LTAP MATTERS

Montana's **A**nswer **T**o **T**echnical **E**ducation of **R**oads & **S**treets

College of Engineering
Montana State University-Bozeman
Bozeman, MT 59717-3910
(800) 541-6671

January, February, March 2002 **Vol. 20, No. 1**

Governmental Accounting Standards Board Statement No. 34 (GASB 34): Establishing a Value for Infrastructure Assets

By, Tom Maze, Vice President, Howard R. Green Company

One of the most complex issues for agencies attempting to comply with GASB 34 is developing objectives and consistent procedures for estimating monetary values for infrastructure assets (capitalizing assets). Whether an agency chooses to report assets by depreciating their value based on historical costs or using the modified approach outlined in GASB 34 (which applies asset management techniques), ultimately, the agency must include the value of its infrastructure assets in its comprehensive financial reports.

Unfortunately, little research has been conducted to develop standardized methods for capitalizing infrastructure assets. In this article, we provide two possible approaches. The first, relatively simple approach, applies the perpetual inventory method (PIM) to depreciate the value of highway infrastructure assets through time. The second example is taken from work done by the California Department of Transportation (CalTrans) to capitalize bridges. The CalTrans method is based on engineering measurements of the condition of bridges and requires a big management system; such a method would be useful to agencies using GASB 34's modified approach for reporting capital assets.

continued on page 4

On and off the job... LAUGHTER is the BEST MEDICINE

There's no shortage of talk about the impact of stress on our lives, but an often neglected way to prevent and relieve stress is found in Proverbs: "A merry heart doeth like a medicine, but a broken spirit drieth the bones."

The age-old theory that "laughter is the best medicine;" is becoming scientifically intriguing, as evidence mounts that laughter can lower blood pressure, increase blood circulation, and influence the body's immune system in positively wonderful ways.

It is said that "laughter can help you overlook the unattractive, tolerate the unpleasant, cope with the unexpected and smile through the unbearable."

Laughter can make a difficult person a tolerable one, and a frustrating situation something you can deal with.

When we're facing a difficult task, or are trying to beat a deadline, humor can help us get the job done with the least amount of trouble and tension.

Good managers know that using humor with employees encourages them to work better - with more creativity, more energy, and less stress.

***LTAP MATTERS* is published by the Local Technical Assistance Program at Montana State University-Bozeman**

Phone (800) 541-6671 (406) 994-6100
FAX (406) 994-1697
E-Mail (Internet): MTLTAP@coe.montana.edu
www.coe.montana.edu/ltap

Director – Steven Jenkins • StevenJ@coe.montana.edu
Business Manager – Jeralyn Brodowy • jer_b@coe.montana.edu
Accounting Tech/Conference Coordinator – Donnetta Bohrman • dbohrman@coe.montana.edu

2002 Calendar of Events

Winter Travel/Survival	**January 8,** Kalispell, MT **January 9,** Butte, MT **January 10,** Dillon, MT **January 16,** Bozeman, MT **January 17,** Billings, MT
Train the Trainer/Flagging	**February 7,** Helena, MT
Safety Congress	**February 19-21,** Great Falls, MT
IMSA (In conjunction with Safety Congress)	**February 21-22,** Great Falls, MT
Forest Service Training	**March 18-22,** Missoula, MT
Forklift or Loader	**March 18**
Tech Leadership/Winter Survival	**March 19**
Sign Vandalism/WZTC Flagging	**March 20**
Signing and Sign Management	**March 21**
Culvert Placement/Trenching	**March 22**
Work Zone Flagging	**March 26,** Miles City, MT **March 27,** Glendive, MT **March 28,** Billings, MT
MACRS Annual Conference	**April 3-5,** Billings, MT
APWA Spring Meeting	**April 16-18,** Helena, MT
Work Zone Flagging	**April 23,** Great Falls, MT **April 24,** St. Mary's/Park Ent. **April 25,** Kalispell, MT **April 26,** Butte, MT
Equipment Training **Motor Grader** **Loader** **Forklift** **Culvert Design & Installation**	**May,** On Request
Winter Travel/Survival	**On Request**
Leadership for New Commissioners and Technical Supervisors	**On Request**
Work Zone Traffic Control	**On Request**

Depressed?
Exercise can help, too

Many psychologists and psychiatrists are so convinced that regular brisk (aerobic) exercise can help people who are feeling depressed, they routinely recommend it for most of their patients.

The type of mental depression that's helped most by exercise is called "Reactive Depression" - where there is a feeling of sadness that's greater and more prolonged than is warranted by its cause. Symptoms include sadness, boredom, a loss of self-esteem, lethargy, and hopelessness.

Most people find that a daily program of 30 to 60 minutes of brisk walking, jogging, swimming, stair climbing, and/or cycling works wonders to eliminate depression.

Flagger Training
Laborers AGC Training Program

Training Schedule

February 18-19, Pablo, MT
February 20, Kalispell, MT
February 21, Missoula, MT
March 1, Billings, MT
March 11, Helena, MT
March 12, Great Falls, MT
March 14, Butte, MT

Participants must register through Laborers AGC. Call **(406) 442-9964** for registration

GASB 34: Establishing a Value for Infrastructure Assets

continued from front page

FY	Capital Investment During Current Year ($)	(1-0.0202) x Infrastructure Assets at the end of the Prior Year ($)	Estimated Current Infrastructure Assets ($)
1980	1,200,000	100,000,000	101,200,222
1981	2,500,000	99,155,760	101,655,760
1982	3,000,000	99,602,314	102,602,314
1983	1,000,000	100,529,747	101,529,747
1984	500,000	99,478,846	99,978,846
1985	800,000	97,959,273	98,759,273
1986	750,000	96,764,336	97,514,336
1987	850,000	95,544,546	96,394,546
1988	700,000	94,447,377	95,147,377
1989	900,000	93,225,400	94,125,400
1990	2,500,000	92,224,067	94,724,067
1991	2,700,000	92,810,640	95,510,640
1992	2,500,000	93,581,325	96,081,325
1993	2,400,000	94,140,483	96,540,483
1994	2,900,000	94,590,365	97,490,365
1995	2,400,000	95,521,060	97,921,060
1996	2,200,000	95,943,054	98,143,054
1997	2,800,000	96,160,564	98,960,564
1998	2,550,000	96,961,561	99,511,561
Total	35,150,000		

Table 1: Perpetual Inventory Method

Perpetual Inventory Method

The perpetual inventory method, described by Barbara Fraumeni, is a depreciation method for valuing capital stock that can be applied to transportation infrastructure assets. PIM accounts for annual capital expenditures and assumes that existing capital assets depreciate in value at a standard rate every year.

The following equation estimates the total value of infrastructure assets on a year-by-year basis:

$$IA_{year} = CI_{year} + (1-r)\, IA_{(year-1)}$$

where

IA_{year} = Infrastructure Assets$_{year}$ — the value of infrastructure assets in the current year

CI_{year} = Capital Investment$_{year}$ — the amount of capital investment in infrastructure assets in the current year

r = the annual depreciation rate of infrastructure assets

$IA_{(year-1)}$ = Infrastructure Assets$_{(year-1)}$ - the value of infrastructure assets in the year immediately prior to the current year

When using this formula, all capital investments should be expressed in constant dollars so that meaningful comparisons can be made across time. Constant dollars exclude inflation, and express dollars in terms of a base year.

The example in Table 1 uses 1980 as a base year (as does GASB 34) and 100 million dollars as the base value of all transportation infrastructure assets (streets) in a mock Iowa municipality of 50,000 residents (based on Andrew Lemer's study of typical infrastructure investments). Capital investments, expressed in constant dollars, are allocated during each subsequent fiscal year; Barbara Fraumeni's average depreciation rate for transportation infrastructure assets, 0.0202, is used. To simplify, our example, we assume no growth in the highway and street network.

Note that in our example, the lower annual capital outlays in the mid to late 1980's result in a decline in the value of capital stock that continues through the next decade, although the decline is arrested through a large increase in capital spending.

GASB 34: Establishing a Value for Infrastructure Assets

Note also that a total capital investment of over $35 million over 19 years is required to maintain the value of existing infrastructure assets at a level somewhat close to the value of those assets in 1980.

CalTrans' approach to valuing infrastructure
Although employing systems for managing assets, like bridge management systems, will generally fulfill GASB 34's modified approach requirements for reporting capital assets, such systems do not provide a method for capitalizing infrastructure assets. CalTrans uses information from its bridge management system to derive the bridge infrastructure values required by GASB 34.

CalTrans manages its bridge network using Pontis (a bridge management system distributed by the American Association of State Highway and Transportation Officials). With Pontis, bridge inspectors regularly inspect and rate the condition of the various elements in each bridge in their network. CalTrans has developed a formula for converting the condition rating for all the elements in a bridge into an overall dollar value for the bridge.

Typically, using Pontis, inspectors rate each element of a bridge according to five conditions: protected, exposed, attacked, damaged or failed. CalTrans assigns weights, or factors, to these conditions according to their severity, from 1 (protected) to 0 (failed), and determines the cost of failure (replacement cost) for each unit (meter, square meter, etc.) of an element.

CalTrans then uses the following equation to determine the value of each bridge element. The formula incorporates both the severity factor and the unit failure cost:

Current element value =
Quantity in condition state x WF x FC
where
WF = severity weighing factor
FC = failure cost of the element (cost to rehabilitate or replace a unit of an element if it fails)

Note that a condition factor of 0 (failed) will always result in a 0 value for that element.

In Table 2, the formula is applied to determine the current value of each element of a bridge. The values of all elements are summed to calculate an estimated value for the entire bridge. Note that the steel girder has 61 meters rated 1 (protected), 34 meters rated 0.75 (exposed), and 5 meters rated 0.5 (attacked). At a replacement value of $3500

Element	Calculation	Current Element Value ($)
Concrete Deck	300 m2 x 0.5 x $600	90,000
Steel Girder	[(61 m x 1.0) + (34 m x 0.75) + (5 m x0.5)] x $3,500	311,500
Abutment	24 m x 1.0 x $ 9,000	184,400
Column	4 x 1.0 x $ 9,000	36,000
Joint Steel	24 m x 0.0 x $556	0
	Total Current Value of Bridge	622,300

Table 2: Bridge Valuation Calculation

continued on page 6

GASB 34: Establishing a Value for Infrastructure Assets

continued from page 6

per meter, the total current value of the girder is $311,500. To obtain a current, network-level estimate of its bridges, CalTrans adds together the values of all bridges in its network.

Summary

In this article, we have briefly summarized two methods for tracking the value of infrastructure assets. Either method would meet the requirements of GASB 34.

Many engineers and public works directors may view asset management and GASB 34 requirements as merely an academic exercise or as an activity that may be handled by their agency's financial officer. However, we would urge public works professionals and engineers to become engaged in the financial reporting of the value of the infrastructure assets they manage. Valuing assets over time (regardless of the method used) reflects how well infrastructure stewardship responsibilities were performed. Though outcome could have significant implications of future resources allocated to the management of infrastructure.

The perpetual inventory method (as well as other depreciation-based methods) is a fairly simple approach to satisfying GASB 34 requirements. This method, however, provides only very aggregate, policy-level information. CalTrans' method, although a more complex process, clearly provides information that is more useful to infrastructure asset managers and decision makers. The CalTrans example demonstrates that the process of capitalizing transportation infrastructure assets can be based on sound engineering practices, using asset-by-asset condition information to build a value estimate for an agency's transportation infrastructure network.

We urge public works professionals and engineers to become engaged in the financial reporting of the value of the infrastructure assets they manage. Valuing assets over time (regardless of the method used) reflects how well infrastructure stewardship responsibilities were performed. The outcome could have significant implications on future resources allocated to the management of infrastructure.

Laughing in the face of tough times

—adapted from ***Harvard Business Review***

A simple, effective way to keep workers motivated? Laughter. It's possible to make work fun, even in hard times, if you keep these principles of humor in mind.

People are more accepting of humor than you may think. Sure, some people will roll their eyes or cast a cynical eye at your attempts to organize a "fun" activity. But more will welcome the levity, especially when it's a sanctioned part of the company culture.

There's room for humor during tough times. There are times when fun would definitely be inappropriate. For example, you might want to cancel the company winter party if you've just laid off 10 percent of the company work force. But humor can help workers ride out tough times, especially if they see that you can laugh at yourself.

Fun can be part of the routine. If there are required routines that few people really enjoy—like cleaning up workspaces—there's no reason not to inject a little fun into the drudgery. Promise pizza afterward.

Fun can be spontaneous. You can argue that fun ought to be spontaneous, but that can't always be the case in the workplace. Still, if there's an opening to inject some humor, do it.

Fun needs to come from the bosses. You have to set the tone. Laugh at yourself and you'll find that your employees will find you more approachable and that having a good time is OK.

MACRS Agenda

Montana Association of County Road Supervisors Conference
Billings, MT
April 2-5, 2002

Tentative Agenda

Tuesday, April 2, 2002
Registration
Executive Dinner

Wednesday, April 3, 2002
Registration
Commissioner Jim Reno & John Ostlund
Governor
MACO - Legislative Issues
Funding - How it Works
Pavement/Gravel Management - State Wide

Session 1
Plan Reading
Liability - Lack of Signing

Session 2
Insurance - Health
Road Inventory - Center Line GPS
MACRS Social

Thursday, April 4, 2002
Prayer Breakfast
Easement - Road Law
Permitting - FWP, DNRC, DEQ, State Lands
Attitude Doctor

Session 1
Chip Seals - Double Shots, Milling
Liability Issues - Ditching, Crowning

Session 2
CIP - Equipment
Funding Sources - TSEP, FEMA, MDT

Friday, April 5, 2002
MACRS Business Meeting - Election of Officers

Additional Information

- A final agenda will follow with the brochure that will be mailed in early February, 2002.
- Spouses **MUST** register prior to attending the conference. Please include spouses name and contact information when registering.
- Each county is requested to bring a complimentary gift to be given as door prizes.

Dues

Conference Admission is $100.00 per individual. This includes meals and activities.

Vendors will be charged $250.00 each. This includes one conference admission and one vendor table. Additional tables are $20.00 and $100.00 will be charged for any individuals that accompany vendors to work tables.

MACRS Membership Dues

MACRS membership dues are $100. Statements will be going out in the mail the first party of January and will be due back to the LTAP office no later than March 1, 2001. Your MACRS membership entitles you to one conference admission to the MACRS conference in April, PLUS you will be entitled to additional information and benefits throughout the coming year. This will be outlined in more detail in your MACRS membership dues statement.

LTAP Course Descriptions

LTAP assists local governments with understanding new transportation technologies. In addition to workshops, we participate in and sponsor other training events, and offer technical assistance through a variety of partnerships. Here are some of the annual events where we give presentations and training.

Work Zone Flagging
• Combination of lecture, manuals, video and hands-on problem solving. Flagging duties and responsibilities, safety, uniformity and liability issues will be covered.

Work Zone Traffic Control – Level I
• Flagging
• MDT Guidelines Handbook – slide series
• Montana WZ Statistics
• North Carolina Film
• Introduction
• Basics
• 5 Parts
• Montana Standard Maintenance Sheets

Work Zone Supervision – Level II
• One year of 2000 hours
• Typical Applications
• Set-up and Take-Down
• Devices
• Crash Test
• New Standards MUTCD
• Hands On
• TCP-Drawing and Review
• Test including true/false and multiple choice
• Working with Media
• Emergency Personnel

Gravel Road Maintenance
• Cover engineering basics, Road Readin', good surface materials, dust palliatives / base stabilizers, equipment & methods to maintain a good gravel road.

Loader Operations
• Cover basic equipment operation, walk-around inspection, safety, start up and shut down procedures, effective truck loading and stockpile management and modern equipment.

Forklift Operations
• Study of surface conditions, load stability, lifting a load, putting down a load, working with stacks, traveling tips, special hazards and operating safety.

Forklift Fundamentals
• Design of the forklift, parts of a forklift, forklift vs. cars, controls and instruments, pre-use inspection, forklift stability and stability in practice.

Technical Leadership
• For Commissioners, Road Supervisors, City Street Superintendents and other technical leaders This course is designed to help communication, expectations and professionalism. Leaders will learn the difference between leadership and management as shown in the award winning Covey Leadership film, "Max and Max."

Winter Travel/Survival
• Overview of winter travel hazards faced by vehicle and equipment operators. Skills taught will include, simple survival techniques, survival kits, equipment needed, treatment of hypothermia, and preventing carbon monoxide poisoning

Sign Vandalism
• Study of the types of sign vandalism and of the overall effect of sign vandalism from the cost to society to the dangers it presents in every day driving conditions. Also covered are the various state-level programs that have been implemented to combat sign vandalism.

IMSA: Signing, Work Zone, Signalization
• International Municipal Safety Association – provides training and certification for workzone signing, permanent signing and signalization.

continued on page 9

LTAP Course Descriptions

continued from page 8

Welding
• Demonstrate new and traditional welding techniques, give participants hands-on opportunities and discuss safety concerns for welders.

Use of Roto-milling
• A current maintenance practice by MDT is to mill the surface of Interstate roads down to a smooth surface and repave. Counties and Cities have successfully used these milling to surface unpaved roads. The details of preparation, material use and application of rejuvenating agents are discussed.

Winter Maintenance
• Winter road maintenance, when to use salt and sand, anti-icing, winter snow removal operations and winter travel hazards.

Signing & Sign Management
• Signing basics out of the new MUTCD are covered in addition to an introduction of how to keep track of in-place signing. Inventories can be manual or computerized.

Paved & Unpaved Road Management (Paser)
• "How to break pavement network into manageable segments," "How to set up a Pavement Condition Survey," "How to develop a pavement management presentation to a City or County policy board."

Culvert Placement Trenching
• Basic hydraulic design, culvert selection, culvert placement and backfill and maintenance of culverts are all touched on in this class. Safety in and around trenches is also emphasized.

Safety Management
• Design, construction operations and maintenance practices that lead to better safety on rural roads and streets.

Is it Really a Crisis?

by Hazel Shorter, MD

In the final analysis, combating and eliminating stress must begin with the individual gaining perspective.

So many people take themselves so seriously. They think that everything is life-threatening, so they create a crisis environment in which to work - maybe because it makes them feel important, or it makes them feel alive.

After having practiced medicine and dealt with life and death situations for many years, I know what a crisis is, and I know what a crisis is not. And 99.9% of the stuff that goes on in our lives is not a crisis.

At the end of the day put everything back into your desk, lock it up, go home, and forget about it. Believe it or not, it will still be there the next day.

MUTCD Manuals

We have received our MUTCD manuals.
- Bound Manual: $52.50 plus $5.00 shipping
- Chapter Separate: $70.00 plus $5.00 shipping

Please contact Donnetta at the LTAP office to order your manuals today at 406-994-6724.

1st Annual Safety Congress Agenda

Who Should Attend

Those who are involved in permanent or temporary signing would benefit from this course. Sixty (60) agencies throughout Montana will receive a signing package. One representative from each county or larger city who is willing to take the information back to other work associates should attend. These people should have a basic knowledge of signing and work zones or have a desire to learn.

Work Zone Package

Signs

- Road Work Ahead
- Be Prepared to Stop
- Flagger Symbol
- End Road Work
- Right Lane Closed 1/2 Mile
- Land Closure
- One Lane Road Ahead

Chanelizing Devices

- 28' Cones

Sign Supports

- MDT All Terrain-Spring Loaded

Flagger Paddle

Vests

Schedule of Events

Great Falls - Civic Center
2 Park Drive S.
February 19, 2002

- Work Zone Package Training and Certification - 4 hours
  - -Al Goke, MDT
  - -Steve Jenkins, LTAP
  - -Sam Gianfrancisco, LTAP
- Work Zone Flagging Certification - 4 hours
  - -Steve Jenkins, LTAP
  - -Sam Gianfrancisco

February 20, 2002

- Stemple Pass - Speed Zone Investigation - 4 hours
  - -Harry Lauer
  - -Eric Griffin, Lewis & Clark County
- Sign Vandalism - 2 hours
  - -Ken Kailey, Missoula County
  - -Steve Jenkins, LTAP
- Blaine County Bridge; Liability - 2 hours
  - -Steve Jenkins, LTAP
  - -Don Galus, Blaine County

February 21, 2002

- MUTCD; Millennium Edition - 6 hours
  - -Lloyd Rue, FHWA
  - -Steve Jenkins, LTAP
- Basic Signing; Low Volume Roads
  - -Steve Jenkins, LTAP

Work Zone Distribution from 3-5:00 pm daily.
-Steve Jenkins, LTAP
-Sam Gianfrancisco, LTAP

Registration

Pre-registration is required. The cost of attending is $100 which includes lunch on each day. Registration is limited to 1 to 2 people per agency. To register call the LTAP office at (800) 541-6671, (406) 994-6100 or fax (406) 994-1697.

Hotel Information

Below is the suggested lodging for this meeting.

Townhouse Inn
1411 10th Ave. S.
(406) 761-4600

Days Inn
101 14th Ave. S.
(406) 727-6565

Holiday Inn
400 10th Ave. S.
(406) 727-7200

New Videos and Publications

New Publications

P-23 New Mexico Quality Deck Workshop- Plastic Shrinkage Cracking can and should be prevented; Drying Cracking can not be prevented, but can and should be controlled; Structural Cracking can and should be prevented. Specifications and Design Features.

P-205 Highway Design Handbook, For Older Drivers and Pedestrians – Vol. I Guidelines/ Recommendations–Vol. II -The information in this Handbook should be of interest to highway designers, traffic engineers, and highway safety specialists involved in the design and operation of highway facilities.

FHWA-RD-99-167 Deep Mixing Methods as Used in Geotechnical Applications –Vol. III -This report focuses closely on the properties of soils treated by DMM and aspects of quality control, quality assurance and verification.

P-430 Prediction of Chloride Penetration in Concrete -This report presents the results of a study conducted for the Federal Highway Administration to identify or develop a test method to predict the chlorine penetration resistance on concrete in a short time frame.

P-381 Fundamental Properties of Asphalts/ Modified Asphalts –Vol. I & Vol. II - Volume I report presents the results of a comprehensive investigation of physical and organic chemistry, and the chemical reactions of a wide variety of petroleum asphalts. Volume II report presents 10 new test methods developed during a comprehensive study of the physical and organic chemistry of petroleum asphalts.

P-475 (Delete) - Field Guide for Unpaved Rural Roads Refer to P-219 in publication list.

P-856 European Road Lighting Technologies - Information pertaining to European transportation ministries and lighting professionals regarding cutting-edge technologies in highway and roadway lighting systems, including tunnel illumination, sign lighting, and all methods used to design roadway lighting systems.

New Videos

SG-190 Disaster Preparedness (20 minutes)

Request for Videotapes & Publications

The publications and videotapes in the LTAP library are available free or for a nominal charge upon request. Publications and Software marked *Lending Library may be borrowed for several weeks, but must be returned to LTAP. Anyone may borrow up to three videotapes at a time rent-free for two weeks.

You may order any videos or publications by calling toll-free (800) 541-6671. Contact Donnetta Bohrman if you have any questions or concerns.

Local Technical Assistance Program
416 Cobleigh Hall
PO Box 173910
Montana State University-Bozeman
Bozeman, MT 59717-3910

Non-Profit Org.
U.S. Postage
PAID
Permit No. 69
Bozeman, MT
59715

Approximately 2,100 copies of this public document were published at an estimated cost of $.709 per copy, for a total cost of $1,488.80 which includes $1,151.80 for printing and $337 for distribution.

MDT attempts to provide accommodations for any known disability that may interfere with a person participating in any service, program or activity of the Department. Alternative accessible formats of this document will be provided upon request.

Contributions Welcome

LTAP welcomes contributions to LTAP MATTERS. Those wishing to submit relevant material to be published in the next newsletter can submit their ideas/articles to:

Megan Mikkelsen
Local Technical Assistance Program
P.O. Box 173910
Bozeman, MT 59710-3910
Fax: (406) 994-1697
email: mmikkel@coe.montana.edu

The Local Technical Assistance Program Newsletter is published quarterly. Funding for this program is provided by the Federal Highway Administration through the Montana Department of Transportation, Montana State University and a portion of Montana's gas tax revenues. This newsletter is designed to keep you informed about new publications, new techniques and new training opportunities that may be helpful to you and your community. Individuals wishing to receive future copies of the newsletter at no cost may send their request to LTAP, 416 Cobleigh Hall, PO Box 173910 Montana State University-Bozeman, Bozeman, MT 59717-3910, or call 1-800-541-6671.