

2013

Larimer County Engineering Department Annual Report

Engineering A Better Future For Larimer County



A Message from the Department Head

Unexpected Events - AGAIN

Just one year ago in this column I discussed the surprise, challenges, and significant efforts of the Engineering Department in response to the High Park Fire. Little did we know that just 13 months later, we'd put all the experiences and learning to use again in a much broader, and more impactful disaster.

This report tells the story of the flood from the perspective of the Engineering Department.

The flood devastated the infrastructure on our roadway system, severing ties between communities, and cutting off people from their homes. Our early focus was on assessing the damage, developing a plan for emergency repairs, and working as quickly as possible with a host of contractors to rebuild roads.

In less than 100 days, access to mainline roads was restored for all but a small handful of homes.

It's easy to think that the flood work is mostly about road building, but you'll see on page 6 that in some way, the entire department was integral to our efforts.

As we now move towards the summer, the staff is shifting to the planning, design and construction of permanent repairs on miles and miles of roads. We know that we'll still be working on flood recovery for years to come.

Yet despite all the necessary focus on flood recovery, some of the daily tasks we typically do could not be delayed. A number of department staff continued to do their regular jobs extraordinarily well in addition to extra flood-related workload. The back page of this report identifies some of the other projects we've completed in 2013.



Department head Mark Peterson (left) bikes with staff to survey roadway damage in the early days following the flood. In many areas, assessments were only possible by air or on foot.
Photo: Rusty McDaniel

This past year has been challenging and exhausting, but also highlighted the extraordinary dedication of our staff to the citizens in the County. I'm honored and privileged to work with these professionals

Mark Peterson, PE
Engineering Department Head

When The Waters Came

In September 2013, Larimer County suffered the most significant natural disaster to occur in the history of Larimer County.

In comparison, during the Big Thompson flood in 1976, while loss of life was significant, the scope of the disaster was limited primarily to just one canyon.

And during the High Park Fire in June 2012, while a greater number of homes were lost, transportation infrastructure damage was very limited.

This disaster combined a very wide area of impact, significant personal effect on thousands of residents, and an unprecedented catastrophe on transportation infrastructure.

CR 47 towards big Elk Meadows on the night of September 12th, 2013
Photo: Dale Miller



On The Cover: Assessment Team evaluates the damage to Fish Creek Road (CR 63) in the Estes Park after the flood.

Comparing Disasters

	<i>Lives Lost</i>	<i>Homes Lost</i>	<i>Infrastructure Damage</i>
1976 Flood	144	418	\$35.5 million*
2012 High Park Fire	1	259	\$ 2.0 million
2013 Flood	2	89	\$100 million*

*Estimated

Unprecedented County-Wide Infrastructure Damage



Summary Of The Damage

(Larimer County Roadways Only)

65 bridges and large culverts significantly damaged or destroyed

25-30 miles of roadway completely obliterated

2,200 properties without access

Repair estimate \$100 million

In comparison, the entire transportation effort and budget for the County in a 'normal' year includes:

2-3 bridges and large culverts

1-2 miles of road

Total transportation budget \$20 million

*E*mergency Repairs

Even as the rain was still falling, the scope of the disaster became increasingly clear. Engineering staff immediately began planning for the rapid damage assessment and the emergency repair process. Initially, we:

- Assessed all mainline roads within seven (7) days (by ground and air). See sidebar on next page.
- Completed county-wide bridge inspections within 14 days.
- Generated damage summaries and costs
- Began intensive coordination with other agencies (FEMA, FHWA, CDOT, etc)
- Amended existing contracts to allow construction work to begin.

Construction crews were working in numerous locations within days of the event with an initial focus on reconnecting communities and properties along the mainline road system.



Progress to Date

39 construction sites

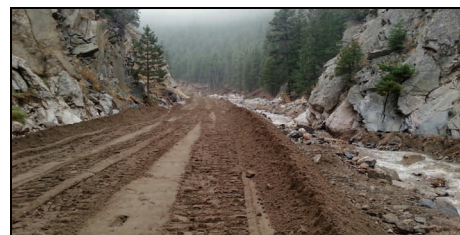
More than **50** bridges and large culverts repaired/rebuilt and reopened

About **30** miles of temporary roadway built

More than **2,150** properties reconnected

Emergency Repairs Cost about

\$6 million



Various Other Recovery Efforts

There are a number of areas that Engineering Department staff are focusing on in addition to the road rebuilding efforts.

Natural Resource Conservations Service (NRCS) Exigent Needs Restoration sites

The NRCS is using \$3 million Emergency Watershed Protection funding to complete riverbank stabilization at about 37 sites throughout the County.

The County is the local sponsor for the work, and Engineering Department staff are completing coordination and agreements with property owners.

Rebuilding Options and Process for Residents

Property owners in the flood area with damaged homes are receiving significant information and support from Engineering Department staff.

Property specific information on damage estimates, floodplain delineation and

rebuilding options have been provided to each owner.

A specialized permit called the Emergency Work Permit was created to expedite approval of allowable work in the floodplain.

Dealing with Debris

Debris is a serious concern and close coordination with the debris efforts is ongoing.

Supporting Residents Who Couldn't Access Their Homes

The Federal Emergency Management Agency (FEMA) provided financial support to residents that could not access their homes. Department staff provided regular and ongoing documentation and proof of no access for residents to submit to FEMA in order to qualify for the subsidy.

Technology Proves Vital for Damage Assessment and Information Management

In-house technology created to manage aerial mulching efforts following the High Park Fire in 2012 was repurposed in the first hours after the flood to manage flood damage assessments.

Crews were deployed across the County with iPads that could capture damage, location, and geo-referenced photos that could be easily uploaded into a comprehensive system to track damage.



*Bill Gleiforst uses an iPad to quantify damage on County roads.
Photo: Martina Wilkinson*

Partnerships made a difference

In the immediate aftermath of the flood, it was critical to get construction crews into the field as quickly as possible. County staff worked very closely with the numerous local contractors to modify existing contracts to allow for flood repair work.

Evaluations and decisions were cooperatively completed in the field. The existence of strong existing professional relationships that have been developed over the course of years were a key part in being able to quickly work on flood recovery efforts.



Bladeworks



I t takes a Whole Department... .

The ability to quickly respond to flood-related needs highlights the benefit of skilled and dedicated in-house staff.

Many staff members were tasked with work in their areas of professional specialty. Other employees volunteered to support the efforts in areas of strength or interest (such as public interaction or administrative skills).

Engineering Department staff has spent literally thousands of hours of time, both during normal work hours and countless evenings, nights, and weekends working on flood-related issues in all disciplines of the department.

Survey

The survey crews completed much of the early field work to develop damage assessments. They are now working on survey for permanent repair projects.

Construction Management

The construction management staff was absolutely critical especially in the early weeks and months following the flood as they oversaw all the emergency repair work in the field without benefit of design plans.

Engineering Design

The engineering design team is managing much of the work, both temporary and permanent. This includes roadwork as well as stream restoration work.

Land Agents

Land Agents have worked extensively to clarify private or public road dedication, and gain written permissions from hundreds of property owners for road and river work.

Traffic

Traffic staff has been busy with road closure information, and developing appropriate speed limits and signing for

the primitive roads as they were completed and reopened.

Stormwater and Floodplain Management

Staff that oversees flood risk in the county has been working very closely with hundreds of residents on providing as much information as available on rebuilding options.

They have also been coordinating with federal and state partners on master planning and re-mapping.

Development Review

The development review team is assisting residents in navigating the re-building process, including a newly created emergency work permit.

Coordination Efforts

A number of staff have been actively involved in coordination efforts among local communities, as well as a myriad of state and federal agencies including CDOT and FEMA.

Dealing With the Paperwork

The paperwork that is required on a large scale disaster is immense. Staff is tracking contracts, funding, expenditures and reporting on each project location to ensure as much federal reimbursement as possible.

Public Information/Outreach

Early outreach efforts were primarily occurring at the Disaster Assistance Center where staff spent several weeks providing information to evacuees.

A weekly transportation bulletin published on Fridays served as a summary of current and upcoming work, and status on road closures. A number of staff also supported information efforts through answering phone calls, web information and public meetings.

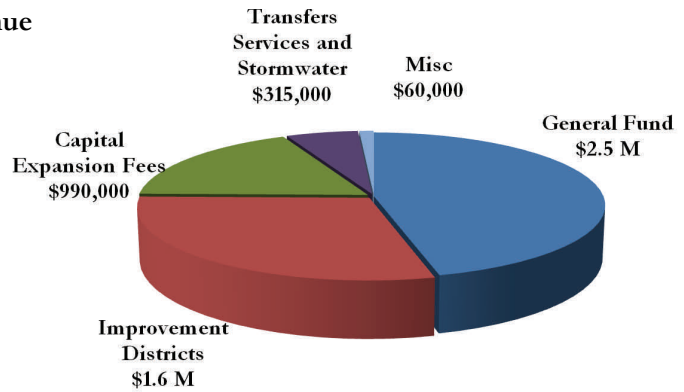


Engineering Department Major Service Areas:

- Asset Management
- Bridges
- Construction Management
- Development Review
- Engineering Design
- Improvement Districts
- Permitting
- Right of Way
- Stormwater and Floodplains
- Survey
- Traffic/Transportation Planning

Summary of Finances

2013 Revenue
\$ 5,527,000

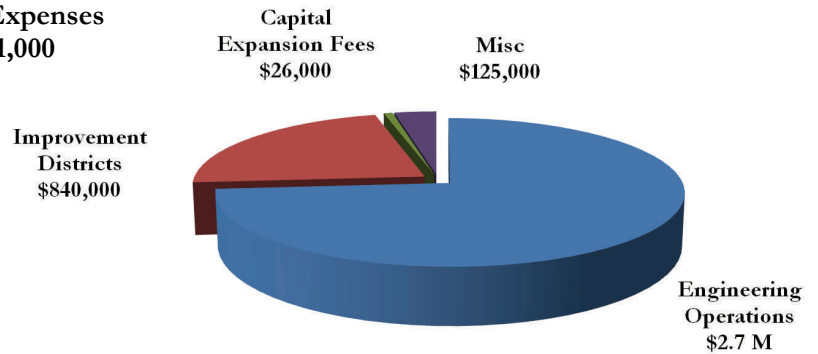


Engineering Department funding comes primarily from the County's general fund. As part of a County-wide budget reduction, the 2013 budget for Engineering Operations was reduced.

During 2013, the Engineering Department designed and managed the construction of approximately \$3.0 million of improvements for roadways and bridges (in addition to \$840,000 of work in the 52 active improvement districts).

The large difference between revenue and expenses for Improvement Districts reflects decisions by road boards to save funding for future projects.

2013 Expenses
\$ 3,771,000



These figures are unaudited. Audit to be completed mid 2014.

Planning for permanent work

Many of the mainline roadways built last fall were intended to restore access to properties and communities as quickly as possible. These temporary roads could be impacted by high spring runoff or storm events. Permanent repairs will need to be made to many of the roadways and those efforts are already underway. This includes cooperative agreements among local entities (such as Town of Estes Park) to complete work together.

Engineering design firms have been selected to complete the design work.

Since permanent work requires adherence to normal environmental permitting, those efforts are also underway.

Consideration is being given to



Many of the roadways built immediately after the flood are temporary and more permanent repairs are needed. They will be built over the course of the next few years. (photo: Gabe Rountzahn)

'betterment' projects that would not just replace the roadway in kind, but upgrade the design to current or enhanced standards. This includes efforts to explore the viability of relocating roadways away from creeks / rivers if appropriate.

It is expected that permanent work will take several years to complete.



Yet life (and projects) go on...



An old wooden bridge on County Road 54G over the Jackson Ditch was replaced. (Photo: Gabe Routzahn)



Installation of large box culverts was completed on Rist Canyon Road (CR 52E). (Photo: Gabe Routzahn)



Engineering interns are hired each summer to collect vital road condition information.



Large concrete blocks were installed in areas affected by the High Park fire to redirect debris and runoff flows and protect property.



Several rain gages were installed to provide information on flooding following the High Park fire.

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