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September 6, 2001

Mr. Jim Jones, Executive Director
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2813 SW Westport Plaza Drive
Topeka, KS 66614-2539

Dear Mr. Jones:

Subject: Executive Summary

This is a response to your report titled, "Evaluation of Expenditures On Rural Interstate Pavements In Kansas". Since KDOT was not afforded the opportunity to review the report or provide input, the conclusions drawn are not those of the Kansas Department of Transportation. The report therefore should contain the following disclaimer: "The opinions, findings, and conclusions expressed in this publication are those of the authors and not those of the Kansas Department of Transportation". Further, the funding body should be identified and restrictions on reproduction and distribution should be identified. The following comments are specific to parts of the report.

Pg. 1, par. 3: This section makes reference to LCCA input parameters used in KDOTS practice. While this report studies the historical expenditures of interstate pavements it has little value as input to LCCA. Past performance and costs are of little value considering the significant changes that have occurred in both the rigid and flexible paving industries. Both paving industries have instituted QC/QA procedures, new specifications have been developed to obtain better quality of materials, and mix design procedures have been made in recent years that will effect performance. Past performance is not indicative of future performance when material properties and construction processes have changed. The findings of the report can not necessarily be used to make judgements about future performance and therefore at best is information about past practice.

Pg. 2, par. 1: This section uses the I-35 corridor for comparison. There is only one flexible pavement section on I-35 to compare with numerous rigid sections. The result is a skewed picture because the sample size is so small. Fewer samples favor the outcome. So the I-35 corridor is a poor example for comparison. The I-135 corridor included no flexible sections.

Therefore comparisons to other routes in other parts of the state with different conditions in climate, traffic, and soil are not necessarily valid.

Par. 3.: There is reference to lime treated subgrade. Including lime in the rigid pavements biases the results. Lime was used to prevent differential swell. Prior to about 1970, when petroleum products where relatively inexpensive, it was KDOT's position to accept differential swell in flexible pavements because the undulations in the pavement could be fixed by an inexpensive overlay. After the energy crisis of the 70's KDOT could no longer afford to practice that position. Therefore KDOT began to treat the subgrade for flexible pavements well after the flexible interstate pavements were constructed.

Pg. 5, par 2: This section describes the actions KDOT typically performs on the HMA sections on I-70. The typical rehabilitation noted in the report is not a 10 or 20 year rehabilitation or reconstruction strategy. This practice was adopted in a time when the agency had limited funds and something needed to be done to the flexible pavements on the interstate. The flexible sections of the interstate system where not included in any planned highway program. The actions performed on the flexible interstate sections where completed under interstate set aside discretionary funding. These pavements did not go through a formal evaluation process for structural and geometric deficiencies. Whereas the rigid pavements were included in a construction program and were subject to evaluations for structural and geometric deficiencies. These evaluations ruled out strategies similar to those practiced with flexible pavements.

Pg. 7, par. 1: This section discusses discount and inflation rates. The first two sentences are true statements regarding discount rate, and according to many economic analysis procedures is the correct way to evaluate an investment. The reference to a 2% inflation rate has no bearing on any analysis KDOT has ever performed with regard to LCCA. The past and present highway programs have established inflation rates over the life of those programs. The LCCA performed by KDOT used those rates and the sale of highway bond rates to calculate the discount rate. Review by the FHWA of local conditions has found this to be an acceptable method along with the discount rate of 2%. (E-mail from Kirk Fredrichs 8/3/01).

Pg.13, par. 2: This section discusses the amount of PCCP that is currently in service on I-35. The low percent of rigid pavements in service on I-35 is not a function of pavement type but an agency policy regarding geometric conditions we find acceptable or unacceptable. The evaluation of all rigid pavements has been subjected to the standards set for the Major Modification program. Only two sections of flexible pavement have gone through that process. Only one of those sections has been let to contract and the action for it was similar to that for rigid pavements. Geometric constraints such as overhead structure clearance, shoulder width, shoulder and side slopes have caused us to reconstruct rather than purchase ROW and resurface or rehabilitate the rigid pavements. Because rigid pavements have been subjected to this process they are unfairly subjected to increased costs.

Pg. 17, Fig 6: The subject is the graph showing time and cost of expenditures for PCCP on I-70. The data in Table C-10, 11, and 13 in the "Final Report" do not support the graphs on Figure 6 of the "Executive Summary". The first action shown for Dickinson county was spot mudjacking at a cost of $16K. Mudjacking hardly constitutes an action. Further the action

occurred at year 7 and not 2. The action at year 2 was a bituminous shoulder seal. The first action on this pavement was at year 20. The same tables show that the first action in Wabauness County occurred at year 22 and not year 3. A bituminous shoulder seal was placed at year 8.

Pg. 22, par. 1: The section discusses annual expenditures of HMA and PCC pavements. The annual expenditure for rigid pavement after 20 years is due to reconstruction, the policy KDOT chose. That policy was based on ROW and geometric issues rather than pavement condition. Because KDOT chose to do reconstruction the conclusion in paragraph 2 can not be supported.

Pg. 23, par. 4: The section discusses the time to a maintenance action. The data from Table C doesn't support the statement that rigid pavement had an action after 10 years while only 20% of the flexible pavement had an action. The data shows that the average life to first action on flexible pavement is 8 years and the life to first action on rigid pavement is 18 years. Based on the data in Table C, Figure 11 on page 25 should be reconstructed to exclude spot mudjacking and bituminous seals on the asphalt shoulders as actions for rigid pavements. The statement on pg. 26, par. 1 is inaccurate. The average age to first maintenance, excluding the first overlay is 8.5 years. The first actions were primarily slurry seals.

Pg. 26, par. 3: This section discusses the time to first overlay and excludes the stage construction in the time line. The time to first overlay should include the stage construction. The stage construction concept was chosen for two reasons. KDOT knew that after 10 years some action would be needed on flexible pavements to address aging and problems from initial construction. Stage construction was also used as a funding mechanism. In the early part of the interstate funding program no federal funds could be used on resurfacing, rehabilitation, or restoration. By including a stage construction KDOT was able to get federal funding to perform the needed repairs/resurfacing to the flexible pavements when needed at 10 years. Had KDOT not been able to do this KDOT would have included the stage construction pavement section in the initial design. This would have increased the cost of the flexible pavements even more during the first 10 year period. If KDOT had constructed the full stage for the flexible pavements initially, the 2001 costs for initial construction would be 71% higher.

Pg. 26, Conclusions: This states that HMA costs less than PCC pavements. The second (2) conclusion is not necessarily true. Equivalent pavement sections were not constructed. The assumption that the pavement sections are equivalent is not valid. The pavements were constructed under different environmental, traffic, and soil conditions. These factors determine the pavement structure.

Pg. 28, This section makes recommendations based on data and discussions in the report. Recommendations: HMA Pavements - KDOT constructed the first overlay at 8 years. Therefore our practice of including overlays in our LCCA is justified. By year 25 KDOT had resurfaced and recycled all of the HMA sections. The rehabilitation for thermal cracks occurred prior to or at the time of the first recycle. On the average the first recycle occurred at year 25 for the purpose of addressing thermal cracks and not at 35 years as stated in the report.

Recommendations: PCC Pavements - Data from Table C show the life to first action is18.6 years and not 10 - 12 years as suggested in the report. The service life shown until

reconstruction results from KDOT practice regarding geometric conditions and not pavement conditions. If KDOT changed its practice regarding geometric constraints rehabilitation actions could extend the service life of these pavements.

In general the conclusions drawn and recommendations made in the report are not supported by the data. Therefore, KDOT will not change its surface type selection practice based on this report.

Sincerely,

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Assistant Secretary and
State Transportation Engineer

AJG:ag
cc: Steve Woolington
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