Ten Essentials of a Good Road

Here are 10 basic tips to help maintain and keep your roads in good condition

1. KEEP WATER AWAY FROM THE ROAD.

   Drainage cannot be overemphasized in road construction and maintenance. Water affects the entire serviceability of a road. Too much water in the base material weakens the road. Water allowed to remain on top of a gravel or black topped road weakens the surface and, combined with traffic, causes potholes and cracking. If improperly channeled, water causes soil erosion and a breakdown of pavement edges. Whether it is mud in the spring or frost heaves in the winter, the presence of water in roads is nothing but trouble.

   A good surface drainage system is the best way to lessen water damage on a road. Proper surface drainage prevents water from infiltrating the pavement surface and removes water from the driving lanes in a constant thin sheet to the side ditches, which carries the water away from the roadway. A surface drainage system has four main components: road crown, shoulders, ditches, and culverts.

   The road crown, or superelevation of the road surface, drains water off the road surface.

   Shoulders are an extension of the road surface and allow for the continued flow of water to the ditches.

   see Ten Essentials on page 4
Connecticut Statewide Bicycle and Pedestrian Plan and Map Update

The Connecticut Department of Transportation is pleased to announce the first newsletter for the Connecticut Statewide Bicycle and Pedestrian Plan and Map Update project is now available on the project’s website www.ctbikepedplan.org.


The Statewide Bicycle and Pedestrian Plan and Map Update process includes evaluating the state’s goals and policies, overall needs, and ideas for bicycle and pedestrian improvements in the state.

The process is expected to last 18 months and include a variety of public and agency involvement efforts as well as additional efforts that are new to bicycle and pedestrian planning in Connecticut.

The process, which began in January 2008, will result in a state Plan and a Map that provides Connecticut residents and visitors with information on bicycle and pedestrian policies, facilities, and needs.

If you have questions or comments please let the project team know by visiting the Contact Us page of the website www.ctbikepedplan.org/contactus.html.

New Signal Timing Manual Ready for Free Download

The FHWA Office of Operations has issued The Signal Timing Manual, the first comprehensive guide to current practices related to traffic signal timing. Properly timed signals save gas by keeping traffic moving smoothly. All the elements of signal timing, from policy and funding considerations to timing plan development, assessment, and maintenance are covered.

The manual is the culmination of research into practices across North America and serves as a reference for a range of practitioners, including traffic engineers, signal technicians, design engineers, teachers, and university students. It is available at www.signaltiming.com.
Connecticut Creative Solutions Award Program

Don’t miss this opportunity to share all those great ideas.

The Connecticut Creative Solutions Award Program was developed by the Technology Transfer Center to recognize the initiative and innovative thinking of public agency transportation staff in the development of tools, equipment modifications, and processes that increase safety, reduce cost, improve efficiency, and improve the quality of transportation. This is the 4th year of our program and our judges are looking forward to reviewing our 2008 Nominees. Visit our website at: www.t2center.uconn.edu/solutionsaward.php to download a nomination form. Remember to include photos of your innovative ideas.

The deadline for submission is September 1, 2008

We have just published the Connecticut Creative Solutions Guide which is a compilation of all of our award winners, we hope you find it to be a value resource. A copy can be downloaded at the creative solutions link mentioned above. We will continue to build the guide by adding each new year’s winners.

If you have any questions about the CCSA program, don’t hesitate to call Mary McCarthy at (860) 486-1384.

Technology Transfer Center Calendar of Events

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For updates on our training programs, visit us at: www.t2center.uconn.edu
Ditches are used to carry water away from the roadway. They need to be kept clean and protected from erosion. Water left in the ditch can sometimes leak back into the base.

Water collected and carried in the ditch has to be directed away from the roadway at frequent intervals, sometimes using culvert pipe.

Culverts usually channel water from one side of the road to the other, helping to control the flow of water and slowing it down to reduce erosion.

Road managers are guided by the principles that water runs downhill, that water needs outlets at the bottom of all grades, and that puddles mean problems.

2. BUILD ON A FIRM FOUNDATION.
A highway wears out from the top, but it falls apart from the bottom. This is another way of saying that the road base determines the service-life of a road. The base supports everything above it, including traffic.

Without adequate support, the road will deteriorate rapidly. A good road requires a suitable foundation composed of stable material. A road material is stable if it has negligible soil settlement with a change in moisture content and does not deform excessively under repeated loads whether the material is wet or dry.

3. USE THE BEST SOILS AVAILABLE.
The supply of natural, good quality soils and aggregates is beginning to disappear. Blended or crushed gravel is a more expensive alternative. The quality of soils used by a road manager often depends on local availability and budget.

In deciding what is available, consider the long-term consequences of using lower quality material. Using inferior base material may require excessive maintenance during the road’s life and, perhaps, expensive rehabilitation. The adage “pay me now or pay me later” applies to road building.

4. COMPACT SOILS WELL.
The more dense the material is, the stronger it is. When soil is improperly compacted, future traffic loads or changes in moisture content can cause settling and failure of the roadway.

Compaction is achieved by pressing soil particles together, which expels some of the air from the mass, making the material more dense. Well-graded soils having a fairly even distribution of particle sizes will compact more easily than poorly graded soils that have mostly one particle size. Crushed or angular particles will compact to a more stable condition than rounded particles of similar size. A certain amount of moisture is necessary for good compaction.

5. DESIGN FOR WINTER MAINTENANCE.
In areas that receive substantial snowfalls, roads that are designed for winter maintenance should be adequate for the rest of the year. Consider the following: if the traveled way is wide enough to allow a snowplow and a school bus to meet, it should be wide enough for the rest of the year.

If ditches and roadside areas are wide enough to store snow, chances are they will accommodate spring thaws and heavy water flows.

Grades should be a minimum of 1% for drainage purposes and should not be greater than 10% if at all possible. If the road is steeper, it is difficult for heavy equipment to maneuver, especially in the wintertime.

Sight distance should be considered in designing a road. For safety’s sake, a driver should be able to see 75 to 100 ft. up the road for every 10 mile per hour driving speed.

6. BUILD FOR TRAFFIC LOADS AND TRAFFIC VOLUMES.
Thin ice on a pond may support a young skater, but it will crack and break apart under the weight of an automobile.

continued on next page
Similarly, a road built to serve residential traffic will break down when it starts carrying a number of large trucks. Road managers know that roads, like bridges, should be designed with the expected traffic type and volume in mind.

A rule of thumb is to design a road to accommodate the largest vehicles that will use the road under normal operation. If in doubt, design the road for the largest piece of equipment that maintains it in all kinds of weather.

Road managers can get information and guidance from their State transportation agencies about the type and thickness of pavement mixes to apply to a gravel road. Generally speaking, a low volume road with some truck traffic may provide good services with a “chip seal” or “sand seal.” As traffic volumes and weights increase, cold-mix asphalt and hot-mix asphalt pavement may be better alternatives.

7. PAVE ONLY ROADS THAT ARE READY.

Some agencies make the mistake of paving over a road that is not properly prepared in their haste to get rid of another dusty gravel road. The result may be a complete waste of money. Paving will not cure the other problems that the gravel road may have. It still must be built of well compacted layers of free draining soil, be able to carry expected traffic loads, and be able to drain well. The cost of rebuilding a mistake is much higher than not making the mistake and doing it right the first time.

8. BUILD FROM THE BOTTOM UP.

A road that has a poor base and poor drainage cannot be adequately improved with a top dressing of gravel or new pavement. It may be necessary, in some cases, to dig out the old road, put in new materials, and build up the road in layers.

Before doing anything to correct a road surface problem, road managers should take into consideration what is causing the problem underneath. Improper drainage, insufficient depth of base, or poor quality gravel may be the culprit. These should be corrected before spending money on the surface.

9. PROTECT YOUR INVESTMENT.

Roads and bridges need regular maintenance to keep them from deteriorating. The increased weight and frequency of traffic on roads, combined with adverse weather conditions, means an increased rate of road and street deterioration. Regular road and bridge maintenance preserves our road investment and prevents costly major rehabilitation later on.

Maintenance activities includes:

Roadway surfaces: blading and shaping, patching, resurfacing; dust control; snow and ice removal.

Drainage: cleaning and repairing culverts and ditches.

Roadside: cutting bushes, trees, and grass; repair and prevention of roadside erosion.

10. KEEP GOOD RECORDS.

Road managers know their roads like the back of their hands. Most of them are walking history books when it comes to the roads they manage every day. This knowledge is of little use, however, when the road manager is ill, moves, or retires. Good record keeping makes roadwork much easier for everybody. It is easier to formulate budgets and to show the citizens a plan for roadwork. Recording which type of work was done on roads or bridges, when, and what materials were used can help a lot in making decisions later on.

Agencies can start by doing an inventory of all roads and bridges, listing length, width, surface types, culverts, problem areas, and other items. Placing these items on a map helps. Next comes listing and prioritizing needed improvements, putting a price tag on them, and taking care of a few problems each year.

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Basics of a Good Road
Test Your Knowledge

ACROSS
1. Compaction of soil is measured as a percent of?
3. Bridges should be washed each spring and cleaned of accumulated dirt and what?
5. Earth cut slopes in clay soils should be constructed on what kind of slope?
6. The percent of grade is determined from the rise or fall of a road in what measurement?
7. When determining the thickness of gravel, what is it based on?

DOWN
2. Desired Pavement widths are determined from anticipated traffic data and considering what?
4. Under ideal conditions, how many vehicles should each traffic lane be able to carry per hour?

Think you’ve got all the answers?
Be the first to fax a correctly completed puzzle to us at (860) 486-2399 and you will receive a surprise gift!

www.crosswordweaver.com
2008 Technology Transfer Expo

September 24, 2008
University of Connecticut
Depot Campus
Storrs, CT

9:00—1:30
Rain or Shine

Come see the latest in technology and services and join public works professionals from across the state for a day of demonstrations, activities and networking.

Call the T2 Center for Tickets (860) 486-5400
www.t2center.uconn.edu

Sponsored by Connecticut Technology Transfer Center and the Connecticut Highway Street Supervisors Association.

Summer 2008 APWA Chapter Update

2008 APWA Congress – The Best Show in Public Works
August 17-20, 2008 – Morial Convention Center, New Orleans, LA

APWA Congress New England Chapter Dinner
August 19, 2008 – Bourbon View Restaurant – New Orleans, LA

August Chapter Board Meeting
August 19, 2008 – Congress Hotel – Kiley Suite – New Orleans, LA

September Chapter Board Meeting
September 17, 2008 – O’Connors Restaurant – Worcester, MA

Fall Mechanics Training
September 25, 2008 – University of Connecticut, Storrs, CT

Carl Quiram, New England APWA Chapter President will be speaking at the National LTAP/TTAP Conference to be held in Colorado in July, 2008. Carl will be joining a distinguished panel of local agencies from all over the United States discussing their role in Disasters/Emergencies.

Details on each meeting and registration forms can be found on the Chapter’s website: newengland.apwa.net
Technology Transfer Center Request Form

Please change my address/contact information as indicated below.
Please add this person to the mailing list. Please remove this person

Name: ______________________________________________________________
Title: _______________________________________________________________
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Phone: __________________ Fax: _________________ E-Mail: ________________
I would like to see a future newsletter article on the topic of: ________________
I would like to suggest the following future training topics be offered by the T2 Center:
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I would like to request the following informational resource materials:
____________________________________________________________________

Please fax a copy of this form to (860) 486-2399 or mail to:

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