

Concrete Pavement Preservation Webinar 1 – Questions and Answers

The questions submitted during the webinar follow with answers that our speakers have provided.

Additional resources are available at <https://cptechcenter.org/pavement-preservation/>

1. We have had some situations where diamond grinding would increase skid resistance temporarily, but ultimately decrease in the long term. What would cause this?

This is more than likely a pavement that contains soft coarse aggregate that can polish. When you diamond grind, you expose more coarse aggregate particles. Since more coarse aggregate is exposed, the fins and pavement surface may become more prone to polishing which typically decreases friction. Grooving would be the best solution for such a situation.

2. What are the reasons why most DOT's don't manage individual distresses instead of composite indexes as it relates to concrete pavement?

Remember why Carey and Irick developed the serviceability concept. That is, we don't care what engineers think, we need to relate to the consumers. The same can be said upon communicating with executive leadership and the public. Most lay people will not truly understand many of the engineering terms. A composite statistic provides a very convenient communication tool that most management and the public can readily understand. I believe you will see this to continue for a long time in the future. In the beginning, PMS did not have the computer capabilities to do this, so it literally was not possible to do, but today, it is a different story and that is why I am going against the grain a bit to try and make people understand the original concept of PMS. That is, the circle of life diagram. It is not easy to do, but technologically we have the capacity to do this now. It is only a question of investment.

3. What traffic levels and percent of trucks are on Douglas County's concrete pavements?

AND

What was traffic on these roads in Douglas county in ESALs? Traffic levels are important since these urban roads may not have many trucks. MI, Syed Haider, syedwaqa@msu.edu

The ADT for the concrete roadways discussed in the webinar typically ranged from about 12,000 to 38,000 with a low percentage of trucks (<5%). Specific data on traffic counts for Douglas County can be found at <https://apps.douglas.co.us/gis/TrafficCount/>. ESAL counts were not calculated by Douglas County, but traffic data is available on their website.

4. Did Douglas County do any Dowel Bar Retrofit prior to the diamond grinding? Did all the pavements that were ground have load transfer at the joints?

Dowel bar retrofit was not completed on the pavement prior to grinding. The only pavements that had load transfer were the panels that were replaced since dowels were included in the construction of the replacement panels. The inclusion of dowel bar retrofit in the preservation program was evaluated, and the County decided not to include it based on overall cost considerations.

5. Grinding faulted pavement cures the symptoms of the faulting, but doesn't address the cause? So grinding will need to be performed again when faulting returns. Correct?

Yes, that is correct. One of the decisions that should be made in this instance is what is the best value? Is it best to continue grinding periodically to remove faulting or to DBR before grinding and extend the grinding interval? This should be based on the existing deterioration rates and the planned remaining service life.

6. Larry - one of your last slides talked about the various states' performance. Colorado: do you see their specs as leading to higher performance than other states?

I cannot address this question as I have not compared Colorado's specs. The cumulative distribution plots (survival curves) I showed at the end were based on surveys of state's estimates. So, it would be necessary to compare a given state's specs with other states as well as their construction practices and available materials. This has not been done to my knowledge.

7. I believe timely application of preservation is a key factor for the successful pavement preservation program. How can we reduce the lag time between collecting condition and delivering preservation project on time?

I agree completely, but this is very difficult to accomplish because it must be done by management. The first thing is to document what the state's actual lag time is for each of the preservation strategies from a statistical standpoint and not just an average or in general. This documents the problem and provides the basis for change. Discussions with the FHWA may be necessary if it involves federal funds (STIP programs and Stewardship agreements). But it can be done. In my home state, the maintenance people did 140,000 sq yd diamond grinding project with maintenance funds with about a 3 to 4 month window between when the decision was made to do it, and when it was completed. A design-build project also included diamond grinding over an even smaller window. So, based on the pot of money, the existing procedures, and the contracting mechanisms these things can be addressed. The maintenance programs in my state are bidding 3 to 4 year on-demand contracts that can be used for preservation activities. In these cases, you can cut your lag time down to almost nothing. However, they are using the state procurement contracts as opposed to normal construction lettings.

8. What determined the addition of dowel bars as part of the rehabilitation?

The presence of faulting in the existing pavements and desire to prevent future faulting drove the decision to include dowel bars in the panel replacements. Douglas County installs dowel bars in their reconstruction and new construction projects on roadways with similar traffic levels.

9. Has the Design Life for Concrete Roads been adjusted based on roadway treatment applications for snow and ice removal (salt brine, mag, etc.)?

This is a very good question. The answer to that is going to be dependent upon the existing PMS systems and how they work. The materials related distress example you cite is a very good example of why the circle of life concept (i.e. closed loop feedback) is so critical. If winter maintenance operations are shorting the service life of pavements, this should become evident in a viable PMS and should trigger changes in specifications, or maintenance practices.

10. Is the manual that Douglas county uses to classify pavement conditions available somewhere?

AND

Is the Colorado County Pavement Evaluation Report available? PA, Luis Ramirez, lramirez@qespavements.com

Douglas County's Pavement Distress Identification Manual is not published online. We will follow up with you to provide an electronic copy.

11. Two points relative to diamond grinding: 1) watch for grade differential at intersections and 2) curb and curb and gutter limitations (milling width restrictions).

Very good points.

12. Are there any case studies (even limited) regarding pervious concrete pavement management and preservation? It would be ideal if you can recommend field studies related to distress identification and maintenance, and other pavement parameters (structural and hydrological) of in-service pervious concrete pavements.

Good question. I am not aware of any such studies or any PMS that includes pervious concrete. Doesn't mean there isn't any, just not aware of them.

13. When costs per SY are provided.... letting us know what the thickness was, and if dowels were used would help. Just saying.

The panel replacement thickness was 9" and dowels were installed in the replacement panels for the 2013 project, and this approach has continued over the last 7 years. (Refer to slides 19 & 21.) The reconstruction projects have typically been built with 9" doweled concrete pavement.