

# Colorado LTAP

May 2006

Serving local transportation agencies throughout Colorado

Summer Issue

## When to Pave a Gravel Road? Economics of Upgrading an Aggregate Road



*If more than 100 vehicles use this road each day, it's time to plan an upgrade.*

**P**aving a gravel road sure isn't cheap, and maintaining one also eats into your budget, especially as traffic volumes increase. A new report - *Economics of Upgrading an Aggregate Road* - helps county and municipal governments make policy decisions for maintaining and upgrading gravel roads. Published by the Minnesota Department of Transportation (Mn/DOT) and the Minnesota Local Road Research Board (LRRB), the report will also help the public understand why counties and townships choose their policies and use certain construction and maintenance techniques.

The report, written by primary researchers Charles T. Jahren of Iowa State University and Greg Johnson of Mn/DOT, presents a method for comparing the cost of maintaining a gravel road with the cost of upgrading and maintaining a hot-mix asphalt, HMA, road.

In their work, Jahren and Johnson analyzed an example scenario that included costs of a five-year regrading

cycle with yearly grading, plus typical costs for HMA surfacing, yearly HMA maintenance, and a seven-year seal-coat cycle. The economic evaluation used the present-worth method over a 30-year analysis period.

### Cumulative Cost Trends

Using annual state aid reports, cost estimates, and interviews, Jahren and Johnson determined a typical county spending history for low volume roads. They found that while bituminous roads have high initial costs, gravel roads cost more for ongoing, routine annual maintenance in later years.

The graph of cumulative maintenance costs from one county (shown in Figure 1) verifies that annual maintenance costs per mile for a gravel road increase with traffic volume. Each county can plot a similar graph based on its own data.

The researchers then identified the relationship between travel level and maintenance cost. ...continued on page 5



**LOOK  
INSIDE**

**Longtime LTAP  
Instructor  
John Bemelen  
Retires**

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Gravel Road

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The seagull lamppost.  
Kobe port, Japan.

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The Colorado Local Technical Assistance Program is sponsored by the Federal Highway Administration, the Colorado Department of Transportation, and the University of Colorado at Boulder.

The Colorado LTAP Newsletter is published quarterly. Articles, pictures and comments are welcome.

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## Program Manager's Corner

Already Summer?! But we haven't had enough snow yet! Seriously, everyone who is tired of plowing, raise your hand. Many agencies are dealing with record snow fall and are anxious to get on to new tasks. Well, we're here to help. No snow mentioned in this issue, just a few items to help you segway into safe summer construction.



## ~LTAP COMING TO A CITY NEAR YOU~

In 2005, Colorado LTAP initiated the *Agency Outreach Program*. We started with the Eastern Plains and I spent a full week in August visiting 32 local agencies, city councils, and commissioners. Due to its

success last year, we will continue with the program visiting with one quadrant of the state each year. I will spend another full week in August this year visiting agencies along the Southern border of Colorado and we're taking requests. (We always bring fun stuff.) If you'd like us to visit your agency, meet with the Commissioners, or present at a council meeting, raise your hand! Send us your requests by phone, fax, or email and we'll try to squeeze as much into the schedule as possible. See you then!

*Renée Koller*

## Quotes of the Day

Once a new technology rolls over you, if you're not part of the steamroller, you're part of the road.

~ Stewart Brand

Space is big. Really big. You just won't believe how vastly hugely mind-bogglingly big it is. I mean, you may think it's a long way down the road to the chemist, but that's just peanuts to space.

~Douglas Adams, author of "Hitchhiker's Guide to the Galaxy"

When you come to a road block, take a detour.

~ Mary Kay Ash

No amount of travel on the wrong road will bring you to the right destination.

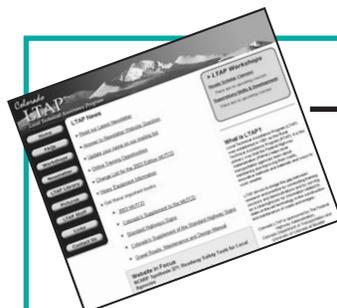
~ Ben Gaye, III

We know what happens to people who stay in the middle of the road. They get run over.

~ Ambrose Gwinnett Bierce, American writer

There are no speed limits on the road to success.

~ David W. Johnson



<http://ltap.colorado.edu>

Visit Colorado LTAP online today for online training, class registration, free lending library, and more.

# Elements of an Operations Manual

## How to help your staff understand and do their job better.

By: *Bill Sterling*, Director of PW retired, City of Greeley

With the many forces acting on public works agencies (i.e. regulations, revenue shortages, increased service requests, aging infrastructure, growth, personnel changes, and workplace diversity), a consistent method of providing services would be helpful to the agency. A standard response is essential to providing the most cost-effective services in a timely manner. An operations manual can function as a training document, a public awareness document, a description of the level of services provided, and a document that can be utilized during emergency or special situations. While an operations manual is essential to providing good services, the manual should not be so rigid that flexibility, innovation, and efficiency are restricted.

### What are the essential elements of an operations manual?

While it is not possible to develop a “standard” that fits all agencies, there are, in my opinion, some key elements that should be in any operations manual. The adoption of a manual from one agency may not “fit” your agency; however, it may serve as a guide.

The Greeley Public Works Department consists of 8 divisions. Each of the 8 divisions (Facility Management, Transit, Administration, Engineering, Street Maintenance, Traffic Operations, Stormwater Management, and Equipment Maintenance) has developed an operations manual that is specific to each division.

Elements that are included in the City of Greeley’s Public Works eight operational manuals are as follows:

#### A. Overview

- Introduction
- Purpose of Manual
- Description of Services Provided by the Division
- Mission Statements
- Workload Indicators
- Organization Chart
- Goals/Objectives
- Performance Indicators/
- Year End Report

#### B. Policies

- Job Descriptions/Responsibilities
- Location of Work Site
- Working Hours
- Attendance
- Time Tracking
- Training/Career Development
- Certificates/Licenses
- Special Policies
- Customer Service & Guidelines

#### C. Operations Procedures

- Statement of the Activity
- Personnel/Equipment Listings (Inventory)
- Preparing for the Season
- Specific Procedures for Services Provided
- Safety Procedures
- Emergency Procedures

#### Overview

The introduction of the manual should include its purpose. For example, “The purpose of this manual is to provide an overview of the Public Works {insert specific} Division and provide a policy and procedure guide for its operations. It is intended that this manual be provided to new employees, as a refresher to existing employees, and other interested persons.”

A short section that describes the mission, vision, values, goals, and objectives of the Division should also be included.

A description of the services that the Division provides (all of its program elements, i.e., snow/ice control, regulation control, street sweeping, drainage maintenance, building maintenance, signals, markings) should be included. The manual should also include a description of the workload indicators (miles of roadway, number of signals, number of reviews, etc). This is the amount of work for which this Division is responsible.

An organization and a function chart will provide an instructional graphic for both employees and the public.

A section on performance indicators (how well did you do?) should also be an important part of the manual.

...continued on page 4

### Colorado LTAP Advisory Committee Members:

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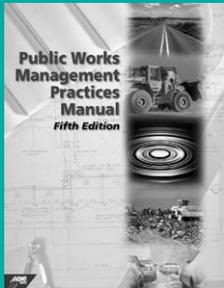
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**Renée Koller**  
Colorado LTAP



## PUBLIC WORKS MANAGEMENT PRACTICES MANUAL



APWA's *Public Works Management Practices Manual* is a tool to help local agencies develop or improve existing practices, enhance performance, increase productivity, and strengthen employee morale.

This newly-revised manual describes the basic criteria and procedures necessary to perform as a full-service public works agency and provides the framework for the object self assessment of an agency.

The manual can be loaned from the Colorado LTAP library, ordered online through APWA's bookstore, or by calling their Member Services Hotline at 800-848-2792, ext. 3560.

[apwa.net/bookstore](http://apwa.net/bookstore)



SAKE KEGS

## Elements of an Operations Manual

*continued from page 3...*

### Policies

This section includes policies that are specific to each Division. While many of the personnel policies are covered in a citywide policy, each Division has certain policies that are specific to that operation. These policies could include such items as location of work site, working hours, dress code, cell phone usage, reporting functions, ethics, job site behavior, attendance policies, and time tracking. Training opportunities and the maintenance of required certifications (i.e. First Aid/CPR, CDL licenses, equipment operations) are important considerations.

The manual should contain a section on customer service (i.e., citizen interaction, conduct, service surveys) and accountability.

Lastly, the manual could include any other policies/procedures that are specific only to that Division (i.e., fire extinguisher operations, radio procedures, office cleanliness, ethics, special equipment operation training).

### Operations Procedures

This section is the heart of any operations manual. This is where the "rubber hits the road". This section can be expanded to include any and all procedures on how to conduct a specific job function. Remember, the manual should not be so rigid as to restrict flexibility, innovation, and efficiency. Do not let written policies/procedures restrict your ability to respond efficiently and timely to the needs of the citizens and to situations. The manual should be proactive versus reactive. However, to be consistent in providing services, some specificity is required.

A critical element in this area is an inventory of personnel and equipment. The personnel inventory includes those individuals assigned to specific jobs. The equipment inventory should include a listing of equipment, both large and small, and supplies to be used for specific jobs (i.e., snow control, supply levels, stormwater maintenance, sweeping, signal maintenance).

A second important element is

"preparing for the season". Specific items could include getting plows/spreaders ready, readying mowers, paint truck preparations, ordering of materials and supplies, reviewing previous years' operations, reviewing increased responsibilities, and new regulations that may dictate methods and training sessions.

The third most important element is providing specific procedures and responsibilities for individual programs. This could include specific info on Capital Improvement Projects, engineering design review standards and process, construction in the public right-of-way permit process, disposal of used oil and waste products

from vehicles, vehicle repair priorities, custodial methods, facility inspections, project management, and security and work order systems. The manual should also include schedules for specific services (i.e. sweeping, mowing, blading).

Safety procedures could include safety training, accident reporting, job site safety (work zones), equipment operations,

shop/yard safety, and hazardous material handling. Emergency procedures should include such items as emergency response, current phone numbers of staff and key agencies, response modes (flood, tornado, fire, snow, etc.).

Any endeavor to develop an operations manual, or updating an existing one, must include extensive employee involvement. The people who do the actual work also have the expertise to improve the "how to".

To initiate an operations manual, a good reference would be APWA's *Public Works Management Practices Manual*. The specific chapters that deal with your operations are a good guide for developing an outline for an operations manual.

In closing, we all employ an "operational manual" to some extent. It's called institutional memory. Senior staff know how to do things based on how they did it in the past; this is called experience. The downside of this situation is how to train new employees, when senior staff retire.

If all else fails, read the instructions - or in this case, read the manual!



**Your operations manual should not be so rigid that flexibility, innovation, and efficiency are restricted.**

# When to Pave a Gravel Road?

## Economics of Upgrading an Aggregate Road

continued from page 1...

Though there was little data for either low-traffic paved roads or high-traffic gravel roads, the cost analysis showed an upward trend for gravel roads with increasing average annual daily traffic (AADT). In the AADT category with 150 to 199 vehicles per day - with nearly half paved roads, roughly the mid-point - bituminous and gravel maintenance costs were similar.

### Recommendations: Gravel to Hot Mix

Based on their findings, the researchers recommend that counties and townships give serious consideration to upgrading with traffic volumes of 200 vehicles per day. They also believe it is reasonable to start planning for the upgrade once traffic reaches 100 vehicles per day.

In some cases, an upgrade might be justified by maintenance savings alone, they say, such as when upgrading to a lightly surfaced road (seal coat). Lightly surfaced roads require a smaller investment than an HMA surface.

Other factors that cannot easily be assigned monetary value may also make it wise to pave a gravel road. benefits include reducing dust, providing a smoother and safer surface, improving vehicle and driver efficiency, redistributing traffic, and potentially increasing tax base. Some benefits directly affect county budgets while others have an indirect effect.

On the flip side, however, they note that after an aggregate road is paved, maintenance activities shift to those required for maintaining a higher level of

service. Increased brush and weed control, traffic services, signage, pavement markings, snow and ice control, and traffic control devices are typically needed for a heightened level of service. Anecdotal evidence suggests that snow and ice removal costs for paved roads are much higher than estimated.

Given these factors, the report advises that local officials consider developing their own cost estimates for gravel road maintenance operations and checking them against their historical data. (In the report, estimates of primary gravel maintenance, grading, and resurfacing over a five-year maintenance cycle averaged \$4,160 per year, an amount greater than the county historical cost results.) In cases where officials are confident of their cost calculations, they may use the estimate in place of the historical costs. Jurisdictions lacking sufficient historical data may estimate future maintenance costs, then compare them to historical data provided in the report. Any analysis must be modified, they added, to reflect individual maintenance or construction costs as well as project timing.

The report (2005-09) may be downloaded at [www.lrrb.org/pdf/200509.pdf](http://www.lrrb.org/pdf/200509.pdf)

### Additional Related Reports

1) ReportP2002-01: Best Practices for *Maintaining and Upgrading Aggregate Roads in Australia and New Zealand*, [www.mnroad.dot.state.mn.us/research/MnROAD\\_Project/MnRoadOnlineReports/P2002-01.pdf](http://www.mnroad.dot.state.mn.us/research/MnROAD_Project/MnRoadOnlineReports/P2002-01.pdf)

2) Transportation Research Record 1819, LVR8-1059: *Minnesota's Experience With Thin Bituminous Treatments for Low-Volume Roads*. [www.mrr.dot.state.mn.us/research/MnROAD\\_Project/MnRoadOnlineReports/Minnesota's\\_Experience\\_With\\_Thin\\_Bituminous\\_Treatments\\_For\\_Low-Volume\\_Roads.pdf](http://www.mrr.dot.state.mn.us/research/MnROAD_Project/MnRoadOnlineReports/Minnesota's_Experience_With_Thin_Bituminous_Treatments_For_Low-Volume_Roads.pdf)

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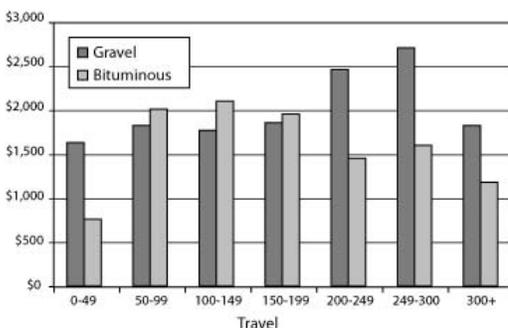


Figure 1: Cumulative maintenance costs for gravel roads increase with traffic volume.



In April, LTAP received a 402 Safety Grant from CDOT to do *Temporary Traffic Control & Flagger Certification* courses for local agencies. The Flagger Certification courses were offered **free-of-charge** to city, town and county employees. Each year, the locations alternate between the north and south half of the state. This year, 5 classes were held at La Junta, Alamosa, Durango, and Montrose (2). Upon completion of the 4-hr training course, participants take CDOT's flagger certification exam. We are proud to announce that out of 92 participants, two individuals received a score of 100% on the flagger certification exam.

### Congratulations!

**David Gray**  
Town of Basalt

**Delmer Vigil**  
Town of Olathe



## PAVEMENT MANAGEMENT SYSTEMS

The Michigan LTAP is conducting a research project titled *Meaningful Use of Local Roads Data*.

One task of this project is to identify Pavement Management Systems (PMSs) currently being used by local agencies throughout the U.S.

The list below has all the PMSs they have found so far that are either commercial or unified, noncommercial efforts.

If your agency is using something that is not on this list,

**PLEASE LET US KNOW.**

### ✕ PMSs:

- . Accela Pavement Mgmt
- . AgileAssets Pave. Mgr
- . ARIA\_BlockviewGIS
- . CenterLine PMS
- . CitiTech Mgmt Software
- . Deighton Total Infra. Management System
- . GeoPlan Roads and Pavement Management
- . GEOSCEMA-ISTreet
- . Hansen PMS
- . ICON PMS
- . Infrastructure Management System (NC)
- . InfraManager
- . IPMP-Iowa Pavement Management Program
- . MicroPAVER
- . Mobility (Washington)
- . Pave Pro Manager
- . PAVEMENTview / Plus
- . PMS 4.0
- . PMS-Georgia
- . PMS Pro
- . RoadManager 2000
- . RoadSoft-GIS (Michigan)
- . RSMS
- . Stantec PMS
- . StreetSaver (California)
- . StreetWise (Washington)
- . TAMS (Utah)

# LTAP Says Goodbye & Good Luck To a Roads Scholar Legend

A few tears may have been shed, but Johan (John) Bemelen says it's time for some world travelling! In January, LTAP received the news that John would be retiring after about 20 years of teaching Road Scholar classes for Colorado LTAP.

For the past several years, John has been the instructor for Colorado LTAP's *Signing, Pavement Markings, and MUTCD* classes as well as the annual *Flagger Certification* workshops. At heart, John is irreplaceable. I feel honored to have had the opportunity to work with him these last 6 years. At the May Advisory Committee meeting, program manager Renée Koller presented John with a plaque/frame/radio thanking him for his many years of service as an LTAP instructor.

John worked for the Colorado Department of Transportation (CDOT) for more than 31 years, with 10 years as their Staff Traffic Engineer. He has served on ITE, AASHTO, and national MUTCD committees, and is recognized as a leader in the traffic engineering field in Colorado and the United States. John is also resigning as an instructor for the American



**“Presented to  
JOHAN BEMELEN  
For Exceptional  
Service as a  
Colorado LTAP  
Instructor  
With Appreciation  
for his  
Dedication to Safety”**

Traffic Safety Services Association (ATSSA), and from the Federal Highway Administration (FHWA).

But don't fret - I may have heard John whisper under his breath that he may be coaxed to come back for a couple of classes after he gets bored of travelling. Yeah - like he'll get bored. Send us a postcard!

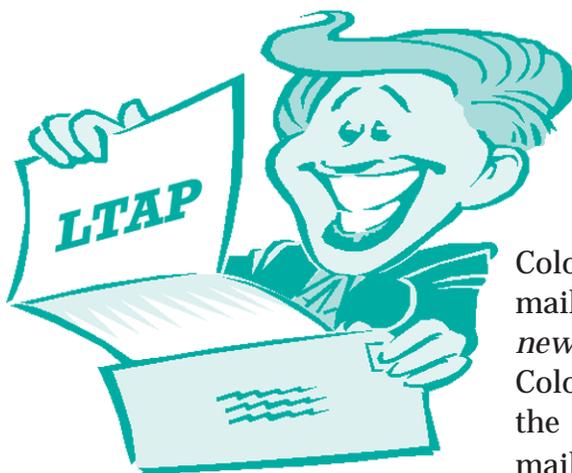
*Goodbye and Good Luck  
We'll Miss You*

## Did You Know?

*Rickshaws* were mainly used in Asia, but nowadays they are outlawed in many places. Rickshaws have been banned in China since the Communist takeover in 1949.



**TRANSPORTATION: OLD VS. NEW**  
*Rickshaws* are a mode of human-powered transport: a runner draws a two-wheeled cart which seats one or two persons. The word "rickshaw" originates from the Japanese *jinrikisha* which literally means "human-powered vehicle." The first rickshaws appeared in Japan around 1868. By 1872, some 40,000 rickshaws were operating in Tokyo. They soon became the chief form of public transportation in Japan. (Wikipedia)



# Mailing List Update

Colorado LTAP maintains a comprehensive mailing list. Our mailing list is divided into two sections: a *brochure* and a *newsletter* mailing list. Each mailing list is used only by the Colorado LTAP center in support of LTAP activities. They're the sole property of the Colorado LTAP center, and neither mailing list is sold or distributed.

**Brochure Mailing List:** Includes the names of the contact people at each agency who receive notification of registration for upcoming training and conferences through class brochures.

**Newsletter Mailing List:** Includes those people who receive our quarterly Newsletter.

In an attempt to keep our mailing list up-to-date, please make any changes, updates, or additions below and return to the Colorado LTAP office.



Mail to: Colorado LTAP, University of Colorado Boulder  
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Fax to: 303-735-2968



Email to: [cltap@colorado.edu](mailto:cltap@colorado.edu)

Changes and additions can also be made online on our website at: <http://ltap.colorado.edu>.



## Brochure Mailings

- Add
- Delete
- Update

## Newsletter Mailings

- Add
- Delete
- Update

Name: \_\_\_\_\_ Agency: \_\_\_\_\_

Job Title: \_\_\_\_\_ Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Email Address: \_\_\_\_\_

**PLEASE COPY THIS FORM FOR OTHERS IN YOUR AGENCY  
~THANK YOU~**

fold



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# What's New in the LIBRARY?

All videos, publications and CDs in the LTAP lending library are available for checkout for a two-week period, free of charge. To check out materials or request a library catalogue, contact the Colorado LTAP office at 1-888-848-5827.

Below is a list of most recent materials added to the library. Our library materials can also be ordered online at: <http://ltap.colorado.edu>

## New DVDs

Location	Title
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DVD50 FWZS	<i>Flagging in the Work Zone - Safety in Your Hands</i>
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This DVD covers proper flagging practices and techniques that help make work zones safer for flaggers, workers and roadway users.

DVD40 PMSS	<i>Preventive Maintenance - Pavement Performance Champions</i>
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The package explains the advantages, benefits, and economics of Pavement Preservation and Slurry System preventive maintenance treatments for existing asphalt roadways. The brochure and videos explain in lay terms, compelling graphs and graphics, the reasons for acceptance and use of these types of surface treatments.

DVD LYNFR	<i>Lifelines, Your National Forest Roads</i>
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This DVD explores the relationship between people and the land as it celebrates the partnership between USDA Forest Service, FHWA, and state and local communities in providing continued stewardship and access to national forests.

## New CDs

Location	Title
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CD GTTC	<i>Guidelines for Temporary Traffic Control (3 CDs)</i>
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These CDs contain the handbook summarizing some guidelines listed in the 2003 Manual on Uniform Traffic Control (MUTCD). It is directed to any entity working on a roadway open to public travel. This handbook contains the basic principles of Temporary Traffic Control (TTC), description of standard TTC devices, and typical application diagrams. Information concerning proper flagging along with the installation and maintenance of TTC devices is also presented.

CD MDM05	<i>Model Drainage Manual 2005</i>
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The manual has been developed to provide the designer with a basic working knowledge of hydrology and hydraulics complete with example problems. All basic design elements are included such that the designer can design highway drainage with minimal assistance. However, this manual cannot provide guidance on complex hydrologic or hydraulic problems, and it is no substitute for experience or engineering judgement.

CD RR	<i>Roadside Reminders</i>
-------	---------------------------

This CD contains a movie of a presentation prepared by FHWA. The presentation provides a strong message on the number of motorists that lose their lives on our highways and emphasizes key areas that safety agencies can focus on to save lives. It makes it clear that just one agency alone cannot accomplish our goal of reducing our nation's fatality rate; it must be a combined effort by many safety agencies that incorporates education, engineering, enforcement, and emergency response.

## New Publications

### Location

### Title

40 CPPM

*Culvert Repair Practices Manual. Volume 1 & 2*

This manual has been developed to provide guidance to highway agencies on procedures that may be used to repair a wide variety of types of problems that beset metal and concrete culverts of all types. Many of the procedures are also applicable to the repair of timber and stone masonry culverts. Procedures are also presented on ways to improve the inlet and outlet ends of culverts as well as streambed channels leading to and from them.

F60 ECH

*Erosion Control Handbook for Local Roads*

A handbook helpful in identifying key issues and concerns of those responsible for controlling erosion on low volume roads. Topics include: The Importance of Erosion Control; Regulation and Permitting; Designing an Erosion Control Plan; Treatment Selection; Erosion & Sediment Control During Construction; Permanent Erosion control; and Erosion Control for Coastal Areas.

22 STT

*Summary of Trenchless Technology for Use with USDA Forest Service Culverts*

Summarizes trenchless technologies most appropriate for USDA Forest Service roadway culvert operations. It emphasizes techniques for replacing or rehabilitating corrugated metal pipe culvert, 18 inches diameter; and covers trenchless technology versus open-cut excavation; pipe inspection; pipe maintenance; pipe rehabilitation; pipe replacement; and new pipe constructions.

### New Videos

### Location

### Title

V40 SPP

*Stormwater Pollution Prevention*

Meet mandatory EPA and state storm water pollution prevention training requirements. Topics covered include: how and why water discharges are regulated, components and goals of prevention plans, management practices to prevent contamination, housekeeping to keep contaminants out of sewers, spill prevention, and clean-up procedures.

V50 LOTO

*Lock-Out/Tag-Out Safety Training for Employees*

This program can help you easily train your employees on proper lockout/tagout procedures, as required by OSHA under 29 CFR Section 1910.147. Focuses on procedures from shutdown to start-up making it easy to combine with your existing training program, or use for retraining as mandated by OSHA.

V50 TSS

*Trenching & Shoring Safety*

Help your employees avoid accidents by teaching them safe excavation-site procedures. This in-depth video focuses on OSHA-regulated safety measures such as protection from hazards with water accumulation, hazardous atmospheres, and design of support, shield underground installations, access and egress exposure to falling loads, stability of adjacent structures, protection from loose rock or soil, inspections design of sloping, and benching systems.



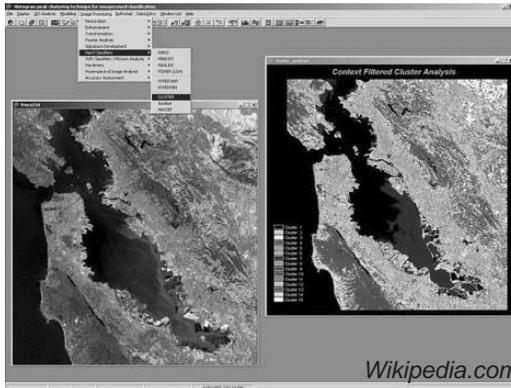
### **NEW: Gravel Roads Maintenance: Meeting the Challenge Toolkit**

The workers who maintain gravel roads are making an important contribution to safety, comfort, and convenience of their communities. Maintaining these roads, however, isn't easy - in fact, it is a tricky combination of art and science that workers must aim to develop. Minnesota LTAP has created the *Gravel Roads Maintenance: Meeting the Challenge* toolkit to teach maintenance workers, supervisors, and engineers the right way to perform gravel road maintenance. The key component of the toolkit is a new DVD video that can serve as a stand-alone tutorial or as an instructor's tool to introduce the topics of gravel road maintenance. Each chapter of the DVD discusses a specific maintenance topic: Correct Roadway Shape, Shaping the Roadway, Good Surface Gravel, and Dust Control. The video can also be used for

presentations to the public to explain what can be done to their local roads, what is being done, and why it needs to be done. Ken Skorseth of the SD LTAP brings many years experience to his narration of the DVD. Safety is always a key theme of his lessons. By making clear how important their jobs are, Skorseth says, the DVD helps workers "take pride in their work on gravel roads." In addition to the DVD, the toolkit includes FHWA's *Gravel Roads Maintenance & Design Manual* and an instructor's guide.

# Geographic Information Systems Free Online Training

**A** geographic information system (GIS) is a system for creating and managing spatial data. It is a computer system capable of integrating, storing, editing, analyzing, and displaying geographically-referenced information. GIS technology can be used for resource management, asset management, development planning, and route planning. For example, a GIS might allow emergency planners to easily calculate emergency response times in the event of a disaster, or a GIS might be used to find wetlands that need protection from pollution. (*Wikipedia.com*)



Wikipedia.com

The Maine Department of Environmental Protection (DEP) offers four *Geographic Information System* (GIS) courses **free** online. All DEP GIS training features real situations and data. Courses are written for DEP users, but in all cases the data can be downloaded and the training completed by non-DEP users on their own computers. There are six other GIS course topics under development. All courses can be found at <http://www.maine.gov/dep/gis/training>

**Courses currently available online include:**

- Introduction to ArcGIS 9 - Basic Concepts (GIS 101 for new users)*
- Intermediate ArcGIS 9 - GIS Data Concepts (more in-depth treatment of different kinds of GIS data.)*
- Intermediate ArcGIS 9 - Editing (everything you need to know to start editing GIS data on your own.)*
- Intermediate ArcGIS 9 - Terrain Analysis (a 3D class which covers ways to use 3D data for monitoring lakes.)*

## GIS AND EMERGENCY MANAGEMENT OPERATIONS

Geographic Information Systems (GIS) have been found to play an important role in rescue and recovery operations following natural disasters and attacks. GIS can help with planning for possibilities, and with situation response scenarios. The importance of GIS in the planning stages is its ability to overlay mapping data with location identifiers for specific objects and factors. These systems are capable of visually demonstrating and creatively manipulating the interrelationships among layers of data for practicing "what-if" scenarios.



## Roadway Work Zone Safety for New Drivers

**T**he FHWA, in partnership with the American Road & Transportation Builders Association, AAA Foundation for Traffic Safety, and the National Safety Council recently completed the *Turning Point Campaign* aimed at increasing the awareness of new drivers to work zone hazards and teaching them to safely negotiate work zone situations.

The project website includes useful information for teens, parents, and educators, as well as a work zone fact section. The campaign was developed to supplement existing driver education programs through incorporation of a motivational video, interactive CD ROM, instructional website, a CD ROM of available resources, and miscellaneous safety promotional items.

Turning Point uses Olympic gymnast Dominique Dawes as a spokesperson to help spread the message of:

- \* Know the work zone signs.
- \* Pay attention to other drivers.
- \* Stay focused. Avoid distractions.
- \* Expect the unexpected.
- \* Keep your cool. Be patient.

Educators will find this comprehensive hub of driver safety information very useful in explaining the importance of work zone safety, as it makes available a variety of teaching tools, such as quizzes, products, and networking tools.

*Turning Point* is a program with one goal in mind—keeping new drivers alive and safe in work zones.

<http://www.workzonedriver.org/>



## Did You Know?

A teen is killed **every three days** in a roadway work zone crash.

Seven teens are injured in work zones **every day.**

[www.workzonedriver.org](http://www.workzonedriver.org)

**Need a little  
extra Cash?**  
Your knowledge  
is worth  
something.



Our center is continuing its program to encourage local participation in the publishing of Colorado LTAP's quarterly newsletter. We would like the recipients of our newsletter to benefit from all the knowledge local agencies have in the areas of roadway maintenance, design, and construction. We are offering **\$50.00** to city, town, or county employees that submit an article that is chosen to be published in our newsletter. Articles can address current methods and procedures, best practices, innovative techniques, or projects in the transportation industry. Content should contain as much detail as possible, but we can provide assistance in editing and writing the final version. We request articles not promote any particular product.

*Photos are encouraged.*  
To submit articles/photos, include author name and contact info, and mail or email to  
**cltap@colorado.edu.**



## Can You Build a Better Mousetrap? "You Show Us" 2006



"You Show Us" 2006

**Calling all Counties  
We want to know your  
innovative ideas!**

*South Dakota's 2005 Regional You Show Us contest winning entry - "The Gravel Saver".*

Colorado LTAP is pleased to announce the 2006 "You Show Us" contest! This is the contest's 12th year. The concept began in 1994 as "You Show Us How".

We are aware that in many instances there are not enough transportation dollars available to maintain our transportation systems to the desired level of service. This is particularly true when it comes to local government transportation programs. The costs for repairs and improvements are increasing while the available finances are decreasing.

**Solving today's problems requires efficient use of existing funds, and the application of cost-reducing & innovative techniques.**

These problems are not easily solved with yesterday's solutions!

What is the best idea you have implemented in your county within the last few years? Past entries have included unique safety and operational efficiency improvements, and time saving designs. Your entry could be related to these areas or many others. This is your opportunity to showcase something that has worked and of which you are proud, and to share this information with your counterparts across the state, and even the nation.

The contest is open to all *county* governments in Colorado. All participating Colorado counties will receive a certificate of participation and their entries will be published in our newsletter. The winning Colorado entry will be submitted to compete with counties in Nebraska, North Dakota, South Dakota, and Wyoming to determine the regional winner.

Entries should be no longer than two typewritten pages and should include:

1. County Information
  - County Name
  - Contact Person
  - Contact Address
2. Problem Statement
3. Discussion of Solution
4. Labor, Equipment, Materials Used
5. Cost
6. Savings/Benefits to the County

~Photographs are encouraged.~



**WIN A TRAVEL  
STIPEND**

Colorado LTAP will sponsor two county employees to represent their state winning project at the 2006 County Road Advisors Conference. The state and regional awards will be presented at the conference, to be held in Rapid City, South Dakota

October 25-26, 2006.

All entries must be received by **August 1, 2006** to be considered. You may mail or e-mail your submission. The state winner will be notified by September 11<sup>th</sup>.

**Mail** entries to:

"You Show Us" Contest  
Colorado LTAP  
University of Colorado  
3100 Marine St., Rm. A-213  
UCB 561  
Boulder, CO 80309-0561

**E-mail** entries to:

cltap@colorado.edu

For additional information call:

Renée Koller or Lindsay Nathaniel at the Colorado LTAP Center, 303-735-3530 or toll-free 1-888-848-5827.

*We look forward to your entry!*

# Road Agency Responsibilities

## Can Change in an Instant

Whether it's a forest fire, hurricane, tornado, or terrorism, here are a few issues to consider in determining if your agency is prepared. Does your agency have an emergency management plan? How does it affect your department? Did any of your traffic operations infrastructure survive? What is your time for recovery? What is the role of transportation operations during the recovery period? What is the role of

your transportation professionals during the transition from disaster site to operational roadways? Is there a component to civil security that transportation fills while an incident is a disaster site? To what extent does your agency aid in evacuation and incident traffic control? Who's responsible for road clearing and hazardous material clean-up from roadways; are they properly trained?



*Kobe Earthquake Memorial Park, Japan.* On Jan 17, 1995, the city of Kobe was struck by a magnitude 7.2 earthquake. The memorial is an area of the Meriken Pier which was hit and has been preserved in its damaged state. It relays the tragedy of the disaster and the city's subsequent restoration. Although the destruction to the port of Kobe was devastating, the entire city was rebuilt in just 2 years!

Photo by *Renée Koller*



*Biloxi, Mississippi, USA.* On Aug 30, 2005, the Louisiana and Mississippi coasts were hit by a category 4 storm with maximum winds at 140 mph. This bridge was no match for Hurricane Katrina. This vital link connecting Biloxi to Pascagoula was swept 30 feet off its pylons and cast into the sea. The bridge remains closed eight months after the storm.

Photo courtesy of *APWA Reporter*, March 06



**Kudos to Colorado Springs!** The El Paso County DOT promoted *Work Zone Safety Awareness Week* with this portable changeable message sign on Marksheffel Road.

### FEMA RELEASES "GETTING READY FOR DISASTER" DVD

With the upcoming hurricane season, killer tornados, wildfires, and floods, FEMA has released a new citizen preparedness DVD titled, **"Getting Ready For Disaster"**.

The DVD guides viewers through important steps of disaster preparedness and is a welcome addition to FEMA's preparedness materials.

The video addresses the following areas:

- \* Introduction
- \* Get Informed
- \* Make a Plan
- \* Disaster Supplies Kit
- \* People with Disabilities
- \* Food and Water
- \* Helping Children Cope
- \* Getting Involved

Video clips can be downloaded online, or a DVD can be ordered from FEMA. For more information visit: [www.fema.gov/areyouready](http://www.fema.gov/areyouready)

Also available is **Are You Ready? An In-depth Guide to Citizen Preparedness**. It is FEMA's most comprehensive source on individual, family, and community preparedness. The guide has been revised, updated, and enhanced to provide the public with the most current and up-to-date disaster preparedness information available.

## FIRST QUARTER ROAD SCHOLAR GRADUATES

**City of Arvada**  
Ron Mahoney  
Dan Pumphrey  
Jim Quintana  
Dewayne Benefiel  
Frank Bargas

**City of Berthoud**  
Jerry Wilson

**City of Brighton**  
Rob Gleim  
Mike Torres  
Hector Huerta  
Dennis Roybal

**City of Broomfield**  
John Beale

**City of Castle Rock**  
Randy Worthington

**City of Dillon**  
Scott O'Brien

**City of Golden**  
David Henkel

**City of Greeley**  
Adrian Yebra

**City of Thornton**  
Carlos Lopez

**Arapahoe County**  
Ray Chandler  
Terry Brawley

**Delta County**  
Larry Record

**Elbert County**  
Rick Manyik

**El Paso County**  
Steve Barden  
Harry Miller  
Dennis Sack  
Paul Wiggs

*continued on next page...*

# Ideas That Work

## Saving Your Agency Time & Money

### Street Smarts

#### A New Vehicle in the Streets Department

##### City of Golden

In the past, the City of Golden's Streets Division has had two separate trucks for marking pavement and for street signage. As a result, the crews had to switch back and forth from one truck to another, wasting time lugging tools to and fro and racking up excess mileage between the two vehicles. At the time, it was the only way to get the job done.

A new, more efficient vehicle has combined all those functions into one, helping crews do their jobs more productively. The new truck replaced an inefficient and messy hydraulic system with a much cleaner pneumatic (air) driver for pounding sign posts into the ground. Sign installation times have been cut in half, which has additionally improved the replacement schedule. The truck also allows crews to choose between three types of pavement painting techniques depending on which application is most appropriate. The possible applications include regular: pavement painting, glued 3M tape, and thermo tape that is melted on the asphalt.

With this one truck, crews have greatly improved efficiency by having all of these options available to them at any time. Drive times have been significantly reduced, as the truck can carry all of the necessary tools for both pavement painting and sign installation, and because the truck can carry multiple large signs on board at a time.

The new vehicle also includes an added function the Streets crews did not previously have. A core driller on the truck allows crews to take asphalt samples that assist them in engineering. Additionally, the new truck is equipped with high LED lighting, which is much safer as it is much more visible.



Eventually, the truck will also be equipped with a laptop so that crews can remotely update GPS and IDs for all of the City's signage in a special program called Cartegraph. The City of Golden has over 6,000 signs that are all logged into this program and tracked, helping crews locate them easily and monitor inventory, maintenance and replacement.

**For more info about Golden's Streets Division, contact:**

Mark Dugan at 303-384-8108 or visit [www.CityofGoldenofgolden.net](http://www.CityofGoldenofgolden.net), click on Departments, and Public Works. Streets Division is listed in left side navigation bar.

**A new vehicle in the Streets Division  
is replacing two old ones  
and making Streets crews more efficient.**

## Upcoming Events

### Upcoming Training

#### 2006 FALL COURSES

NOTE: Our training coordinator is currently finalizing fall dates and locations. Please contact the Colorado LTAP office for an updated schedule, or check online at <http://ltap.colorado.edu>.

#### Road Scholar Core Classes

Drainage

Safety on the Job

#### Road Scholar Electives

Heavy Equipment Training  
Grand County, CO (3-days, \$120)

Easy Methods of Estimating Materials  
for Roadway Projects

Common Sense Solutions to  
Intersection Safety Problems

Small Bridge Inspection

Roadway Safety Fundamentals

### Supervisory Skills Classes

Who's Coming Thru the Door Today?  
Dealing With People

Developing the Leader Within

Successful Employees Make  
Successful Supervisors

Ethics for New Supervisors

### Conferences

CCI 24th Annual Summer Conference  
June 5-7, 2006

Keystone Resort, Summit County  
For registration and information, visit CCI  
online at: <http://www.ccionline.org>

Western Regional Grade-Crossing  
Safety Training Conference

June 5-7, 2006  
Hilton, Vancouver, WA  
For more information, visit their website at:  
[www.techtransfer.berkeley.edu/railroad](http://www.techtransfer.berkeley.edu/railroad)

APWA West Slope Snow & Ice  
Conference

September 6-8, 2006  
Gunnison County Fairgrounds

### FIRST QUARTER ROAD SCHOLAR GRADUATES

...continued

**Mesa County**  
Danny Click  
Danny Spaid  
Brady Sartain  
Terry Nash  
Rudy Bevan  
Dean House

**Otero County**  
Darren Garcia

**Teller County**  
Mike Wilson

**Weld County**  
Ted Eyl

### FIRST QUARTER SUPERVISORY SKILLS GRADUATES

**Weld County**  
Lee Stephen

### ~ Road Scholar 15<sup>th</sup> Anniversary ~

All Road Scholar graduates in 2006 will receive  
a commemorative engraved keychain along with their plaques.



Recent graduates of the *Roads Scholar Program* received their plaques at the *Roadway Safety and Work Zone Traffic Control* class in Colorado Springs. (L-R) Darren Garcia - Otero County and Harry Miller, Dennis Sack, Steve Barden, Paul Wiggs - El Paso County.

### Did You Know?

**Mesa County**  
has the most  
currently employed  
*Road Scholar*  
graduates with 43.

**Garfield County**  
is a close second.

**Keep up the  
good work!**

## NEW FREE PUBLICATIONS

The following is a list of **FREE publications** available to Colorado local government agencies in the transportation field. Quantities are limited and available on a first-come, first-serve basis.

Contact the Colorado LTAP office to put in a request for these free publications.

Check out our website for **additional free materials** not listed here.

<http://ltap.colorado.edu>

### **F40 IJ** *Inspector's Job Guides & Hgwy Maint. Tables*

Need a reminder of what to look for when inspecting curbs, gutters, walks, driveways, plant mix bituminous paving, concrete paving, base courses, culvert pipe or storm sewer installations, grading, seeding or finishing, structures or geotextiles? Need to estimate how many gallons of asphalt will be required per mile of road, how much roadway a 1000-gallon tank will cover, or how many pounds of sand, gravel or crushed stone you have in a stockpile? Answers to these questions and many others (in English units) are at your fingertips in this pocket sized guide.

### **F50 GTTC** *Guidelines for Temporary Traffic Control*

This handbook summarizes guidelines listed in the 2003 MUTCD. It contains the basic principles of Temporary Traffic Control (TTC), description of standard TTC devices, and typical application diagrams. Information concerning proper flagging along with the installation and maintenance of TTC devices is also presented.

### **F50 SIG** *Sign Installation Guide*

A basic pocket guide intended to help new employees or volunteers install road signs. Includes 18 photographs showing the specifications for placing signs along Forest Service roads.

### **F40 APMFG** *Asphalt Pavement Maintenance - Field Guide*

This field guide provides guidelines for preventive asphalt pavement maintenance techniques for a variety of distresses and conditions. It covers: crack treatments (clean/seal, rout/seal, full-depth crack repair); surface treatments (fog seal, seal coat, thin hot-mix overlays); pothole patching and repair (cold-mix, spray injection patching, hot-mix, slurry or microsurfacing).

### **F40 DIG** *Distress Identification Guide*

This publication provides guidance in identifying different forms of distress in the pavement, such as cracking, potholes, surface deformation, surface defects and miscellaneous distress. Colored figures accompany the explanations.



## Colorado LTAP

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