ROAD AND BRIDGE

2010 ANNUAL REPORT

LARIMER COUNTY
COMMITTED TO EXCELLENCE

PUBLIC WORKS DIVISION

Developing and Delivering
Innovative Infrastructure
Maintenance and
Improvement Solutions
Today, for Tomorrow.

A note from our Director

Welcome

to the 2010 edition of your Larimer County Road and Bridge Department's annual report. In addition, we have included our first five year review, as do this year's reports from each of the departments within our Public Works Division!

Within, you should expect to find numerous images and articles chronicling both our past and present efforts to protect and improve your local transportation network. Our efforts are intended to make an effective, efficient and safe transportation system possible, positive and routine for you each day. All of the photos and descriptions are evidence of, and contributed by, our single greatest resource, our employees (both past and present).

Our responsibilities and mission include the recognition of the importance of a properly planned, constructed and maintained transportation system. This has been aptly described and supported in a Strategic Planning End Statement approved by the Larimer County Commissioners – "We will have safe, efficient and adequately maintained transportation systems."

Our role, in supporting this commitment to you, is to plan, build, maintain and monitor your transportation infrastructure continuously. We pay specific attention to both changing conditions and the impacts of our actions relative to roadway Capacity, Surface Condition, Safety and the Cooperative Efforts we make routinely to stretch the benefits of our funding by working with others.

We are typically leaders, not followers. When the conventional wisdom yields an appropriate and desired result, we support it. When it does not, we leave it by the wayside and create from scratch using our extensive experience, a new solution, methodology or technique to accomplish our purpose. One example, is our innovative approach to paved road maintenance. Interestingly enough, copycat versions are now being represented in some circles as the "latest and greatest" within the industry.

We hope and expect that a similar result of copycat leadership may follow across all Larimer County divisions, based on our Leadership, Accountability, Measurement and Performance (LAMPS) initiative as developed by Marc Engemoen, our Public Works Division Head. This effort is founded in the need for each department to ask itself two fundamental questions … "Are we doing the right thing?" and "How do we know if we are doing the right thing?" The Road and Bridge Department has initially embraced this effort by tasking a group of twelve employees, each with varying job duties and levels of responsibility, to establish performance measures that will empower our customers, the Board of County Commissioners and our employees to hold our department accountable to "do the right things and do them effectively and efficiently."

We hope you will enjoy learning about your local transportation system and the services we provide. Please take the time to let us know how we are doing. If you have any questions, comments or suggestions for future articles, please do not hesitate to contact our administrative offices at (970) 498-5650 or me directly (970) 498-5653 or dmiller@larimer.org. We will respond promptly.

Please enjoy your trip through these pages.

Pothole Prevention

Article by: Lonnie Berett
Paved Roads Group Manager

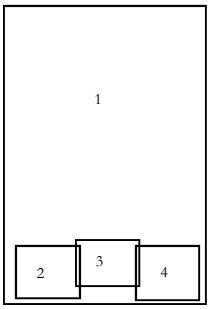
Right—Robin Mayhew (Team Leader) and her crew place crack seal material on one of our county roads.

Left—Steve Kuhn uses our Durapatcher to place a spray injection patch on a low spot that was holding water and beginning to crack.

Our pavement maintenance crews are trained to recognize pavement distresses that can develop into potholes. By identifying these distresses early, they can be fixed before they develop into potholes. The earlier you address and repair these distresses, the less it costs. Water is one of the main causes of failure to our paved roads so the more we can do to get it away from the pavement prolongs the life of the pavement.

Crack seal and injection patching are just two of the methods we use on our roads. A good shoulder and drainage maintenance program helps get the water off the road and away from pavement. We strive to keep our paved roads as pothole free as is economically feasible.

On The Cover:



1. Late Fall on Devils Gulch Road (LCR 43) below Glenhaven.
2. Chris Hubberts plowing snow on LCR 23 at Horsetooth Reservoir.
3. Mike Mossburgh clearing snow off of Horsetooth dam with a loader.
4. Jim Hunter plowing near Horsetooth Reservoir.
Photographer: Lonnie Berett

Your Larimer County Transportation System	Includes: 476 miles of paved roads 451 miles of non-paved roads 202 major structures (bridges with a span of 20 feet or more) 441 minor structures (crossings which span from 4 feet to 20 feet) 3009 culverts (this does not include the many driveway culverts)

Structures Maintenance

Article by:
Phill Osler, *Structures Group Manager*
Photos By: Gary Ellerman and Phill Osler

Above—On CR 51A south of CR 2E the crew removes vegetation from the flow line at the bridge

The Larimer County Road and Bridge Structures Group is responsible for maintaining and monitoring the structures component of the county's transportation network.

This component is comprised of over 600 bridge type structures, approximately 3,009 drainage cross-culverts serving drainage basins for over 2,600 square miles of water runoff and over 1,800 linear miles of roadside drainage throughout Larimer County. While these tasks seem overwhelming at times, they are certainly manageable given the quality and talents of the 15 individuals that make up the Road and Bridge Structures Group.

Above—The Bridge Crew cleans bridge on CR 74E (Redfeather Road) in preparation for painting.

Some of our current methods of monitoring and maintaining these assets include;

- 2 year inspection intervals for Major Structures. (structures greater than 20' in length);
- 5 year inspection intervals for Minor Structures. (structures less than 20' in length);
- An annual designation of $1 million annually for contracted major bridge repair or replacement;
- Collaboration with private sector contractors and other governmental agencies to ensure best practices in maintenance techniques and processes;
- Continuous education and training of our maintenance personnel to keep pace with the newest most efficient methods; and
- Utilization of unique engineering and management practices to preserve these valuable assets.

The next time you cross over that bridge or drive across that driveway culvert, please take time to consider the efforts and commitment of this important and talented division within the Larimer County Road and Bridge Department. They take great pride in providing these services to the citizens of Larimer County.

Crew performs maintenance on bridge below Glenhaven

Above—Not your typical culvert cleaning, Mike Barnhart uses the hose to clean debris from the culvert while Steve Thorne operates the 5500Vac

Dale's wife Bev looks on as he accepts the Elaine Spencer Award at the Colorado Counties Incorporated meeting on November 30, 2010.

Colorado Association of Road Supervisors and Engineers (CARSE) Award

Dale Miller, Larimer County Road & Bridge Director, received the Elaine Spencer Award at the Colorado Counties Incorporated/CARSE annual meeting in Colorado Springs on November 30, 2010.

The Elaine Spencer Award memorializes a former Larimer County Engineer and is awarded to a CARSE Member for outstanding service to the organization. It has only been awarded three times. Dale has been a great supporter of CARSE since joining in 1991. During that time he has been a board member, officer and he currently serves as the legislative liaison between CARSE and the Colorado Counties Transportation and Telecommunications Steering Committee.

Right—This is one of our newer road graders. It is shown here with a heavy-duty 2-way plow that can be attached or removed in a matter of minutes.

Left—Two sand/salt spreaders and a water tank hang on racks ready to be loaded into dump truck bodies when they are needed.

Right—Jim Hunter pulls the pins that hold the tailgate on the truck so it can be removed before loading the spreader.

Snow Removal Equipment:

Article By: Justin Hersh, *Material and Equipment Manager* *Photos By: Ted Jensen and Jim Frick*

Snow and Ice Removal equipment needs to be specified, designed and built for the task at hand. Our equipment has to perform in some very arduous and extreme conditions and environs. Snow and ice removal equipment is typically pushed to its limits even during one of our normal storms- due to cold, moisture and chlorides found in many of today's de-icing agents.

Since we see snow only during part of the year, this equipment can be a costly investment for little use. Therefore, we strive for total utilization from most of our equipment. Snow and ice removal is the basis of this ideal. For example, the 33 tandem-axle dump trucks that we use for our year-round hauling operations are also snow-plow trucks. This involves attaching a 12 foot snow plow, removing the dump-box tailgate, and installing a 14 or 16 foot sander into the dump-bed. Two employees can transform a dump-truck to a plow-truck (or vise-versa) in a matter of minutes. Another example would be our fleet of motor-graders. We use 16 motor-graders to maintain our non-paved road system and to provide depth to our snow removal operations. Within a few minutes, a motor-grader can be up-fitted with either a heavy duty reversing snow plow or a v-plow. These six wheel drive machines are a very formidable snow removal tool.

To say the least, we are very proud of our snow removal capabilities- especially when you recognize the total-use aspect of our fleet.

Right—Myron Smith pulls the truck into position while Robert Pina hooks up the plow.

Above—Jim Hunter backs the truck up in preparation to load the spreader.

Above—Steve Cabrera (Team Leader) guides the truck back to load the spreader in the truck in preparation for a forecast snow storm.

Spring Brings Challenges To Our Roads

Article and Pictures
By Jim Frick, *Non-Paved Roads Manager*

Spring in Larimer County presents many different challenges to address on the non-paved roads. The runoff in the mountains can cause many problems for our roads due to the amount of water our roadside drainage ditches must handle. We have natural springs pop up in hazardous places sometimes causing the roads to be partially or completely impassable. The runoff often causes sink holes, washouts and even flooding on some roads.

There is really no way to predict or completely prevent these occurrences. They are dealt with when they occur. We strive to keep our roads safe and passable for the public. In the lower elevations there are similar situations with the drainage and pot holes on our roads which are also directly related to the amount of runoff and spring moisture we receive. Our goal is to keep our road system the best it can possibly be within the constraints of our annual budget.

Above—A natural spring occurrence in the middle of CR 59 near the Wyoming border.

Potholes starting to develop on gravel roads as a result of spring moisture.

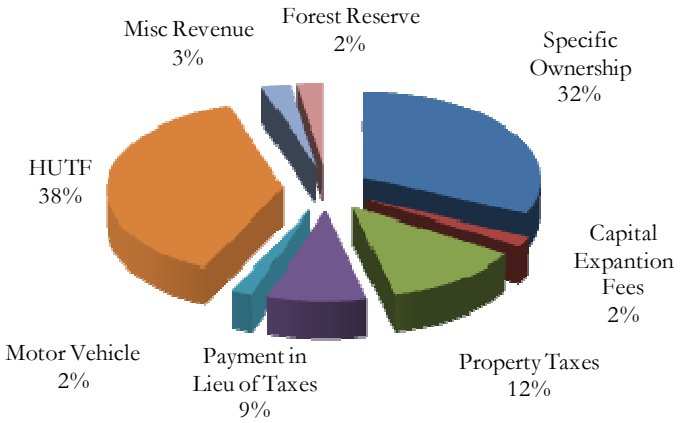
This is what it looks like after being graded and rolled.

Below—Here is a large sinkhole in the road that appeared suddenly when one of our county trucks drove across it. This road failure resulted from water running along the outside of a culvert when the water flow was more than the culvert could handle.

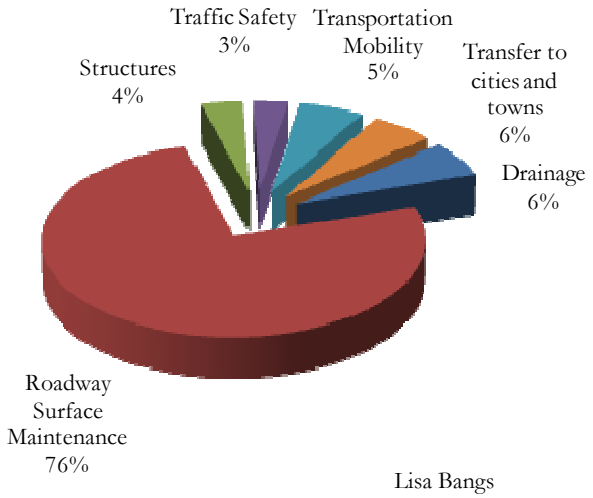
Below—The runoff was more than the ditch and culvert could handle so it started a new ditch of its own.

Summary of Finances

2010 Revenues
$19,924,626



2010 Expenses
$17,775,259



These figures are un-audited. Audit to be complete mid 2011.

Lisa Bangs
Senior Accountant

Definitions

Revenues

Capital Expansion Fees are collected at the time a building permit is issued and used to fund improvements required to maintain adequate levels of service on Larimer County's major road system.

Forest Reserve is a share of revenues generated from National Forest Lands and distributed by formula to local government.

Highway Users Tax Fund (HUTF) is gas tax distributed by the State Department of Revenue based on annual local road system maintenance mileage reports submitted by eligible jurisdictions to the Colorado Department of Transportation (CDOT).

Miscellaneous Revenue includes Federal Stimulus grants and CDOT grants.

Motor Vehicle Tax is collected by the Colorado Department of Revenue for vehicles with mounted equipment and is distributed to counties based on miles of state highways per jurisdiction and proration of property taxes levied by jurisdiction.

Payments in Lieu of Taxes (PILT) are Federal payments to local governments that help offset losses in property taxes due to nontaxable Federal lands within their boundaries. The federal government recognizes that the inability of local governments to collect property taxes on Federally-owned land can create a financial hardship.

Property Tax is a levy on the value of property owned based on the assessed value as determined by the Larimer County Assessors Department.

Specific Ownership Tax comes primarily from ownership fees paid when vehicles are licensed. It is tracked by the Clerk and Recorder's Office and distributed by the Treasurer.

Expenses

Drainage represents the costs associated with the planning, construction, maintenance, repair and management of the County's roadside drainage and storm water systems.

Roadway Surface Maintenance includes the maintenance and preservation of our paved and non-paved road network. Work accomplished includes: surface grading, application of new gravel and dust suppressant, pothole patching, structural patching, overlay, chip seal and application of seal coat materials.

Structures represents the County's commitment to maintaining our bridge program which involves the management, design, construction and rehabilitation of Larimer County's major and minor structures (bridges).

Traffic Safety includes cost analysis, problem identification planning, and management of roadway safety concerns through installation of signage and safety improvements.

Transfer to Cities and Towns is the portion of the Road & Bridge Mil Levy (property tax), required by statute, to be shared with the cities and towns where it is collected.

Transportation Mobility is comprised of transportation master planning, project identification, design, and construction of capital improvements to the County's roadway system. Our capital improvements address roadway condition, capacity and safety needs.

Snow Plow Operators Making a Difference

Steve Johnson

Steve Johnson has plowed snow out of our Waverly facility for going on 6 years.

Last winter Steve was plowing snow while training Cal Smith, one of our seasonal employees, when they noticed a car off in the ditch. The car had slid off the road backwards. It was now facing the road with the engine running and the wheels turning. They could not see anyone in the car as they plowed past it but decided they should take a closer look. Steve pulled the plow to a safe spot at the edge of the road and they went to check the car.

When close enough to see in the window, Steve saw there was a man in the car. The man had laid the seat back, covered himself with a blanket and possibly fallen asleep while waiting for help. Steve could see that the man was having difficulty breathing and immediately suspected carbon monoxide poisoning. Steve shut the car off while Cal rolled down all of the windows. Cal had a cell phone and called 911 for help. While waiting for the ambulance to arrive they made sure the road was sanded for them and monitored the victim's condition.

If it had only been minutes longer before Steve and Cal arrived to help, the victim may not have survived. Way to go Steve and Cal, for going that extra step above and beyond what is expected of a snow plow operator!

Larimer County will add value to the lives of its citizens by:

Building Partnerships

Being Customer Driven

Empowering People to Take Responsibility

Being a Fulfilling and Enjoyable Place to Work

Contact Information

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Monday - Friday

On the Web at:
www.larimer.org/roads

Public Works Division

Marc Engemoen, Director

Engineering

Fleet

Natural Resources

Road and Bridge

Solid Waste

The Ranch

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Road and Bridge Satellite Facilities

Estes Park
543 Elm Avenue
Estes Park, CO 80517
970-586-2840

Loveland
2205 East SH #402
Loveland, CO 80537
970-679-4514

Livermore
124 West CR 74E
Livermore, CO 80545
970-493-7826

Stove Prairie
17218 CR #52
Bellvue, CO 80512
970-493-8612

Waverly
241 W. CR #70
Waverly, CO 80549
970-498-5660

Laramie River
21137 CR #103
Glendevey, CO
mail: Jelm, WY 82063
970-435-5718

This publication is printed on recycled paper.

ROAD AND BRIDGE

LARIMER COUNTY
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PUBLIC WORKS DIVISION

2006 - 2010 Five Year Review

Identifying and adapting to changes for constant improvement of our transportation system

As of Dec 31	% Poor	% Fair	% Good	% Very Good
2001	9	11	16	64
2002	8	12	20	60
2003	7	15	25	53
2004	7	17	22	53
2005	6	16	20	58
2006	5	10	21	64
2007	7	8	21	64
2008	6	8	24	62
2009	3	10	26	61
2010	4	10	24	62

Mainline Paved Road Condition Trends

Paved Roads System

Over the last five years, we have improved the data repository for our paved (and non-paved) road surface conditions. This data, and its corresponding analysis, validate and support our innovative surface maintenance methodologies. Our regularly scheduled maintenance program is functioning well by helping us to keep our paved roads in a reasonably good overall condition.

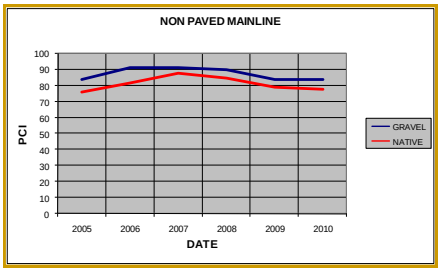
Our overlay program averages about ten miles of structural road maintenance improvements each year. We also use paving fabrics to retard reflective cracking in pavements and thereby extend the benefits of our program.

Our current paved road surface maintenance program is scheduled to address each paved road every seven years. As the chart above shows, our methods are meeting with success while we continually explore additional innovative approaches.

Non-Paved Road System

The last five years have seen us move away from the use of Magnesium Chloride for non-paved road stabilization/ dust control treatment efforts and to more environment friendly products. With that move, challenges for maintaining our non-paved roads have increased. Unfortunately, the more environmentally friendly products are more expensive per gallon, require higher application rates and do not perform as well (as shown in the graph below).

In addition, the years have allowed us to develop our crushed aggregate road base gravel specification to that which performs in a superior fashion as both a surfacing material on our treated non-paved system as well as a structural member of a pavement section when those surfaces are transitioned to pavement. So, we are always in search of new treatment materials and regimes to combat the increasing costs of maintaining non-paved roads.



Railroad Crossings

Our commitment to railroad crossing improvements has continued in full force over the last five years. We believe that an otherwise acceptably smooth section of road is perceived to be "rough" if it is interrupted by a less than desirable RR Crossing. Our work typically is made affordable through partnerships with the several railroad companies serving our area. Typically, our efforts include improvement to both ride quality and safety. Specifically, we add concrete crossing materials outside and between the rails; bells; lights and gates; as well as our own approach design which makes a smoother and safer ride in the proximity of the rail crossing. Over the last five years, we have improved the crossings on CR 2E, 15A and 16 between CR 15 and CR 17; and the crossings on CR 58, 56 and 54 between I-25 and CR 9. This past winter the crossings on CR 19 north of CR 56 and on CR 56 just east of CR 19 were upgraded.

Structures

Our Bridge (Structures) funds are the result of an internally developed calculation and allocation of a portion of the revenues we receive from the Highway Users Tax Fund. We currently allocate $700K for major structures and $300K for minor structures annually. The last five years have proven the worth of our approach as we have reduced the numbers of both our Structurally Deficient and Functionally Obsolete Bridges over the period.

Before and After

Maintaining Safe Roads For Larimer County

Improving Our Versatility Through Equipment and Material Choices

Roadside and Crossroad Drainage

As our system becomes more urban in nature we have added appropriate new specialized equipment for drainage maintenance. The first two additions have been a VAC (vacuum) truck and a Gradall excavator. The VAC truck has both a high pressure water jet to flush out culverts and a high performance vacuum that sucks up the resultant debris for disposal. The vacuum is powerful enough to also be used for non-destructive excavation in buried utility location.

The Gradall employs a hydraulic wrist action which makes it ideally suited to cleaning roadside ditches. The fact that its carrier is an on-highway truck makes it very mobile and easy to move from one location to a distant other.

To compliment these new tools, we have begun taking a new approach to the buried conveyances from which our drainages flow to and from. Whenever possible, we now use reinforced concrete pipe (RCP) for our crossroad culverts. This is especially the case on our paved road system. This class of pipe, while initially more expensive, is capable of outlasting metal pipes many times over, thereby reducing our lifecycle cost to maintain.

Equipment

As we replace equipment according to our equipment replacement plan, we continue to focus on the total cost of ownership benefits of multi-use capabilities and the dividends paid by acquiring high quality heavy equipment to maximize our resources. An example is found in our selection of tandem dump trucks. We have chosen a combination of engine, transmission, suspension and final drives that give us unsurpassed capabilities when used for hauling road materials, snow plowing and sanding, and when used as a water truck with our slide-in power spray water tanks. The transition between any of these configurations takes but a few minutes.

Our approach to equipment replacement also considers the cost downtime to our production and job costs, let alone the expense of associated excessive repair costs. There is a difference between the quality and value of various manufacturers and component suppliers. We also recognize the importance of both selling a unit before it reaches the high maintenance period, and equipment configured as the public prefers, gives us the best return at resale.

Signs and Pavement Markings

Over the past five years we have controlled our costs for pavement markings, allowing only a 2% increase over the period. This was partially due to our switch from solvent based paint to a water soluble latex paint. The latex paint has also proven to be durable and environmentally friendly.

New Federal regulations (unfunded mandates) continued present challenges through the period. More stringent requirements for sign retro-reflectivity have increased our costs of reflective sign sheeting and larger sign letter sizes. In response, we have developed a plan for maintaining appropriate reflectivity for all of our signs.

Snow Removal

Over the past five years we have transitioned from using primarily a sand or sand/salt mixture for snow and ice control to adding a pre-wet salt product to the line-up. Our partnerships with local and state agencies support this approach.

Cost Control and Performance Measurement

The past five years have seen us continue our decades long emphasis and reliance on cost accounting measures to help manage our maintenance activities. We have also embraced several tools focused specifically on measuring the current and long term performance trends of our field maintenance activities.

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Road and Bridge Department – Then and Now

	2006	2010	
Cost of one pound of White Bread (Dec)	$1.14	$1.38	21%
Cost of one gallon of Unleaded Regular Gas (Dec)	$2.33	$2.98	28%
Cost of a Tandem Dump Truck w/plow and sander	$145,625	$182,890	25%
Cost of 6x6 Road Grader w/ plow	$251K	$298K	19%
Average Cost of Plowing a Snow Route One Time *1	$476/Route	$501/Route	5%
Cost to Maintain Pavement Markings *1	$372K	$379K	2%
Cost of Applying Dust Suppressant to one mile of road *1, *2	$2,962	$4,748	60%

*1 Includes Labor, Equipment and Materials
*2 Magnesium Chloride as a Stabilization Material versus More Environmentally Friendly Products