HIGHWAY MAINTENANCE AND
ROADSIDE DRAINAGE
CDOT History

- 1909 – The first highway bill was passed by forming a three-member Highway Commission to approve work and allocate funds.
- 1917 – The State Highway Fund was created and the State Highway Department was formed.
- 1968 – The legislation reorganized highway matters and created the Colorado Department of Highways (CDOH) with 3 main divisions: Division of Highways, Division of Planning and Research, and Division of Patrol.
- 1991 – CDOH became CDOT to better align its functions and budgets with Federal Highway Administration and the U.S Department of Transportation.
CDOT is responsible for maintaining a 9,144 mile highway system, including 3,429 bridges with over 28 billion vehicle miles of travel per year. CDOT maintains this with an annual budget of 1.5 Billion dollars.

CDOT's Mission

"To provide the best multi-modal transportation system for Colorado that most effectively moves people, goods, and information."
drainage, drainage, drainage,
drainage, drainage, and drainage.
Problems caused by poor maintenance of your drainage

- rutting, cracking, potholes, erosion, washouts, heaving, flooding, and premature failure of roadway.
Roadside drainage systems can have a major impact on local roadways, drainage and water quality.

The following recommended management practices for highway operations are intended to save you long term costs, improve highway drainage efficiency, and longevity.
Good design saves money:

- Properly designed, constructed and maintained road/stream crossings and roadways will lead to long-term savings by decreasing the amount of repairs and replacements that will be required “down the road.”
Improper Design, or poor maintenance practices will cost you time and money.
BEST MAINTENANCE PRACTICES?
Drainage Maintenance

- Use high quality road materials to promote good drainage.
- Move water off road surfaces as soon as possible.
- Promote good subsurface drainage.
- Make sure that culverts are appropriately sized (the County Soil and Water Conservation District can help with calculating the amount of runoff).
- Use appropriate culvert type, alignment, and end treatments.
- Ditches are important: pay attention to the shape, side slope, fall, lining materials, capacity, and depth.
- Direct runoff into vegetated filter areas or rock-lined turnouts.
- Manage water entering the roadway (use bank benches; look beyond the right-of-way).
- Monitor and maintain all drainage ditches and structures.
Prevent erosion

- Approximately 30 tons of material can be eroded from a mile of ditches before you can see the damage! To remove and replace 30 tons of material is a lot of work.
- Timely re-vegetation of road ditches and banks is the single most effective deterrent to water pollution originating from roads and road ditches.
- Vegetation slows the flow of water, consumes water, encourages infiltration, and anchors the soil.
- Minimize areas of disturbance.
- Avoid concentrating runoff.
- Stabilize ditches and other disturbed areas as soon as possible.
- Keep runoff velocities low.
- Inspect and maintain erosion and sediment control practices.
Stabilize road banks

- To determine a stable slope angle, look at stable slopes nearby that have the same soil and cover.
- Roots of established vegetative cover are “Mother Nature’s rebar.”
- If the bank is stable, don’t fool with it.
- Identify the cause(s) of unstable banks, bank material, slope, hydrology, and vegetation.
- Select appropriate stabilization techniques, utilizing living plants whenever possible.
- Inspect and maintain new stabilization projects.
Proper maintenance and rehabilitation of existing culverts can be much more economical than replacement.

Any ditch work does two undesirable things if not managed and repaired. It exposes soil to erosion. And it may change the depth or shape of the ditch to an undesirable condition.

Inspect culverts and stream crossings every year (at least every two years) and after high flow events.
Conduct ditch maintenance during dry conditions (late summer or early fall is usually best).

When maintaining a ditch, determine if it needs cleaning (removal of small amounts of sediment and vegetation from the bottom) or reshaping (removal of large amounts of material to widen or deepen the ditch). Be sure to do the right maintenance.

Clean or reshape only a section of ditch at a time, leaving intact vegetation in the downhill part of the ditch to capture sediment.

When maintaining a ditch, place erosion protection or seeding every day and before any rain. (Have the erosion material ready before starting the job.)
Unpaved road surfaces require periodic reshaping to re-establish the crown and cross-slope, and incorporate loose stones back into the road surface.

Sweep paved roads and parking lots to remove pollutants.

Clean storm drain systems regularly to reduce the amount of pollutants, trash, and debris in both the storm sewer system and in receiving waters.

Roadside vegetation management should utilize techniques that maintain stabilizing root systems, preserve tree species (which are structurally strong).
WATER, WATER, WATER

Need to take care of all water problems first!

Only then will all other repairs be cost effective!
Questions?