need more than one load a day.
- Seasonal population in ski communities may be an increase of 2/3 or more over permanent residents – greater demand for all goods.
- Limited, if any warehousing or storage for businesses



Good stuff.



## Proposed Strategies for I-70

- Consider increase in passenger vehicle fines for inadequate tire tread
- Additional storage or warehousing capacity by businesses – i.e. - greater fuel storage at airports in mountains
- Evaluation as to impacts of community restrictions on truck travel
- Providing trucking operators with “drop keys” allowing for night time or early morning deliveries
- Look at land use regulations regarding whether businesses must have a certain amount of storage space



Good stuff.



## Developments in the Environmental and Energy Areas

- ❑ 2014 Diesel Engine Standards - will have GHG standards and better fuel economy
- ❑ Alternative fuels – particularly natural gas offer a clean and domestic alternative for heavy duty trucks
- ❑ EPA SmartWay Technologies offer great opportunities to further reduce emissions via aerodynamics, idle reduction, etc.



Good stuff.



## Proposed Environmental and Energy Strategies

- ❑ Legislation to Provide Incentives for Heavy Duty Alternative Fuel Vehicles and EPA SmartWay Technologies to accelerate the adoption of cleaner burning and more fuel efficient vehicles.
- ❑ Consider a State-supported Modernization Program Retirement/Scrappage Program for Pre-2003 Trucks
- ❑ Incentives via the Bid Process or Contract Requirement that Companies working under State Projects with Any Heavy Duty Truck (over 26,000 lbs. GVW) Older than 2007 be Equipped with a diesel oxidation catalyst (DOC) - Grant funding is available to do this.
- ❑ Encouraging Colorado Shippers and Transporters to Join EPA SmartWay Program



Good stuff.



## Transportation Funding

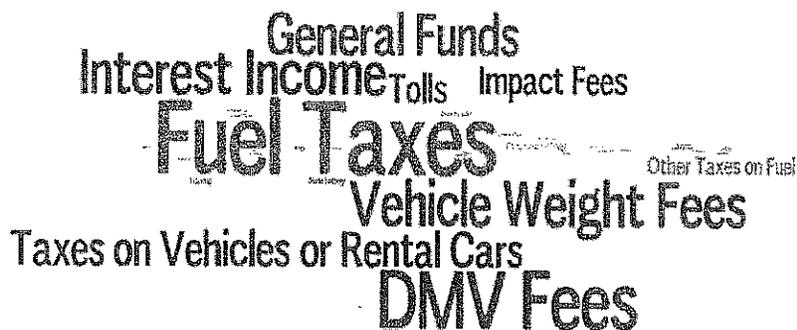
Transportation Infrastructure Has  
Been a Top State Issue in 2013 as  
identified by NCSL



Good stuff.



## State Option for Funding Transportation Needs



Good stuff.



## Transportation Taxes and Fees on Trucks for Colorado and Surrounding States

(based on a new \$125,000 interstate tractor operating approx. 100,000 miles/yr. - does not include taxes and fees on trailers or local taxes)

	Colo.	Wyo.	Utah	Kansas	Neb.	Ariz.	New Mex.
State Fuel Tax - 20,870 Gallons - ann.)	\$4,278	\$5,008	\$5,113	\$5,246	\$5,551	\$5,644	\$4,775
Registration Fees	\$2,350	\$2,637	\$1,821	\$1,770	\$1,286	\$3,960	\$190
Specific Ownership Tax (Property tax on vehicles)	\$2,625	0	0	0	0	0	0
Wgt. Distance	0	0	0	0	0	0	\$3,502
Highway Surcharge Fee	\$39	0	0	0	0	0	0
Bridge Fee	\$32	0	0	0	0	0	0
<b>Total</b>	<b>\$12,274</b>	<b>\$5,645</b>	<b>\$6,934</b>	<b>\$7,016</b>	<b>\$6,837</b>	<b>\$9,594</b>	<b>\$11,467</b>



Good stuff.



## Lack of Uniformity in Truck Registration Fees

### Annual Colorado Truck Registration Fees

Assumptions:

- Five axle tractor
- Intrastate transporter
- 50,000 miles or greater annually
- Registered weight of 80,000 lbs. GVW

Same truck transporting the same registered weight and traveling the same distance annually, yet based on the type of use, registration fees may differ by over 500% or more.

Common Carriage (for hire)	Private Carriage	Non-Registered Truck	Utility-Owned Truck	Specialization
\$2350	\$1975	\$1070	\$400	\$400



Good stuff.



## Key Legislative and Regulatory Concerns in Colorado

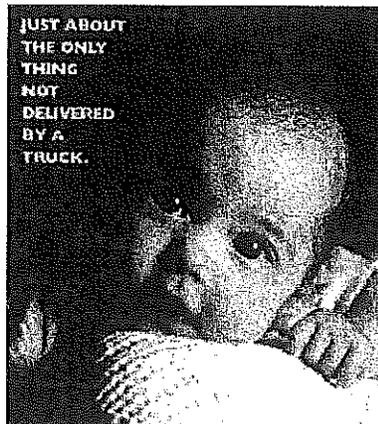
- Plethora of Oversize/Overweight Permits by Local Communities
- Truck Productivity – need to allow more productive vehicles along with uniformity and consistency with surrounding states
- Challenges to owner-operator/independent contractor model
- Access issues with communities
- Serious Driver and Mechanic Shortage
- Lack of current infrastructure, capacity and access



Good stuff.



*If you got it, a truck brought it.*



JUST ABOUT  
THE ONLY  
THING  
NOT  
DELIVERED  
BY A  
TRUCK.



**Attachment O can be viewed at State Archives.**