Approved: March 19, 2002
Date

MINUTES OF THE HOUSE TRANSPORTATION.

The meeting was called to order by Chairperson Gary Hayzlett at 1:40 p.m. on March 13 , 2002 in Room 519-S of the Capitol.

All members were present except:

Committee staff present:
Bruce Kinzie, Office of the Revisor
Hank Avila, Legislative Research Department
Ellie Luthye, Committee Secretary

Conferees appearing before the committee:
Sheila Walker, Director, Division of Vehicles
John Petersen, Attorney for KCERC
Larry O'Donell, Asphalt contractor
Don Popejoy, Kansas Asphalt Pavement Association
Butch Spray, Venture Corporation, Great Bend, Kansas
Tom Ritchie, CEO Ritchie Companies, Inc., Wichita, Kansas

Others attending:
See attached list

SB 506 - educational license plates, definitions

Chairman Hayzlett opened hearings on **SB 506**. Sheila Walker, Director of Vehicles, said this bill, as introduced, would codify that municipal universities and accredited, not-for-profit institutions of higher learning, are eligible to make application for educational institution distinctive license plates. Additionally, **SB 506** waives the $.50 reflectorized plate fee for distinctive plates that are issued at no charge to the recipient. The current statute unintentionally excluded not-for-profit institutions of higher learning and municipal universities. She concluded this bill would make the provision of school plates accessible to all colleges on an equal basis. (Attachment 1)

There were no other proponents and no opponents. Following discussion Chairman Hayzlett closed hearings on **SB 506.**

There being no objections, Chairman Hayzlett opened **SB 506** for discussion and final action. Representative Levinson made a motion to include a license plate for motorcycles for recipients of the purple heart medal given by the United States government for wounds received in military or naval combat to become effective on January 1, 2003. This was seconded by Representative Osborne and the motion carried.

Representative Powell made a motion to include the "United We Stand" license plate, to become effective on January 1, 2003. This was seconded by Representative Levinson and the motion carried.

Representative Levinson made a motion to include the Masonic Grande Lodge of Kansas license plate, seconded by Representative Vickery and the motion carried. This will take effect on January 1, 2003.

Representative Loganbill made a motion to include a breast cancer logo plate, with the proceeds to go to the Secretary of Health and environment for breast and cervical cancer program and detection fund. This was seconded by Representative Pauls and the motion carried. This will take effect on January 1, 2003.

Following discussion Representative Larkin made a motion to pass **SB 506** favorably, as amended, seconded by Representative Vickery.

Representative Powers made a motion to table the bill. This motion did not prevail for lack of a second.

A vote was taken on the original motion to pass **SB 506**, as amended, and the motion carried.

MINUTES OF THE HOUSE TRANSPORTATION COMMITTEE, Room 519-S of the Capitol at 1:40 p.m. on March 13, 2002.

Briefing on KDOT paving recommendations - asphalt vs concrete

Chairman Hayzlett called on John Petersen, Attorney for KCERC (Kansas for Cost Efficient Roadway Construction) as the first presenter. He said KCERC is a Kansas Corporation that monitors and advocates concerns important to the asphalt paving industry in Kansas. He stated there is no specific legislation that has been introduced to deal with these concerns but they would like for the Legislature to review KDOT'S procedures concerning their paving recommendations. He told the committee that Kansas needs to find ways to spend money more efficiently on transportation and utilizing more asphalt on Kansas roadways would accomplish this goal. He then presented graphs showing the cost of using asphalt versus concrete. (Attachment 2)

Larry O'Donnell said, as an owner of a heavy highway paving construction company in Johnson County, he was gravely concerned about the future of the 1999 Kansas Comprehensive Transportation Plan. He told the committee there were two issues he wished to discuss. 1) The first issue was the Life Cycle Cost Analysis used by KDOT to determine pavement types. He said KDOT uses the analysis approved by AASHTO, however, this is a re-write of the original 1956 AASHTO program and is out of date. 2) The second issue was KDOT'S life cycles does not give credit for the new technology in asphalt pavement construction, which is superpave. He concluded these decisions are costing the taxpayers of Kansas hundreds of millions of dollars and they are not fair to the taxpayers of Kansas. (Attachment 3)

Don Popejoy presented a copy of a study done by Prof. Stephen A. Cross and Prof. Robert L. Parsons, of the University of Kansas, entitled *Evaluation of Expenditures On Rural Interstate Pavements in Kansas* and explained the findings. He said when applying historical data to analyze the two alternate pavement types, two conclusions become obvious: 1) hot mix asphalt pavements cost significantly much less initially and 2) hot mix asphalt pavements have demonstrated significantly lower costs over the entire term of the pavement life than have the Portland Cement Concrete pavements. (Attachment 4)

Butch Spray said the 1989 Comprehensive Highway Program was completed on time and within budget. The 1999 program, with reduced funding and cost overruns is in serious trouble which he said was the beginning of a broken promise to the people of Kansas. He then cited several reasons for this problem. (Attachment 5)

Tom Ritchie told the committee he had two concerns 1) the funding of the 1999 program in this time of economic downturn and 2) what he believes is an extremely poor use of available highway funds themselves because of an unwise pavement surfacing selection process that has been adopted by KDOT in recent years. (Attachment 6)

The gentlemen then stood for questions from the committee.

Chairman Hayzlett adjourned the meeting at 3:25 p.m. The next meeting of the House Transportation Committee will be Thursday, March 14, 2002 in Room 519-S of the Capitol.

HOUSE TRANSPORTATION COMMITTEE GUEST LIST

DATE: March 13, 2002

NAME	REPRESENTING
Jim Jones	Kansas Asphalt Pavement Assoc.
Don Popejoy	Kansas Asphalt Pavement Assoc.
Larry O'Donnell	Kansans for Cost Eff. Rd Const Co. Inc
John D. Peterson	" " " "
Dellie Albert	KDOR - DMV
Sheila Walker	" "

STATE OF KANSAS
Bill Graves, Governor

DEPARTMENT OF REVENUE
Stephen S. Richards, Secretary

Sheila J. Walker, Director
Division of Vehicles
915 SW Harrison St.
Topeka, KS 66626-0001

(785) 296-3601
FAX (785) 291-3755
Hearing Impaired TTY (785) 296-3909
Internet Address: www.ksrevenue.org/dmv

Division of Vehicles

TESTIMONY

TO: Gary Hayzlett, Chairman
Members of the House Transportation Committee

FROM: Sheila J. Walker, Director of Vehicles Sheila J. Walker

DATE: March 13, 2002

SUBJECT: Senate Bill 506 – Cleanup Measure

Mr. Chairman, members of the Committee, I am Sheila Walker, Director of the Kansas Division of Vehicles. I want to thank you for the opportunity to appear today in support of Senate Bill 506.

Senate Bill 506, as introduced, will codify that municipal universities and accredited, not-for-profit institutions of higher learning, are eligible to make application for educational institution distinctive license plates. Additionally, SB 506 waives the $.50 reflectorized plate fee for distinctive plates that are issued at no charge to the recipient.

The statute currently allows applications from schools regulated by the State Board of Regents, community colleges, and Haskell Indian College. The law unintentionally excluded not-for-profit institutions of higher learning and municipal universities. Educational institution distinctive license plates have been well received by numerous colleges. Currently, distinctive plates are being made for four universities in Kansas (Kansas State, KU, Pittsburg State and Wichita State), and several others have made application (Fort Hayes State and Baker). SB 506 will make the provision of school plates accessible to other colleges on an equal basis. Initial screen print set up charges must still be born by the university, and the law requires that an initial order of 500 plates be secured, prior to making any order for plates.

SB 506 also waives the $.50 reflectorized plate fee for those plates that are designated by statute as "free" to qualified recipients. Those plates include disabled veteran (K.S.A. 8-161), and disabled citizens' organization, (K.S.A. 8-161(b)), as well as prisoner of war (K.S.A. 8-177(c)), and congressional medal of honor (K.S.A. 8-1,145) plates.

By passing this bill, the state would discontinue the collection of the $.50 reflectorized plate fee on these four plates only. The fiscal impact to waive this fee on these plates would be minimal.

Thank you for the opportunity to appear before you today. We appreciate your favorable consideration.

House Transportation Committee
March 13, 2002
Attachment 1

Polsinelli | Shalton | Welte

A Professional Corporation

Memorandum

TO: HOUSE TRANSPORTATION COMMITTEE

FROM: JOHN D. PETERSEN

RE: KANSAS DEPARTMENT OF TRANSPORTATION PAVEMENT SURFACING RECOMMENDATIONS
PSW FILE NO: 27707/56833

DATE: MARCH 13, 2002

Mr. Chairman Hayzlett, Members of the Committee:

My name is John Petersen and I represent Kansans for Cost Efficient Road Construction, Inc. ("KCERC"). KCERC is a Kansas corporation that monitors and advocates concerns important to the asphalt paving industry in Kansas. KCERC asks that this Committee review the Kansas Department of Transportation's (KDOT) Pavement Surfacing Recommendations on Kansas highways and review the method used in pavement surfacing Life Cycle Cost Analysis.

Although there is no specific legislation that has been introduced to deal with these concerns, my clients would like for the Legislature to review KDOT's procedures concerning the matter.

Also, testifying with me today will be Larry O'Donnell, to testify on KDOT's use of an outdated Life Cycle Cost Analysis; Don Popejoy, to discuss comparisons between asphalt and concrete pavement selection and Life Cycle Cost Analysis; Orville "Butch" Spray, to testify on the difficulty in completing the 1999 Comprehensive Transportation Program if concrete surfacing is predominately used; Tom Ritchie, to testify on the savings resulting from asphalt use. In support of our concerns, we ask that you please accept the attached issue outline and position paper.

Respectfully submitted,

John D. Petersen

JDP:csh
Attachment

6201 College Blvd., Suite 500
Overland Park, KS 66211
Telephone: (913) 451-8788
Fax: (913) 451-6205

I. Kansas needs to find ways to spend money more efficiently on transportation. Utilizing more asphalt on Kansas roadways would accomplish this goal.

A. Difficult Economic Times call for spending reevaluations. The legislature must work to find a way to efficiently spend transportation dollars.

Obviously we are facing budget realities that are forcing the Kansas legislature to make tough decisions. When those decisions affect transportation spending, you are not just cutting spending, you are eliminating roads, bridges and improvements to dangerous roadways. By using a more cost-efficient means of construction, more road projects can be built at less total cost to the state.

B. Utilizing more asphalt than concrete will give the State greater budget flexibility today and save the State money in the years to come.

Choosing asphalt over concrete will allow the state to continue to improve Kansas highways even while the state faces a difficult budget situation. According to the per-kilometer costs presented in the KDOT pavement selections for 2000 – 2004, the initial cost of using asphalt as a surfacing material is approximately 50% less expensive per kilometer than using concrete. In addition, these initial savings obviously increase in the long-term when one considers the time value of money.

According to an analysis of the KDOT list of 2000-2004 highway projects, even by just surfacing the ten "Undetermined" 2003 – 2004 projects with asphalt, the state can save approximately $130 million over the costs of surfacing these same projects with concrete. (See Exhibit B of the attached Position Paper.) By selecting asphalt for these undetermined projects, it is not too late to effect a real change in the state budget situation. However, it has came to our attention that KDOT has recently recommended concrete as the preferred surface for the projects on the Highway 69 corridor, which make up the majority of the "undetermined" projects. This recommendation will cost the state approximately an extra $51 million over asphalt on just these projects alone. In these difficult economic times, the State owes a duty to reevaluate KDOT spending decisions.

II. While choosing the more expensive concrete surfacing option, KDOT has not followed its own engineering advice regarding surfacing selection on specific highway projects. The highway 169 improvements in Miami County were recommended to be asphalt-surfaced in a letter from a KDOT engineer, yet KDOT chose to use concrete surfacing.

A. Using Asphalt on the Highway 169 project would have saved the state approximately $15,000,000 in up front costs alone.

On the Highway 169 Improvements in Miami County, KDOT compared the use of concrete versus the use of asphalt as a surfacing material. In the attached letter from a KDOT assistant geotechnical engineer, it was noted the costs of using asphalt instead of concrete would save the state $14,810,000 on this project alone. (The letter is attached as Exhibit C of the attached Position Paper.) This figure stemmed from the lower initial costs of asphalt. The letter notes that asphalt can be "considered to have the lowest cycle cost, also." The lower Life Cycle Costs of asphalt will be addressed by the representatives of KCERC attending the hearing with me today.

B. Because Highway 169 was already surfaced with asphalt, the reconstruction with concrete would have caused construction difficulties and delays.

Due to the existing asphalt roadway on Highway 169, the engineer reviewing the project recommended asphalt for the new surfacing, stating that asphalt rehabilitation "should cause fewer problems in the bidding process and in the execution of the work" than the total reconstruction that would occur with the concrete alternative. In addition, the letter noted that rehabilitation of the existing asphalt lanes, rather than complete reconstruction with concrete, would take less time and lessen the exposure time of the public to head-on traffic. Indeed, other important concerns than money often favor the use of asphalt. These concerns have been largely ignored by KDOT in its favoring of the concrete surfacing option.

C. KDOT's spending trends have exposed an unjustified bias toward using concrete surfacing materials.

The letter noted the KDOT bias toward concrete, stating "This recommendation will be very unpopular in many parts of KDOT, however until we as an agency deem one material superior to another, we need to be fiscally responsible in selecting surfacing alternates." The letter clearly states what has been shown to be true: that KDOT has a bias toward using concrete surfacing. We feel this bias exists based on a flawed method of evaluating the total costs of each surfacing option. I have brought with me today representatives of the KCERC Coalition to explain KDOT's failed methods of evaluating paving materials.

Position Paper on Asphalt vs. Concrete Surfacing on Kansas Highways

1. The Asphalt Industry Workload is Down Substantially, with the Majority of Highway Dollars shifting to Fund Concrete Surfacing Projects.

In the 1990s, there was a roughly 70/30 split between asphalt (70%) and concrete (30%) projects, based on KDOT spending for the two surfacing options. This has reversed dramatically since 2000, with only approximately 30% of KDOT spending going to asphalt-surfaced projects and 70% going to concrete-surfaced projects. This decrease of the asphalt workload is costing Kansans to spend more tax dollars for less miles of highway improvements, as well as seriously threatening the Kansas asphalt industry.

2. Asphalt is 50% Less Expensive than Concrete in Up-front Costs.

According to the per-kilometer costs presented in the KDOT document detailing pavement selections for 2000 – 2004, the initial cost of using asphalt as a surfacing material is approximately 50% less expensive per kilometer than using concrete. An analysis of the pavements used in KDOT projects from 2000 – 2004 indicates that asphalt costs approximately $750,000/km, while concrete costs $1.5 million/km, meaning that asphalt averages about half the cost of concrete. Using asphalt saves significant initial costs and it also generates long term savings when one considers the time-value of money.

3. Utilizing More Asphalt will Give the State Greater Budget Flexibility Today and Save the Comprehensive Transportation Plan (CTP) in the Years to Come.

Choosing asphalt over concrete will allow the state to continue to improve Kansas highways even while the state faces a difficult budget situation. According to an analysis of the KDOT list of 2000-2004 highway projects, changing just two years' (2002 & 2003) projects from concrete to asphalt would result in over $150 million in savings. (See Exhibit A.)

Even by just surfacing the ten "Undetermined" KDOT 2003 – 2004 projects with asphalt, the state can save approximately $130 million over the costs of surfacing these same projects with concrete. (See Exhibit B.) (Based on the average cost per kilometer of the two surfacing options presented on the 2000-2004 KDOT project list.) By selecting asphalt for these undetermined projects, it is not too late to effect a real change in the state budget situation. However, it has came to our attention that KDOT has recently recommended concrete as the preferred surface for the projects on the Highway 69 corridor, which make up the majority of the "undetermined" projects. This recommendation will cost the state approximately an extra $51 million over asphalt on just these projects alone.

The long term viability of the Comprehensive Transportation Plan (CTP) is threatened by the trend to use more concrete. Under the present cost distribution of projects (roughly 30% asphalt to 70% concrete), the CTP will incur a deficit after fiscal year 2007. A change in surface selection returning to a division of roughly 70% asphalt and 30% concrete would reduce the cost of the remaining CTP projects by approximately $210-280 million, while maintaining traditional concrete market share. This figure alone is likely enough to secure the successful completion of the CTP.

4. The State is Using a Flawed Life Cycle Cost Analysis that Under-represents the Long Term Costs of Concrete Surfacing.

Some Representatives of KDOT have suggested that any initial savings obtained by utilizing asphalt instead of concrete are off-set when long-term maintenance and or replacement costs are considered. First it should be noted, that this conclusion is not universally supported within the ranks of KDOT. Secondly, those that have reached this conclusion do so by utilizing a "Life Cycle Cost Analysis" that is flawed and contrary to the approach recommended by the Federal Highway Administration (FHWA).

Concrete has a 35-year life span. At the end of that 35 years, a concrete road must be completely rebuilt at a substantial cost. In comparison, asphalt needs only rehabilitation at 10 year intervals at significantly lower costs. In order to consider the 35-year life span of concrete, the Federal Highway Administration recommends using a 40-year life cycle cost analysis period. FHWA Publication No. FHWA-SA-98-079. In addition, Keith D. Herbold, PE (Midwestern Resource Center Pavement Engineer with the FHWA) has stated that in no case should a life cycle cost analysis run less than 35 years. Contrary to the FHWA recommendations, the State uses a 30-year life cycle cost analysis to evaluate the long-term costs of the surfacing materials. This results in skewed life cycle cost analysis that greatly benefits the concrete surfacing option.

Using a 40-year life cycle cost analysis, concrete is 38% more than the comparable cost of asphalt. (See chart below.) Even though the asphalt would need to have its surface rehabilitated every 10 years, this is still less expensive that completely removing the concrete road and reconstructing it at 35 years. Unlike asphalt, there is no inexpensive method for rehabilitating concrete when it reaches the end of its service life.

Five Sample Projects	Asphalt Initial Cost	Concrete Initial Cost	40-year Asphalt costs	40-year Concrete costs	40-year Savings Using Asphalt
Interstate 70 (I-70-99K6357-01)	$14,500,000	$17,900,000	$17,267,700	$23,736,114	$6,468,414
Highway 50 (50-28 K 6374-01)	11,294,000	13,813,000	13,454,115	17,297,568	$3,843,453
Highway 50 (50-57 K 6777-01)	6,900,000	8,000,000	9,291,833	13,757,678	$4,465,845
Highway 77 (77-57 K 7417-01)	3,960,000	4,740,000	5,343,785	7,757,148	$2,413,363
Highway 56 (56-57 K 5745-01)	3,044,285	3,306,332	4,387,232	6,202,489	$1,815,257
Total	$39,698,285	$47,759,332	$49,744,665	$68,750,997	$19,006,332
Average	$7,939,657	$9,551,866	$9,948,933	$13,750,199	$ 3,801,266
			Assumes 4% discount rate		

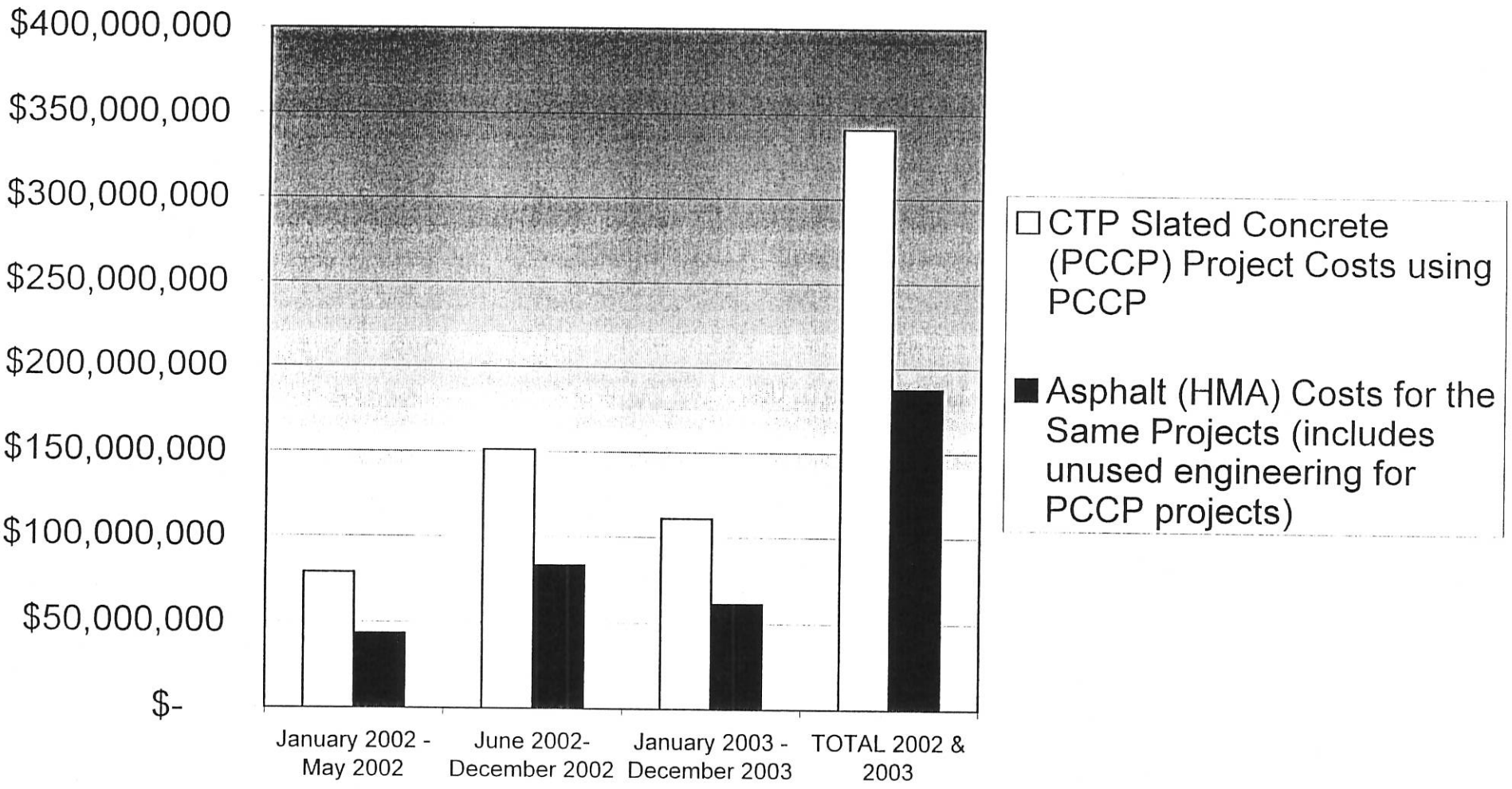
5. A Study Evaluating Expenditures on Rural Interstate Pavements in Kansas has Concluded that Asphalt Surfacing is Significantly Less Expensive vs. Concrete Surfacing.

Professors Stephen Cross and Robert Parsons of the University of Kansas authored a 2001 study titled "Evaluation of Expenditures on Rural Interstate Pavements in Kansas" that focused on historical performance and cost data relating to the two surfacing options. The study involved the evaluation of rural interstate pavements on sections of I-35, I-135 and I-70 that are administered by KDOT. The study concluded that for the roadways evaluated, total expenditures in actual dollars and 2001 dollars were less for asphalt pavements than concrete pavements. In addition, the study found that, due to the high rehabilitation costs of concrete surfaced highways, a period of 135 years would have to pass for the surfacing options to equalize in cost. Until 135 years have passed, asphalt is the less expensive surfacing option.

6. KDOT's Engineering Staff Agrees that Asphalt Surfacing Results in both Lower Initial and Long-term Costs than Concrete Surfacing.

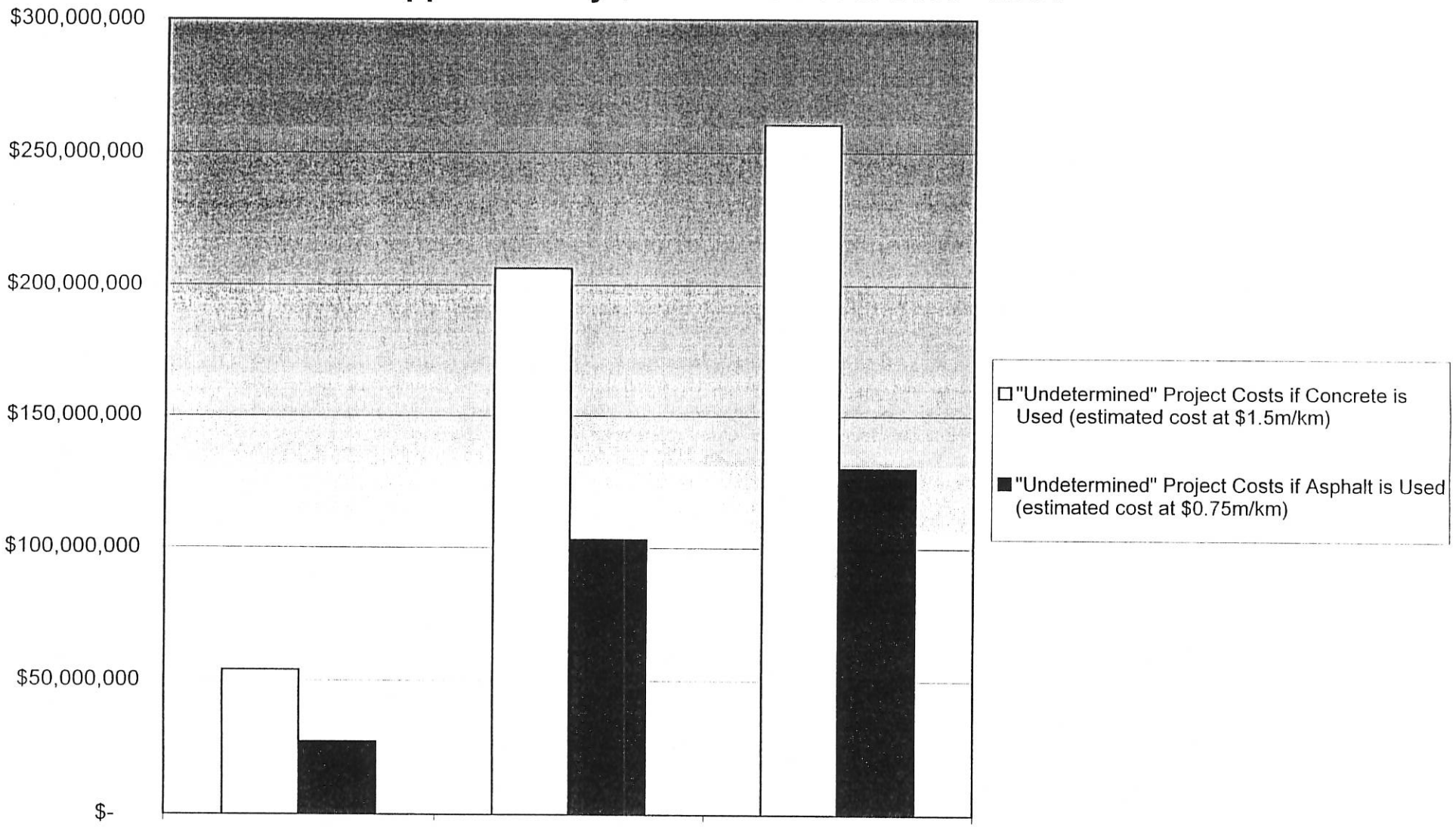
In a 1999 letter evaluating the surfacing recommendation for sections of 169 Highway, the KDOT engineering staff recommended asphalt over concrete, stating asphalt "has the lowest initial cost and can be considered to have the lowest life cycle cost, also." (See Exhibit C.) In addition, the engineering staff noted that the disruption to the traveling public would be less with asphalt rehabilitation than it would be for reconstruction of a concrete roadway. The staff also notes the KDOT bias toward concrete, stating that the asphalt recommendation "will be very unpopular in many parts of KDOT, however until we as an agency deem one material superior to another, we need to be fiscally responsible in selecting surfacing alternatives."

Using Asphalt Instead of Concrete will Save $153,431,000 over the Next Two Years.



(Using avergage cost/km of KDOT 2000-2004 projects.)

Choosing Asphalt over Concrete for "Undetermined" Projects will Save Approximately $130 million over 2003 - 2004



(Using avergage cost/km of KDOT 2000-2004 projects.)

EXHIBIT "C"

Kansas Department of Transportation
BUREAU OF MATERIALS & RESEARCH
GEOTECHNICAL UNIT - PAVEMENT SECTION
2300 VAN BUREN
TOPEKA, KS 66611-1195
(785) 296-3008
FAX NO. (785) 296-2526

June 24, 1999

RE: 169-61 K-7141-01
0.9 km SW of K-7 Interchange, NE to
0.5 km SW of Interchange at Paola
169-61 K-7142-01
0.5 km SW of Interchange at Paola,
NE and N to Existing Four Lanes
Miami County

MEMORANDUM TO: MR. WARREN L. SICK, P.E., ASSISTANT SECRETARY & STATE TRANSPORTATION ENGINEER

SUBJECT: PROJECT SURFACE TYPE

The comments for project surface type have been received from the reviewers for the referenced project. The scope of the projects is the addition of two new lanes and the rehabilitation of the existing lanes to provide a four-lane freeway. The pavements will include 1.8 m and 3.0 m paved shoulders. Construction is to be done within the existing right-of-way. Although the project scope calls for rehabilitation of the exiting lanes, provisions have also been made for reconstruction of the existing lanes. The reconstruction is included to assess its impact on the project as a whole. Four alternates were presented for the reviewers' comments and selections.

Alternate One, construction of new lanes and reconstruction of existing lanes with concrete pavement, was selected as the preferred surfacing by three of the five reviewers. Their primary reason was the least life cycle cost, reduced maintenance, and least disruption to traveling public after construction is complete. Except for Alternate Two, the life cycle cost is equivalent (<5%) for the other alternates. Similar life cycle costs say that if we construct an alternate at some initial cost and put an appropriate amount away to construct subsequent actions, in the end we will have spent the same amount. The statement is true provided we have been wise enough to accurately predict performance and properly account for the time-value of money. Since there is no alternative that has a significant lowest life cycle cost, the selection based on life cycle cost alone may not be the best decision. The reduction in future costs and least disruption to the traveling public are valid arguments. The future costs are, however, included in the life cycle costs. One has to ask, is the disruption to the traveling public worth approximately $7,000,000 in initial cost for each project? The initial cost savings are in real dollars.

Alternate Three, construction of new lanes with concrete pavement and rehabilitation of existing lanes, was selected by the remaining two reviewers. The main reason for their selection was the lowest initial cost for this alternate. The existing pavement is still in reasonably good condition, and the destruction of this pavement may incur a negative perception from the public. Although the majority of reviewers selected Alternate One, we believe that Alternate Three should also be considered a viable selection.

In the selection of these alternates, there is an element of risk that weighs in the decision process. Concrete pavement is perceived to be maintenance free and carries a lower risk associated with premature failure. These factors weigh heavily in the selection process. A balance between these factors and the cost must be maintained. Intangible factors were addressed in the investigation. No clear conclusions or recommendations surfaced that would assist in selecting one alternate over the other.

Evaluation of the costs, both initial and life cycle, and the arguments made by the reviewers causes us to break with the majority decision. We are advancing Alternate Four, reconstruction and rehabilitation with asphaltic concrete, for your approval. Alternate Four has the lowest initial cost and can be considered to have the lowest life cycle cost, also. Rehabilitation of the existing lanes even with traffic detoured has to take less time than reconstruction of those lanes, thus presenting less exposure time of the traveling public to head-to-head traffic. Using one type of surfacing material should cause fewer problems in the bidding process and in the execution of the work. This recommendation will be very unpopular in many parts of KDOT, however until we as an agency deem one material superior to another, we need to be fiscally responsible in selecting surfacing alternates. The combined estimated initial cost savings for both projects between the preferred alternate and this alternate is $14,810,000.

Copies of the Report of Pavement Investigation, Project Surface Type forms 1142, and the reviewers' comments are attached. Please return the signed Project Surface Type form to Mr. G.N. Clark. If you have any questions regarding the selected surfacing, please contact Mr. Andrew Gisi.

G.N. CLARK, P.E.
GEOTECHNICAL ENGINEER

A.J. GISI, P.E.
ASSISTANT GEOTECHNICAL ENGINEER

GNC:AJG:TML[redacted]
Attachments
c: Steve Woolington, Director of Operations
Dave Comstock, Chief of Design
Lon Ingram, Chief of Materials & Research
Rosie Ingram, Chief of Program Management
John Leverenz, District Engineer
Dean Testa, Chief of Construction & Maintenance

Kansans for Cost Efficient Roadway Construction
P.O. Box 23023
Overland Park, KS 66283

March 12, 2002

Members of the House Transportation Committee

Re: Kansas Department of Transportation Pavement Surfacing Recommendations

Mr. Chairman Hayzlett, Members of the Committee:

My name is Larry O'Donnell and I am a member of Kansans for Cost Efficient Road Construction, Inc. ("KCERC"). KCERC is a Kansas corporation that monitors and advocates concerns important to the asphalt paving industry in Kansas. KCERC asks that this Committee review the Kansas Department of Transportation's (KDOT) Pavement Surfacing Recommendations on Kansas highways and review the method used in pavement surfacing Life Cycle Cost Analysis.

Although there is no specific legislation that has been introduced to deal with these concerns, my clients would like for the Legislature to review KDOT's procedures concerning the matter.

In support of my testimony, I ask that you please accept the attached memorandum.

Respectfully submitted,

Larry O'Donnell

Attachment

RE: Highway Program

As an owner of a heavy highway paving construction company in Johnson County, Kansas, **I would like to express my grave concern about the future of the 1999 Kansas Comprehensive Transportation Plan.** KDOT in the last few years has begun specifying a much greater portion of projects with much more costly concrete pavement. This has resulted in projects itemized in the 1999 program to become over budget by about 17%. This has caused a reduction in the number of projects able to be constructed with the same funds. **There are two separate issues at hand that I would like to discuss.**

3-2

The first issue is the Life Cycle Cost Analysis used by KDOT to determine pavement types. The Life Cycle Cost Analysis that KDOT is using to select pavement types on projects is flawed. KDOT is using a Life Cycle Cost Analysis approved by AASHTO (American Association of State Highway Transportation Officials). **This analysis was approved by AASHTO in 1993, ... BUT is a re-write of the original 1956 AASHO program. It is way out of date!** The Federal Highway Administration did a major update of its Life Cycle Cost Analysis design guide in 1998. FHWA (SA-98-079) Life Cycle Cost Analysis design guide is available now and is based on a much

wider body of knowledge than the one currently being used by KDOT. KDOT should be using this new FHWA Design Guide, which reflects the new paving technologies currently being used by KDOT.

There are major differences in these two studies. First the FHWA (SA-98-079) Life Cycle Cost Analysis design guide recommends that a minimum life span be selected sufficiently long enough that all pavement alternatives go through a major rehab or reconstruction. This process also requires a complete maintenance program be determined for each pavement alternative. KDOT's current applications of life cycle cost analysis stops short of the time, major rehab or reconstruction would take place. This is a major flaw, and does not show true cost.

Under the process currently being used by KDOT to life cycle the asphalt alternative, there are actions being assigned to it for maintenance of the pavement. These actions call for milling, overlays, etc. to be done to pavements. The actions that KDOT is using are not accurate! These actions far exceed any that have been required or done in the past by KDOT. Neither my firm, nor any of the other asphalt paving firms in Kansas is doing the actions they are calling for. Recently, a project was life cycled on I-70. When the life cycle was complete it showed that 31 inches of asphalt would be needed. This is a bogus finding.

The second issue is that KDOT's life cycle does not give credit for the new technology in asphalt pavement construction, which is superpave. As a rock producer and asphalt producer in Kansas, we are hauling aggregates from Arkansas, Missouri, Oklahoma, and South Dakota in order to make superpave asphalt mix. This is in lieu of using local aggregates. This is at great additional cost. KDOT is paying this additional cost for their projects. This superpave mix is performing beyond expectation. But yet we are not getting credit for this in the Life Cycle Cost Analysis. This makes no business sense at all!

I would like to close with a few comments. Our state is facing an economic crisis! **The initial and life cycle cost of asphalt is less...why are we spending more on concrete? We have historical data, i.e., "Cross Study" showing asphalt is cheaper to maintain than concrete...why are we using so much concrete?** These decisions are costing the taxpayers of Kansas hundreds of millions of dollars. These life cycle and pavement type decisions by KDOT are not fair to the taxpayers

of Kansas. The budget has been over-spent, and we must act before the CTP goes down the tube.

Thank you for your time and attention in this matter today.

Footnote:

I have included in your packet of information a Position Paper on Asphalt vs. Concrete surfaces on Kansas highways, a graph showing savings using asphalt over concrete over the next two years on the CTP, a graph showing asphalt over concrete for undetermined projects, and a letter from one of KDOT's own engineers questioning their pavement decision for the 169 Highway project.

Kansans for Cost Efficient Roadway Construction
P.O. Box 23023
Overland Park, KS 66283

March 12, 2002

Members of the House Transportation Committee

Re: Kansas Department of Transportation Pavement Surfacing Recommendations

Mr. Chairman Hayzlett, Members of the Committee:

My name is Don Popejoy and I am a consultant for Kansans for Cost Efficient Road Construction, Inc. ("KCERC"). KCERC is a Kansas corporation that monitors and advocates concerns important to the asphalt paving industry in Kansas. KCERC asks that this Committee review the Kansas Department of Transportation's (KDOT) Pavement Surfacing Recommendations on Kansas highways and review the method used in pavement surfacing Life Cycle Cost Analysis.

Although there is no specific legislation that has been introduced to deal with these concerns, my clients would like for the Legislature to review KDOT's procedures concerning the matter.

In support of my testimony, I ask that you please accept the attached issue outline.

Respectfully submitted,

Don Popejoy

Attachment

House Transportation Committee
March 13, 2002
Attachment 4

TESTIMONY

Date: March 13, 2002
Before: House Transportation Committee
By: Donald G. Popejoy, Consultant,
Kansas Asphalt Pavement Association
Regarding: Cost Comparison of Hot Mix Asphalt and Portland Cement Concrete Pavements of Rural Kansas Highways

Good Morning Mister Chairman and Members of the Committee:

My name is Don Popejoy. I live in Wichita, Kansas. I graduated from Kansas University in 1961 with a degree in Civil Engineering. I worked as CEO of Popejoy Construction Company, Inc., an asphalt paving company, in Ulysses, Kansas until 1996. Upon the acquisition of the paving assets of Popejoy Construction by the Ritchie Paving Co., Inc, in Wichita, Kansas, I worked as Executive Vice President until my retirement in 2001. I presently do special projects for Ritchie on a part time basis, and perform consulting services for the Kansas Asphalt Pavement Association.

I thank you for the opportunity to provide testimony relating to the comparison of costs between Hot Mix Asphalt Pavements, and Portland Cement Concrete Pavements, on rural Kansas roadways.

The foundation for my testimony is the study done by Prof. Stephen A. Cross and Prof. Robert L. Parsons, of the University of Kansas, entitled *Evaluation Of Expenditures On Rural Interstate Pavements in Kansas*. I am pleased to provide you a copy of the referenced report today.

This study, dated February 2002, involved the evaluation of rural interstate pavements on I-35, I-135, and I-70 in Kansas. The study evaluated 219 Miles of Portland Cement Concrete pavement and 262 miles of Hot Mix Asphalt pavement.

The first purpose of the study was to evaluate the historical expenditures for rural interstate pavements in Kansas. The second purpose was to evaluate historical performance and cost data in comparison with Life Cycle Cost Analysis input parameters currently used in the pavement selection process.

The significant findings of the first purpose for the Cross-Report are:

1. The study found that although the Portland Cement pavements carried 29% more total traffic than the Hot Mix Asphalt pavements, both types of pavements carried virtually the same number of heavy commercial vehicles. The difference in heavy commercial traffic between the two pavement types is less than 1.3%. The effect of traffic is therefore minimal on the difference in performance between the pavement types.
2. The average original construction costs for Portland Cement pavements were higher than Hot Mix Asphalt pavements. Expressed in 2001 dollars, Concrete pavements cost $742,000 per 4-lane mile, and Asphalt pavements cost $576,000 per 4-lane mile.
3. Annual expenditures per year over the first 14 years of life were slightly higher for the Asphalt pavements. Annual expenditures over the next 27 years of life were 2.4 times higher for Concrete than Asphalt pavements, $63,000 per 4-lane mile for Concrete, compared to $26,000 for Asphalt, expressed in 2001 dollars.
4. Both types of pavements had similar average service lives until either rehabilitation or reconstruction, 33 and 34 years for Asphalt and Concrete, respectively. Reconstruction costs for Concrete pavements averaged $2.04 million per 4-lane mile compared to rehabilitation costs of $0.66 million per 4-lane mile for Asphalt pavements, in 2001 dollars.
5. For the rural interstate pavements evaluated the total expenditures in actual dollars and in 2001 dollars is dramatically less for the Hot Mix Asphalt Pavements than the Portland Cement Concrete Pavements.

The significant results of the second purpose of the Cross-Report are:

1. The average service life for both types of pavement is virtually the same. The average life of Hot Mix Asphalt pavements is 33 years until complete rehabilitation is required, while the average life for Portland Cement Concrete pavements is 34 years until complete reconstruction is required.
2. Both types of pavement require, on the average, three remedial actions between initial construction and final rehabilitation and reconstruction.

KDOT presently uses input parameters to determine the Life Cycle Cost of each pavement type that differ substantially from those recommended by the

Cross-Report. These Life Cycle Cost analyses are used as a tool to help KDOT decide which type of pavement material to ultimately specify for a project.

At the request of the Kansas Asphalt Pavement Association, I made a comparison of initial costs and life cycle cost analyses of five randomly selected projects.

The KDOT results are as presented below, in tabular format. The initial costs of the project are from the KDOT reports. The 30-Year life cycle costs are also from the KDOT reports.

Project Number	Initial Cost Asphalt	Initial Cost ConcreteA	30 Year Cost sphalt	30 Year Cost Concrete
I-70-99K6357-01	$14,500,000	$17,900,000	$21,300,000	$19,800,000
56-57 K 5745-01	$3,044,285	$3,306,332	$4,038,119	$3,712,212
77-57 K 7417-01	$3,960,000	$4,740,000	$6,580,000	$5,750,000
50-57 K 6777-01	$6,900,000	$8,000,000	$10,800,000	$9,100,000
50-28 K 6374-01	$11,294,000	$13,813,000	$14,721,000	$13,599,000
Total (5 Projects)	$39,698,285	$47,759,332	$57,439,119	$51,961,212

In summary, analyses of KDOT show that the combined initial cost of the concrete alternate is 20% more than the cost of the asphalt alternate. The KDOT analyses also shows that the 30-Year life cycle cost of the concrete alternate is 11% less than the comparable cost for the asphalt alternate.

As requested, I also analyzed the five projects using the input parameters recommended by the Cross-Report. I also incorporated the recommendations of FHWA Publication No. FHWA-SA-98-079 which suggests using a 40 Year analysis period, and a 4% Discount Rate.

These results are as presented below, in tabular format.

Project Number	Initial Cost Asphalt	Initial Cost Concrete	40 Year Cost Asphalt	40 Year Cost Concrete
I-70-99K6357-01	$14,500,000	$17,900,000	$17,267,700	$23,736,114
56-57 K 5745-01	$3,044,285	$3,306,332	$4,387,232	$6,202,489
77-57 K 7417-01	$3,960,000	$4,740,000	$5,343,785	$7,757,148
50-57 K 6777-01	$6,900,000	$8,000,000	$9,291,833	$13,757,678
50-28 K 6374-01	$11,294,000	$13,813,000	$13,454,115	$17,297,568
Total (5 Projects)	$39,698,285	$47,759,332	$49,774,665	$68,750,997

The above results show that the 40-Year life cycle cost of the Concrete alternate is 38% more than the comparable cost of the Asphalt alternate. This is because the 40-Year cost reflects the significantly higher cost to reconstruct a concrete surface than an asphalt surface. These figures also reflect the actual costs of maintaining both types of surfacing on the rural interstate highway system in Kansas from the time of initial construction to complete rehabilitation.

In summary, the large difference between the total cost for each alternate pavement type as calculated by KDOT, compared to the total cost that I have calculated, arises from two basic considerations:

1. The 30-Year service life assumed by KDOT does not reflect the costs to rehabilitate the Asphalt pavement and to reconstruct the Concrete pavement, which occurs at Year 33 and Year 34, respectfully.
2. The input parameters used by KDOT derive from theoretical design criteria, and have no basis in historical practice, nor do they reflect actual current practice.

When applying historical data to analyze the two alternate pavement types, two conclusions become obvious:

1. Hot Mix Asphalt pavements cost significantly much less initially.
2. Hot Mix Asphalt pavements have demonstrated significantly lower costs over the entire term of the pavement life than have the Portland Cement Concrete pavements.

I will be pleased to respond to any questions you may have.

EVALUATION OF EXPENDITURES ON RURAL INTERSTATE PAVEMENTS IN KANSAS

Executive Summary

by

Stephen A. Cross, P.E.
Associate Professor
University of Kansas
Lawrence, Kansas

and

Robert L. Parsons, P.E.
Assistant Professor
University of Kansas
Lawrence, Kansas

Kansas University Transportation Center
University of Kansas
Lawrence, Kansas

February 2002

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Evaluation of Expenditures on Rural Interstate Pavements in Kansas

INTRODUCTION

The National Highway System (NHS) Designation Act of 1995 required state DOTs to conduct a life-cycle cost analysis on NHS projects costing $25 million or more. The 1998 Transportation Equity Act for the 21st Century (TEA-21) removed the requirement for LCCA on high cost NHS projects. However, the Federal Highway Administration (FHWA) still recommends LCCA and has a policy statement recommending the use of good practice, rather than specifying a single LCCA method.

One of the most comprehensive tools for LCCA is *Publication No. FHWA-SA-98-079, Life-Cycle Cost Analysis in Pavement Design.* The FHWA publication recommends procedures for conducting LCCA of pavements using Monte Carlo simulation procedures to account for the uncertainties associated with LCCA inputs.

The final results from any LCCA procedure, regardless of sophistication, is no better than the input variables. To that end, the purpose of this study was to evaluate the historical expenditures for rural interstate pavements in Kansas and to provide historical performance and cost data to evaluate the assumptions associated with LCCA input parameters currently used in Kansas.

SCOPE

This study involved the evaluation of rural interstate pavements on I-35, I-135 and I-70 in Kansas that are administered by the Kansas Department of Transportation (KDOT). The sections of interstate pavement administered by the Kansas Turnpike Authority (KTA)

were not evaluated. The rural interstate sections evaluated on I-35 consisted of the section from the intersection of US-50 in Lyon County near the Emporia city limits to the west Johnson County line. The rural interstate sections evaluated on I-135 consisted of the section from the intersection with I-70 to the north Sedgwick County line. A 4.5-mile section through the city of Newton in Harvey County was excluded. The counties evaluated on I-70 included the section from the west Shawnee County line to the Colorado State line, excluding Logan County. The section of I-70 through Logan County is less than one mile long. Figure 1 shows the location of the counties and routes evaluated with the heavy commercial vehicles per county.

ANALYSIS PROCEDURE

Mainline Paving

Expenditures were determined for mainline paving only. Mainline paving is defined, for the purpose of this study, as the 24-foot wide travel lanes, shoulders and ramps. Excluded from mainline paving were bridges, bridge approach slabs, cross roads, drainage structures, rest areas, and other ancillary work or structures.

Expenditures were classified as original construction, maintenance work (minor and structural overlays), rehabilitation and reconstruction. Expenditures for the above actions were determined from contract bid sheets obtained from the Kansas DOT Bureau of Construction records. Construction contracts generally do not cross county lines and the records are stored by county. Due to the size of the counties, two or more contracts were often required for original construction. Later maintenance, rehabilitation and reconstruction contracts did not necessarily follow the original construction sections. Therefore, the analysis was performed on a section by section basis within each county.

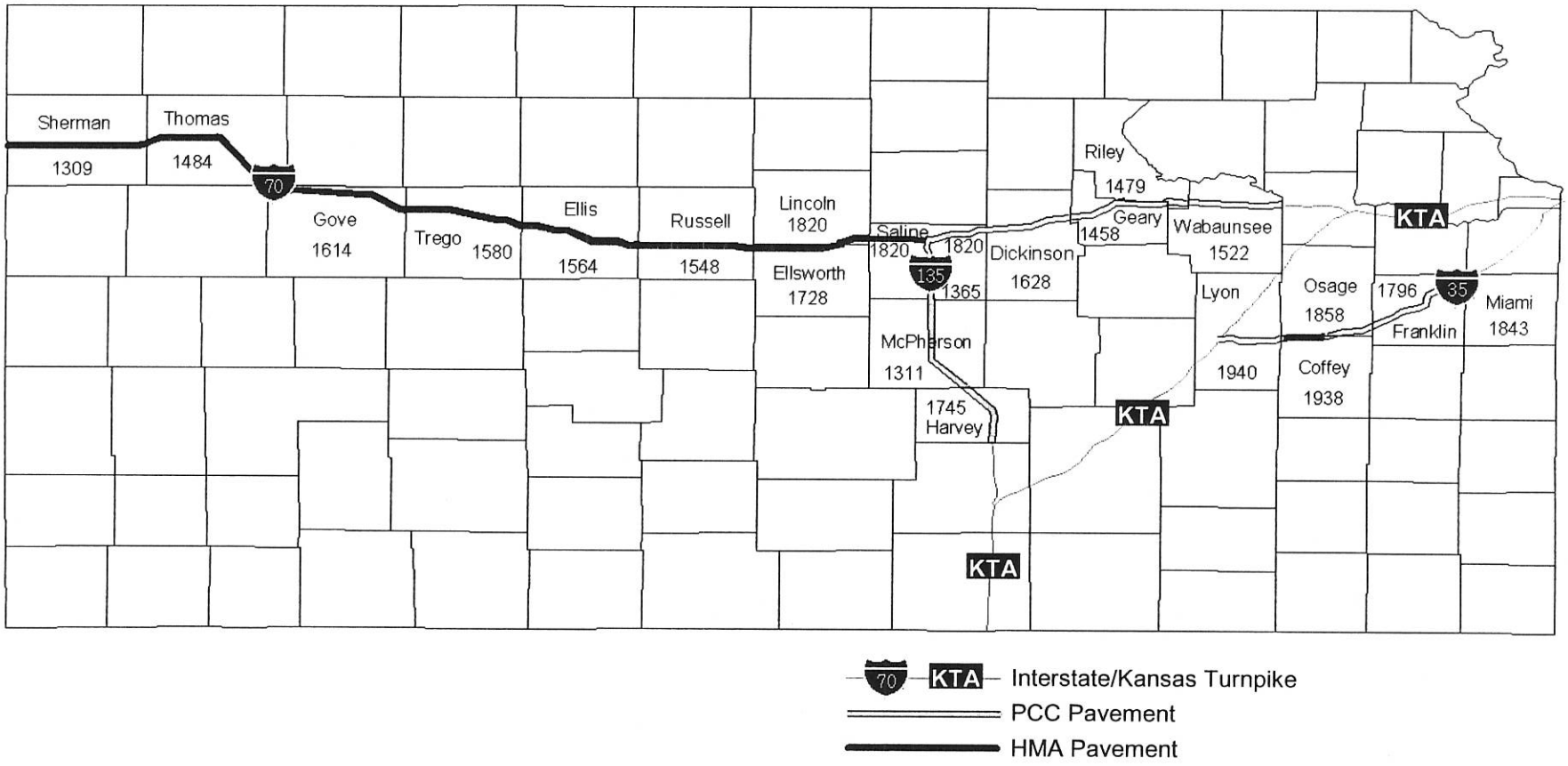


Figure 1: Location of Rural Interstate Pavements in Kansas with Average Daily Truck Traffic.

The only requirements for section boundaries were that all miles in each section have the same original construction date and, if reconstructed or rehabilitated, the same reconstruction or rehabilitation dates.

Original Construction

Typical Portland cement concrete (PCC) pavement sections for original construction consisted of a 9-inch thick slab over a 4-inch thick aggregate base. Lime stabilized subgrades were used on the majority of the pavements. Shoulders were either aggregate or hot mix asphalt (HMA).

Typical HMA sections for I-70 consisted of 15 inches of full depth HMA with HMA shoulders. The final three inches of the pavement were not placed initially due to budgetary constraints but were planned for a later date. The authors have referred to this as planned staged construction (PSC). The HMA pavement on I-35 was placed full depth and was 19.5 inches thick.

Separate contracts were generally let for grading and drainage, bridges and for paving. The contracts for bridges and grading and drainage were not included in the expenditures for mainline paving. The cost of grading and drainage is a function of topography and not the pavement type. Other items excluded from mainline paving included drainage structures, bridge approach slabs, guardrail fence and signing.

Change orders for original construction were low, generally less than 5%. However, change orders could not be ignored because some later maintenance contracts, entirely related to mainline paving, had change order amounts that exceeded the original bid price. The bid item sheets had the total cost of change orders but did not specify the items to which they were applied. Total mainline paving expenditures were determined

by applying the ratio of total expenditures to bid price for the entire contract to the sum of the mainline paving bid items. For example, if the change orders were 5% of the original bid price, the bid mainline paving expenditures were increased 5% to determine the total mainline paving expenditures.

Maintenance Work

Maintenance work was either let as a construction contract or as a maintenance contract. All construction and maintenance contracts relating to mainline paving were included. The majority of the construction/maintenance contracts were exclusively for mainline paving items. State supplied maintenance was not included because the records are not readily available and the cost is generally considered minimal on a per mile basis.

Reconstruction / Rehabilitation

Reconstruction

Many of the PCC pavement sections have been or are currently being reconstructed. The major distress was reported as joint deterioration due to D-cracking, faulting or spalling. As with new construction, only mainline paving items were included in the analysis. Mainline paving items for reconstruction included traffic control, rock excavation (removing existing PCC pavement), recompacting the subgrade, subgrade stabilization, installing drainable base and edge drains, and paving the driving lanes, shoulders and ramps. All reconstructed sections consisted of 11-12 inch thick PCC slabs with tied concrete shoulders. Drainage structures, bridges and bridge approach slabs were excluded from mainline paving items.

There were four original HMA sections that were reconstructed. One of the sections was a whitetopped section that was reconstructed in full depth PCC. The other

three sections were HMA sections that were reconstructed using full depth HMA. Mainline paving items for HMA reconstruction were determined in the same manner as for reconstruction of PCC pavements.

Rehabilitation

The majority of the HMA sections on I-70 have undergone rehabilitation to correct distress caused by thermal cracking. Rehabilitation typically consisted of injecting the thermal cracks with a type C fly ash slurry, cold milling to a depth of four inches, cold in-place recycling to a depth of four inches and placing six inches of HMA. Thermal cracking has not occurred on the HMA section on I-35. There were two PCC sections that were rehabilitated using rubblization. Mainline paving items for rehabilitation were determined in the same manner as for reconstruction.

Mobilization was a separate line item for later construction contracts, including all reconstruction and rehabilitation projects. Mobilization was apportioned to mainline paving using the ratio of mainline paving to total bid price, excluding mobilization from both items. For example, if the total bid price minus mobilization was $1,000,000 and the mainline paving expenditures minus mobilization was $750,000, then 75% of the mobilization cost was added to the mainline paving expenditures to determine total mainline expenditures. Detailed lists of items included in mainline paving are presented in the final report by the authors.

Cost per 4-Lane Mile

The analysis was performed using the total mainline expenditures for the project (bid total + change orders). The mainline bid totals were used for projects that were not finalized. All sections of rural interstate pavements evaluated were four lanes wide, two

lanes in each direction. Therefore, all expenditures for mainline paving were adjusted to a cost per 4-lane mile basis for analysis. That is, all costs were converted to a cost per centerline mile of 4-lane pavement. Expenditures were applied in the year the project was completed.

A portion of the original PCC sections on I-70 utilized the recently constructed alignment of US-40 for two of their four lanes. This was true for all 5.9 miles of Riley County, 2.5 miles of the 26.3 miles in Geary County and 5.8 of the 23.6 miles in Wabaunsee County. To account for this, the expenditures per 2-lane mile were doubled to estimate the 4-lane mile cost. This adjustment affected 14.2 miles of the 219 miles of PCC pavement evaluated.

Most maintenance contracts did not correspond to the pavement analysis sections. If the pavement analysis section fell completely within the maintenance contract, the cost per 4-lane mile of the maintenance treatment is the same as for the section. The total expenditure for the pavement analysis section would be the per mile cost multiplied by the length of the section. If the maintenance contract covered only a portion of the pavement analysis section, then the expenditures were apportioned to the section. The total expenditures for the pavement analysis section would be the per mile cost of the contract multiplied by the length of the action in the pavement analysis section. The cost per 4-lane mile would be the total cost in the section divided by the length of the section. For example, a 25-mile maintenance contract for $250,000 that covered 12 miles of a 15-mile pavement analysis section would have a per mile cost of $10,000. The total expenditures in the pavement analysis section would be $10,000 per mile x 12 miles or

$120,000. The cost per 4-lane mile in the pavement analysis section would be $120,000 ÷ 15 miles, or $8,000 per 4-lane mile.

Analysis Methodology

All of the pavements were not the same age. Therefore, comparisons were made using inflation adjusted dollars. An annual inflation rate of 3.5% was used, and all costs were brought forward to 2001 and referred to as 2001 dollars. This inflation rate was obtained from the FHWA, in *Publication No. FHWA-SA-98-079 Life-Cycle Cost Analysis in Pavement Design.* The FHWA recommends a discount rate of 3-5% based on rates of return on 10-year treasury bonds from 1991-1996. This corresponds to an inflation rate of 3-4% annually.

FINDINGS

Summary findings for the sections of I-35, I-135 and I-70 are provided below. Detailed analyses on a section-by-section basis are available in the final report. The detailed analyses list all contract expenditures for each county in graphical and tabular form. General descriptions of the pavement sections are provided as well.

Table 1 shows the counties evaluated, the route, length of route in each county, original pavement type, year 2000 traffic data and dates of original construction. The traffic data was obtained from KDOT's *Pavement Management System 2000 NOS Condition Survey* and their *2000 Traffic Flow Map*. The traffic data reported is the one-way traffic and includes the annual average daily traffic (AADT), heavy commercial vehicles and ESALs. The ESALs are the daily 18-kip single axle loads in the design lane. ESALs are calculated for the pavement based on the current surface type. Figure 1 also shows the average one-way heavy commercial vehicles in each county.

Table 1. Rural Interstate Pavements in Kansas.

County	Route	Pavement Type	Year Opened	Length (miles)	1-Way Traffic AADT	1-Way Traffic Heavy Commercial Vehicles	1-Way Traffic ESALs*
Lyon-East	I-35	PCCP	1977	10.8	7580	1940	1739
Coffey	I-35	HMA	1973	12.1	6345	1938	1204
Osage	I-35	PCCP	1973	11.3	5589	1858	1510
Franklin-West	I-35	PCCP	1973	14.1	5721	1813	1625
Franklin-East	I-35	PCCP	1959	16.4	8836	1778	1269
Miami	I-35	PCCP	1959	2.8	9565	1843	1236
Saline	I-135	PCCP	1966-67	19.2	7380	1365	829
McPherson	I-135	PCCP	1969-72	33.6	5413	1311	967
Harvey	I-135	PCCP	1971	15.6	7860	1745	1284
Sherman	I-70	HMA	1969-70	35.3	4116	1309	1128
Thomas	I-70	HMA	1966-69	39.6	4504	1484	1034
Gove	I-70	HMA	1961-64	37.5	4507	1614	1228
Trego	I-70	HMA	1960-65	30.8	5021	1580	1149
Ellis	I-70	HMA	1965-66	31.4	5870	1564	1177
Russell	I-70	HMA	1964-66	30.0	5287	1548	1069
Ellsworth	I-70	HMA	1965	23.2	5456	1728	1295
Lincoln	I-70	HMA	1964	7.2	6190	1820	1017
Saline	I-70	HMA	1964	14.7	6310	1820	1084
Saline	I-70	PCCP	1962-65	15.2	7735	1820	1291
Dickinson	I-70	PCCP	1959-61	24.1	7332	1628	1393
Geary	I-70	PCCP	1959-65	26.3	6963	1458	1261
Riley	I-70	PCCP	1963	5.9	8035	1479	989
Wabaunsee	I-70	PCCP	1959-63	23.6	8878	1522	945

* Based on Current Surface Type

As originally built there were approximately 219 miles of PCC pavement and 262 miles of HMA pavement. Included in these totals are 27.4 miles of a PCC overlay of HMA pavement (whitetopping), of which 10.3 miles were subsequently reconstructed

with PCC pavement, all in Sherman County. McPherson County has 19.7 miles of rubblized PCC pavement.

As shown in Table 1, the PCC pavement sections carry more traffic and ESALs than the HMA sections. The 2000 AADT, weighted on a per-mile basis, was 7,120 vehicles for the PCC pavement sections and 5,085 vehicles for the HMA sections. The ESALs were 1,230 for PCC and 1,140 for HMA. The ESALs can be misleading because several of the PCC sections are covered with an HMA overlay and the ESALs are determined based on current surface type. The pavements carried virtually the same heavy commercial vehicles, 1580 for HMA and 1600 for PCC, on a weighted per mile basis. The difference in heavy commercial vehicles between the PCC and HMA sections is less than 1.3%. Therefore, the effect of traffic on the difference in performance between the pavement types is minimal.

I-35

The pavement sections evaluated on I-35 consist of 12.1 miles of HMA in Coffey County and 55.4 miles of PCC pavement in the eastern half of Lyon, Osage, Franklin and Miami Counties. The pavement sections from the eastern Lyon County line to Ottawa, Kansas were opened to traffic on the same day in 1973. This section includes the HMA section (Coffey County) and two PCC sections, Osage County and the western half of Franklin County. The eastern half of Lyon County was opened to traffic in 1977, four years later. These are the only sections of pavement on I-35 where a direct comparison of expenditures was feasible. The remainder of I-35, between Ottawa and the Johnson County line, includes two PCC sections that were opened to traffic in 1959, the eastern portion of Franklin County and Miami County. Direct comparisons between these

sections and the HMA section are problematic due to the 14-year difference in age and were not made.

The original construction of the PCC pavements from Emporia to Ottawa (Lyon-E, Osage, and Franklin-W) consisted of a 9-inch thick reinforced PCC slab over an aggregate base on a lime stabilized subgrade. The pavement had HMA shoulders. The PCC pavement sections from Ottawa to the Johnson County line did not contain a lime stabilized subgrade and had aggregate shoulders. The HMA section (Coffey County) consisted of 19.5 inches of HMA with HMA shoulders over a lime stabilized subgrade.

Table 2 shows the total expenditures per 4-lane mile in actual dollars and in 2001 dollars using a 3.5% annual inflation rate. The expenditures per county were determined by summing the total expenditures of the analysis sections for each county. Figures 2 and 3 are comparisons of the actual and inflation adjusted total expenditures, respectively, for the five PCC sections and the HMA section (Coffey County). Figure 4 is a comparison of the inflation-adjusted expenditures per year, by age of the pavement, for each analysis section.

All of the pavements in the Emporia to Ottawa section are 28 years old with the exception of Lyon County, which is 24 years old, allowing a direct comparison. Total expenditures in actual dollars for the HMA section (Coffey County) were $677,000 per 4-lane mile. The total expenditures per 4-lane mile for the PCC sections were $3,696,000 for the eastern half of Lyon County, $1,604,000 for Osage County and $2,490,000 for the western half of Franklin County. Total expenditures per 4-lane mile in 2001 dollars for the HMA section were $1,393,000. The total expenditures per 4-lane mile in 2001

Table 2. Total Expenditures per 4-Lane Mile.

County	Route	Pavement Type	Year Opened	Total Expenditures / 4-Lane Mile	
				Actual Dollars (Millions)	2001 $
Lyon-East	I-35	PCCP	1977	$3.87	$4.66
Coffey	I-35	HMA	1973	$0.68	$1.39
Osage	I-35	PCCP	1973	$1.60	$2.42
Franklin-West	I-35	PCCP	1973	$2.49	$3.35
Franklin-East	I-35	PCCP	1959	$2.55	$3.62
Miami	I-35	PCCP	1959	$0.75	$1.76
Saline	I-135	PCCP	1966-67	$3.02	$3.93
McPherson	I-135	PCCP	1969-72	$1.79	$2.62
Harvey	I-135	PCCP	1971	$1.53	$2.20
Sherman	I-70	HMA	1969-70	$1.46	$2.32
Thomas	I-70	HMA	1966-69	$1.05	$1.76
Gove	I-70	HMA	1961-64	$0.95	$1.68
Trego	I-70	HMA	1960-65	$0.86	$1.55
Ellis	I-70	HMA	1965-66	$1.29	$1.98
Russell	I-70	HMA	1964-66	$1.00	$1.64
Ellsworth	I-70	HMA	1965	$1.03	$1.74
Lincoln	I-70	HMA	1964	$0.93	$1.71
Saline	I-70	HMA	1964	$2.23	$3.11
Saline	I-70	PCCP	1962-65	$1.18	$2.22
Dickinson	I-70	PCCP	1959-61	$1.39	$2.72
Geary	I-70	PCCP	1959-65	$2.44	$3.58
Riley	I-70	PCCP	1963	$2.96	$4.03
Wabaunsee	I-70	PCCP	1959-63	$2.87	$3.79

dollars for the PCC sections were $4,662,000 for the eastern half of Lyon County, $2,419,000 for Osage County and $3,347,000 for the western half of Franklin County. The total expenditures for Osage, Franklin and Miami Counties will soon increase significantly because the remainder of the PCC sections are scheduled for reconstruction.

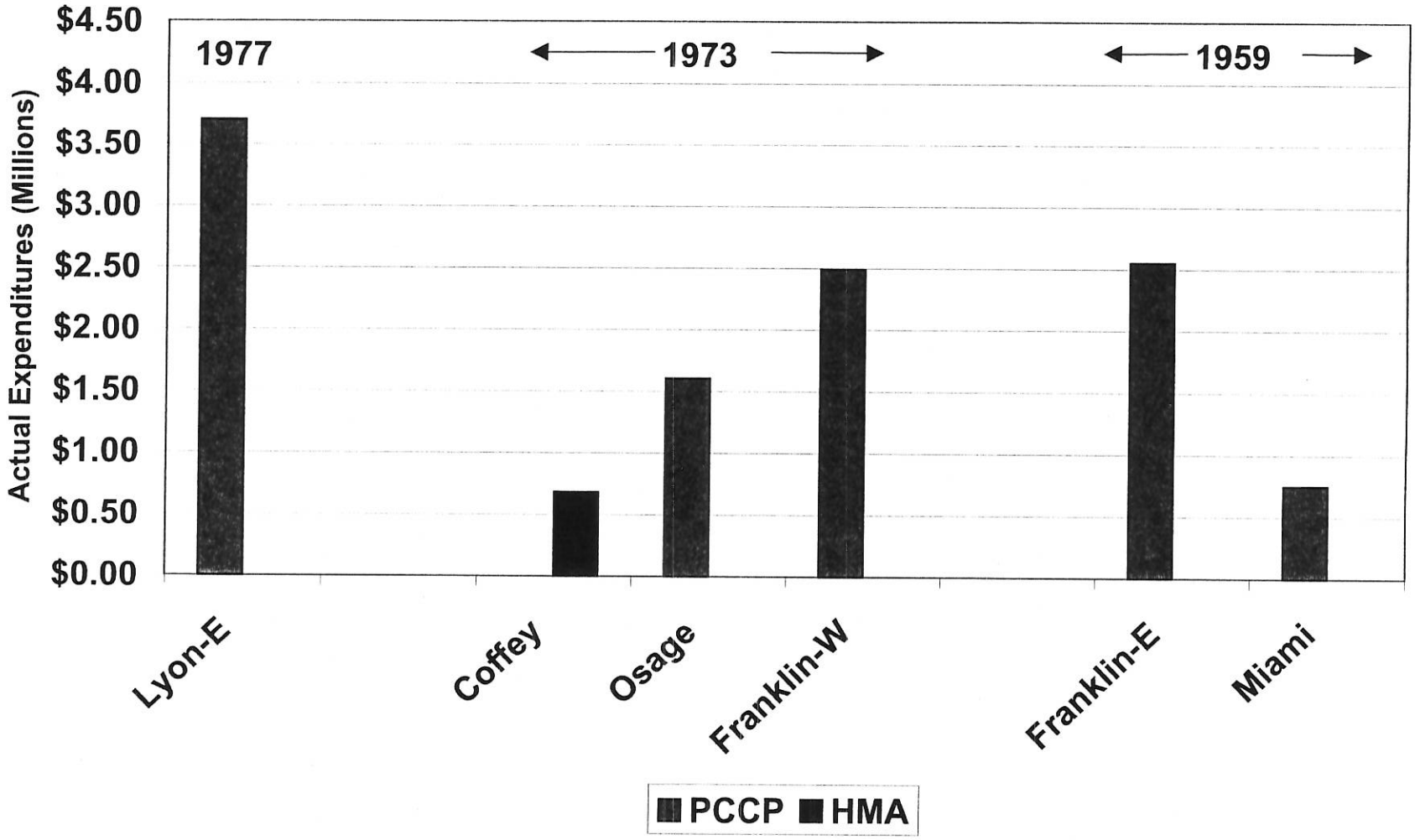


Figure 2. Actual Expenditures Per 4-Lane Mile, I-35

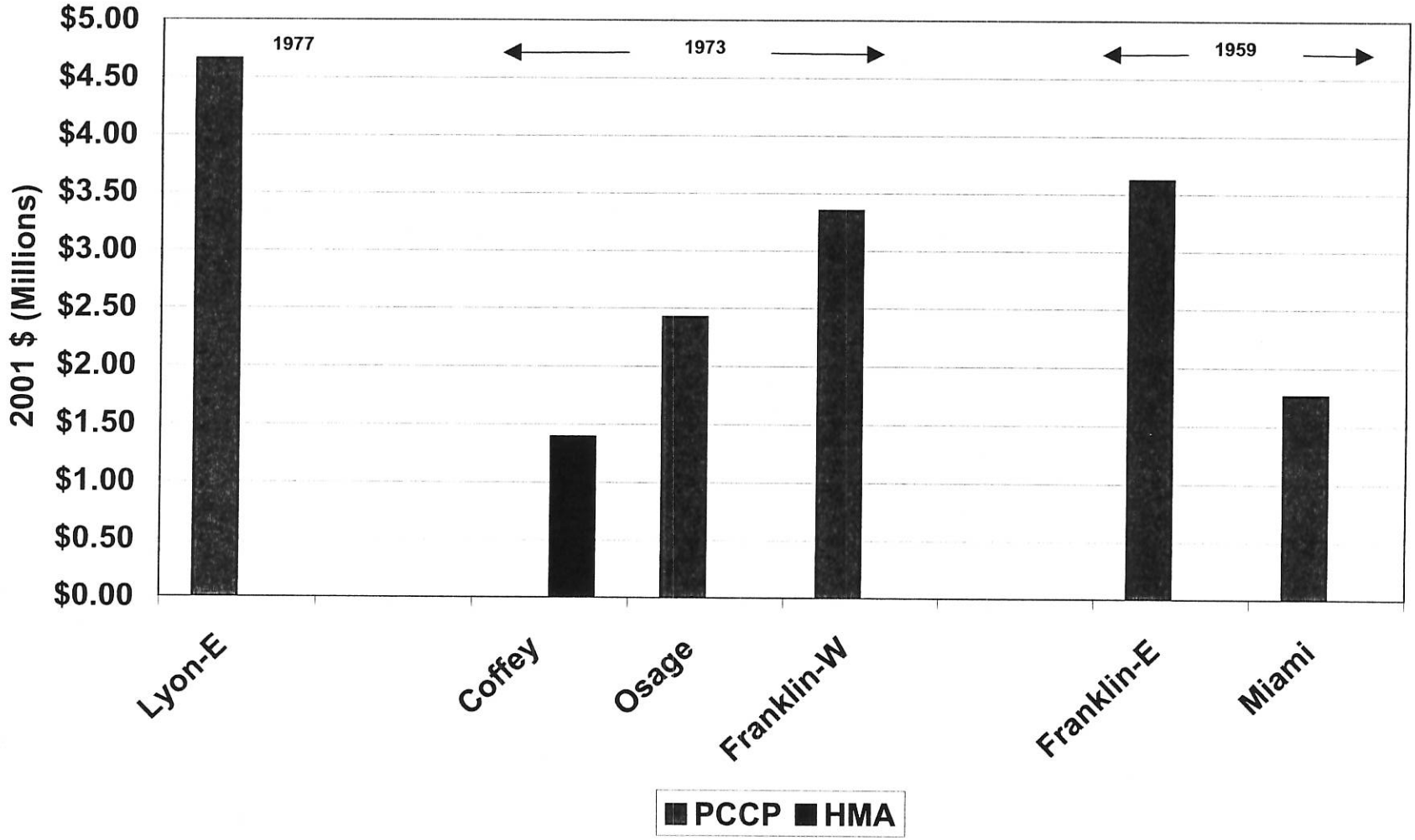


Figure 3. Inflation Adjusted Total Expenditures per 4-Lane Mile, I-35

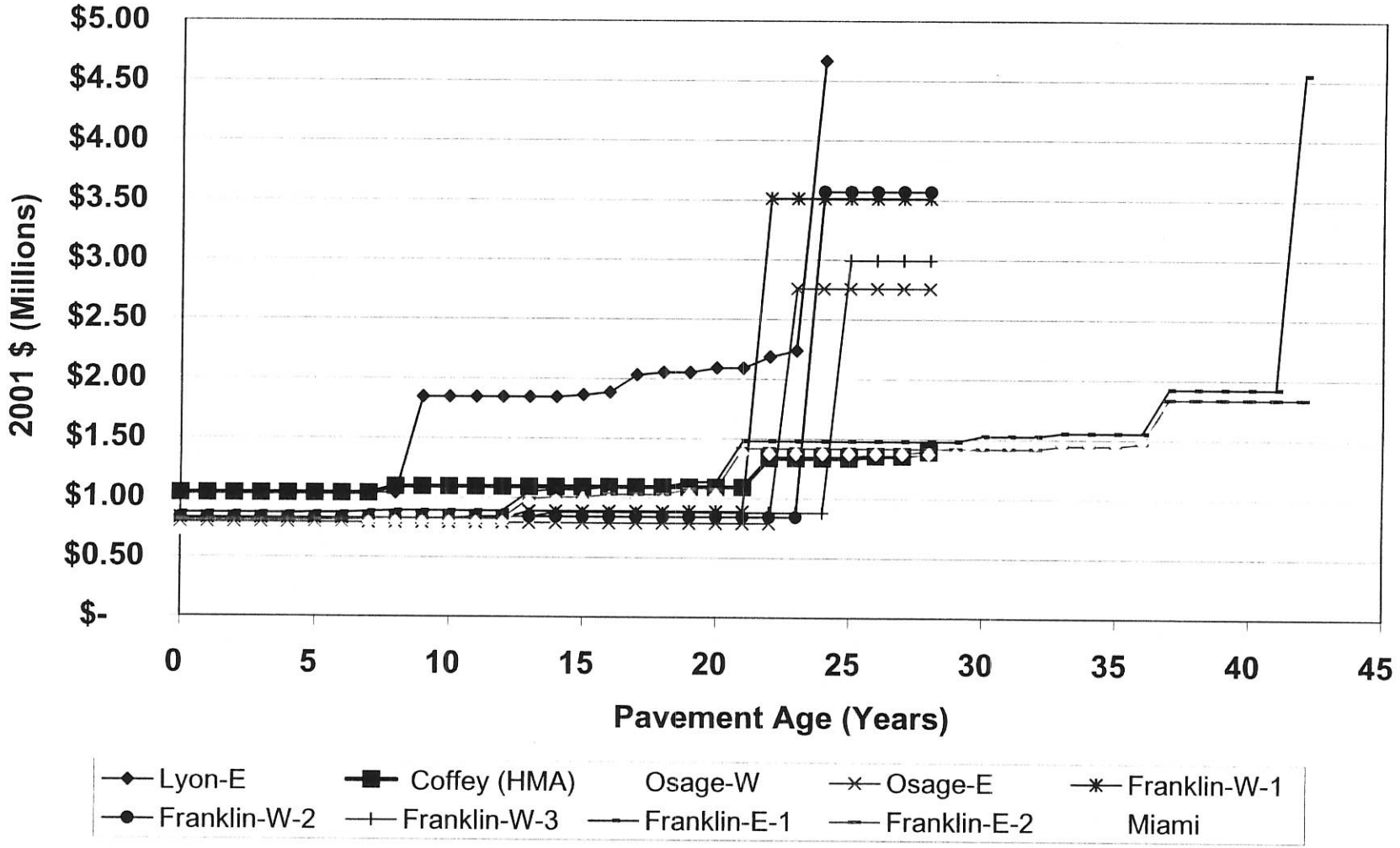


Figure 4. Inflation Adjusted Expenditures per 4-Lane Mile, by Pavement Age, I-35 Sections.

The HMA section (Coffey County) was the only HMA section evaluated that did not experience thermal cracking. Total maintenance expenditures were $281,000 per 4-lane mile ($357,000 in 2001 dollars) or less than $13,000 per year per 4-lane mile in 2001 dollars. The maintenance consisted of a machine laid seal after eight years, a three-inch overlay after 22 years and a bituminous seal after 28 years. Of the 55.4 miles of original PCC pavement on I-35, less than 27% are still in service. The 14.9 miles that are currently in service are scheduled for reconstruction.

I-135

The pavement sections evaluated on I-135 consisted of Harvey County, excluding the 4.5-mile section in Newton, McPherson County and Saline County. McPherson County was opened to traffic in two sections, one in 1969 and the other in 1972. Harvey County was opened to traffic in 1971 and Saline County in 1966 and 1967. There were no HMA sections on I-135. Table 2 shows the total expenditures for the PCC pavement sections in actual and 2001 dollars. Figure 5 is a comparison of the total expenditures in actual and 2001 dollars, by county, and figure 6 is a comparison of the inflation-adjusted expenditures per year, by age of the pavement, for each analysis section.

Of the 68.4 miles of original PCC pavements, 40.8 miles (60%) have been reconstructed at a cost of $2,152,000 ($2,257,000 in 2001 dollars) per 4-lane mile. I-135 contains the only sections of PCC pavement that have been rehabilitated. There are 19.4 miles of rubblized PCC pavement in McPherson County. The average cost of rehabilitation (rubblization) was $1,075,000 ($1,321,000 in 2001 dollars) per 4-lane mile. There are only 8.6 miles (12.6%) of original PCC pavement on I-135 that have not been reconstructed or rubblized.

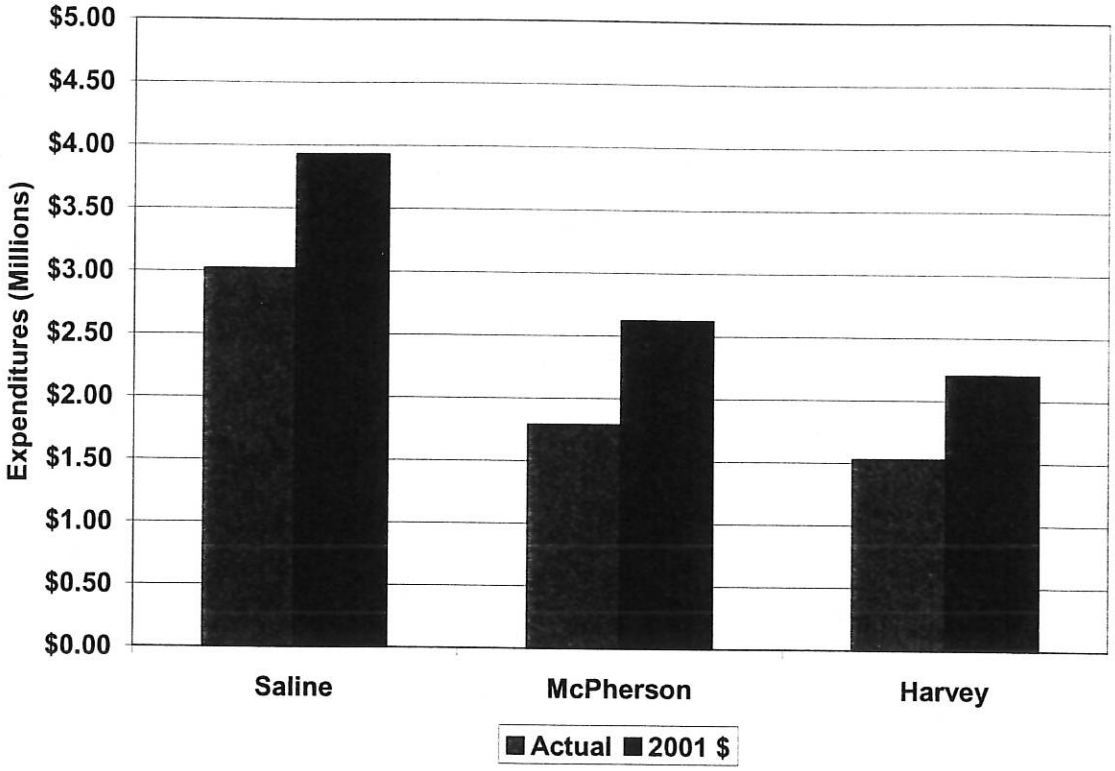


Figure 5. Expenditures Per 4-Lane Mile, I-135

I-70

Of the rural interstate sections evaluated on I-70, there are 249.7 miles of HMA pavement and 95.1 miles of PCC pavement. The HMA sections were constructed between 1960 and 1970. The PCC sections were constructed between 1959 and 1965. A portion of the original PCC sections on I-70 utilized the recently constructed alignment of US-40 for two of their four lanes. This was true for all 5.9 miles of Riley County, 2.5 miles of the 26.3 miles in Geary County and 5.8 of the 23.6 miles in Wabaunsee County. To account for this the expenditures per 2-lane mile were doubled to estimate the 4-lane mile cost.

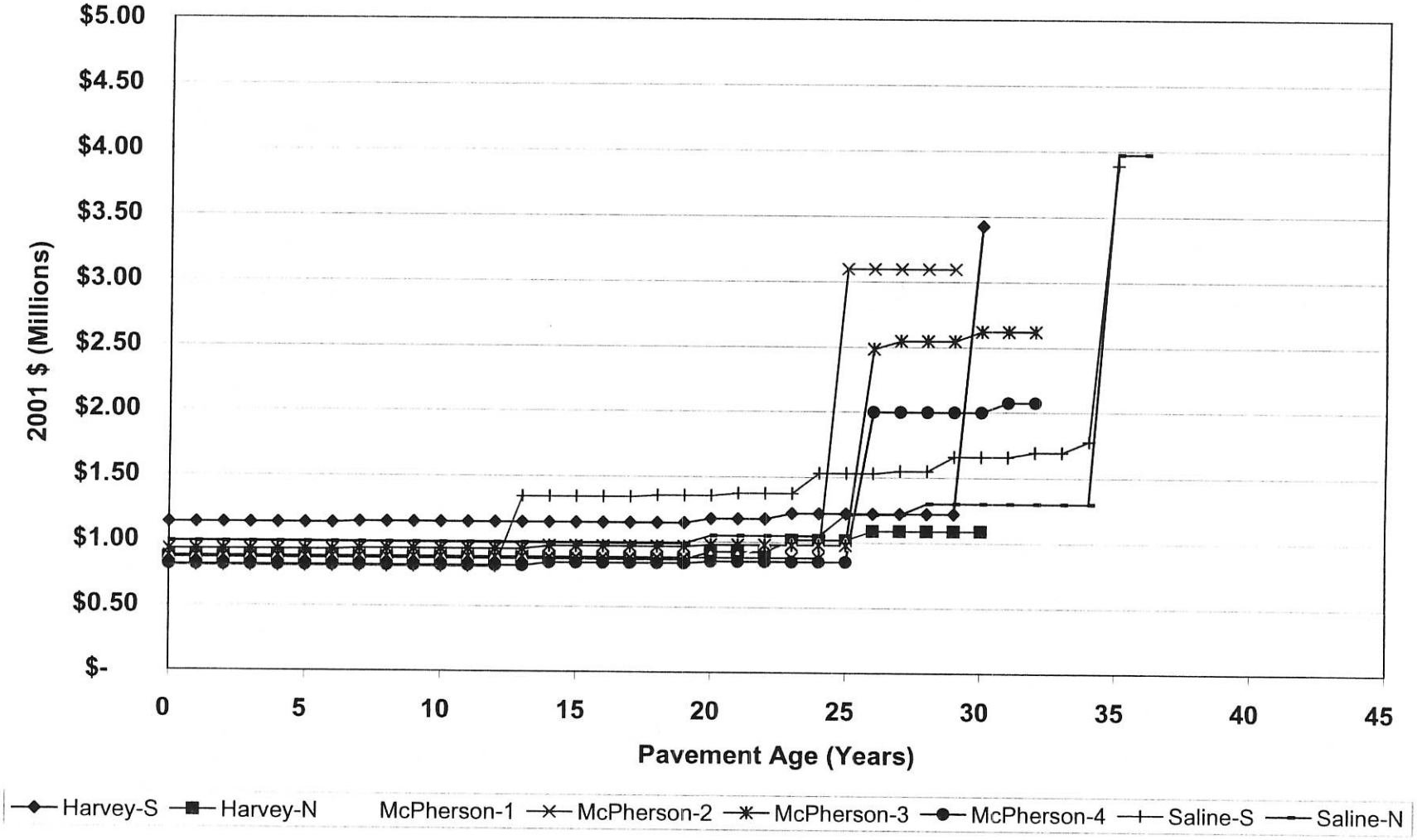


Figure 6. Inflation Adjusted Expenditures per 4-Lane Mile, by Pavement Age, I-135 Sections

Table 2 shows the total expenditures per 4-lane mile in actual dollars and in 2001 dollars using a 3.5% annual inflation rate. Figures 7 and 8 are comparisons of the actual and inflation adjusted total expenditures per 4-lane mile, respectively, for the PCC and HMA sections, by county. The expenditures per county were obtained by taking a weighted average on a per mile basis of the analysis sections in each county.

All HMA sections, with the exception of Sherman County and Saline County, have had total expenditures in actual dollars between $0.86 million and $1.29 million per 4-lane mile. The western 27.4 miles of Sherman County were rehabilitated using whitetopping. The total expenditures for the western portion of Sherman County were $1,608,000 per 4-lane mile in actual dollars and $2,518,000 in 2001 dollars. The HMA portion of Saline County, two sections totaling 14.7 miles, was reconstructed and had total expenditures of $2,227,000 per 4-lane mile in actual dollars and $3,105,000 in 2001 dollars. The PCC pavement sections had total expenditures between $1.18 million and $2.96 million per 4-lane mile in actual dollars and $2.22 million to $4.03 million in 2001 dollars.

Figures 9 and 10 are a comparison of the inflation-adjusted expenditures per year, by age of the pavement, for each analysis section for the HMA and PCC sections, respectively. As shown in figure 9, there are four HMA sections with expenditures exceeding $2.5 million per 4-lane mile, these are the four reconstructed sections. Figure 10 shows that there were only four PCC pavement sections with expenditures less than $2 million per 4-lane mile. These four sections (28.4 miles) are the only sections of PCC pavement on I-70 that have not been reconstructed.

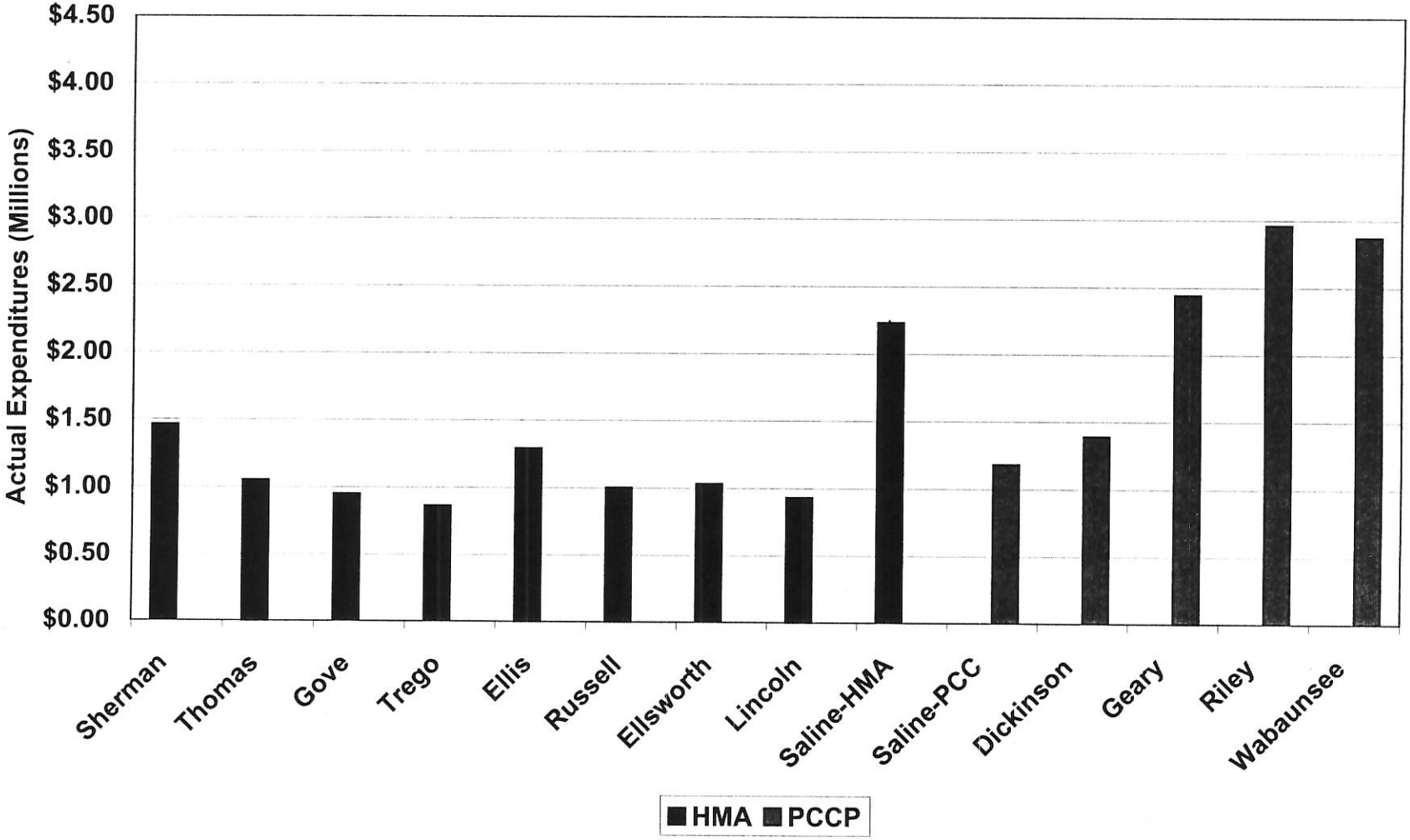


Figure 7. Actual Expenditures per 4-Lane Mile, I-70

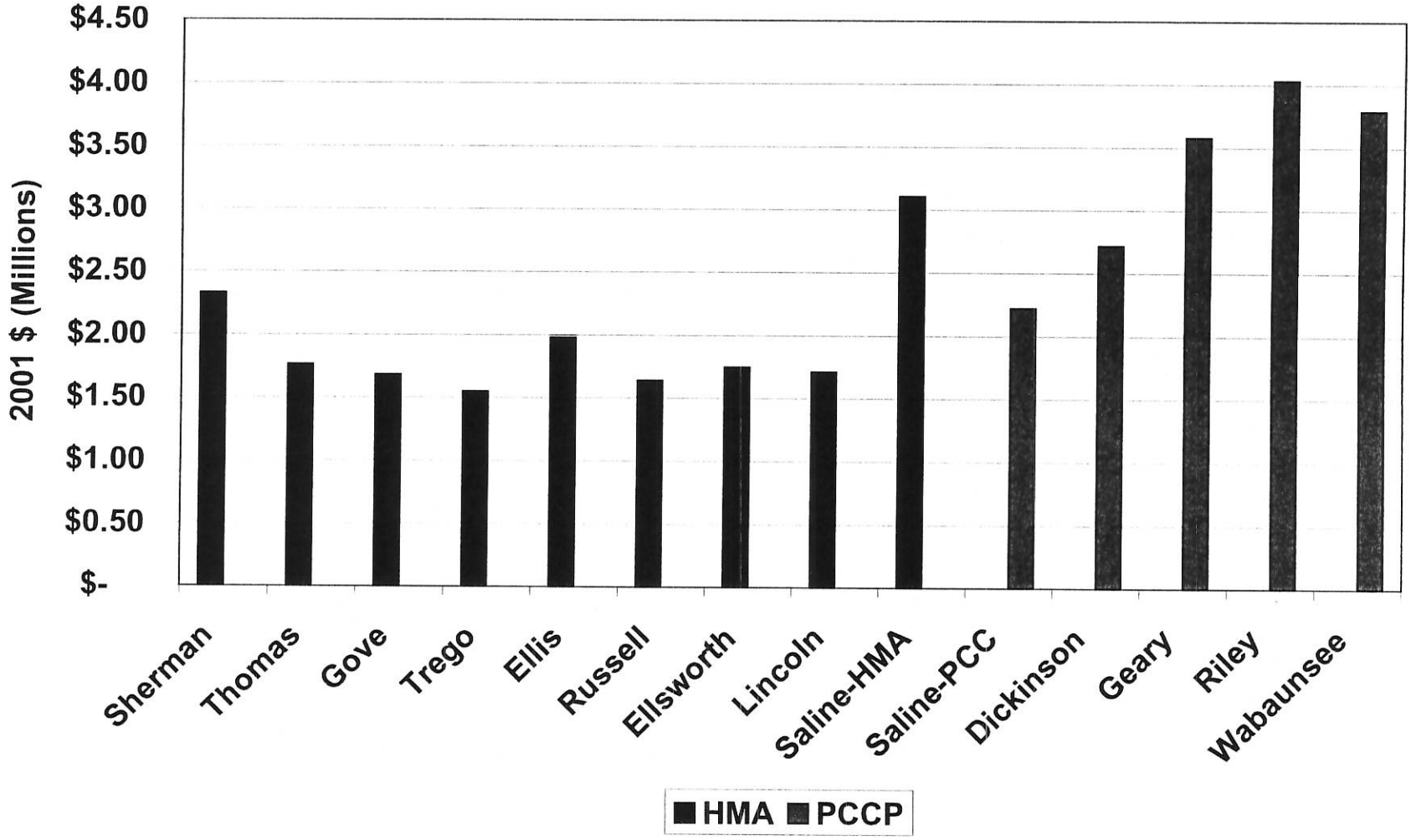


Figure 8. Inflation Adjusted Total Expenditures per 4-Lane Mile, I-70

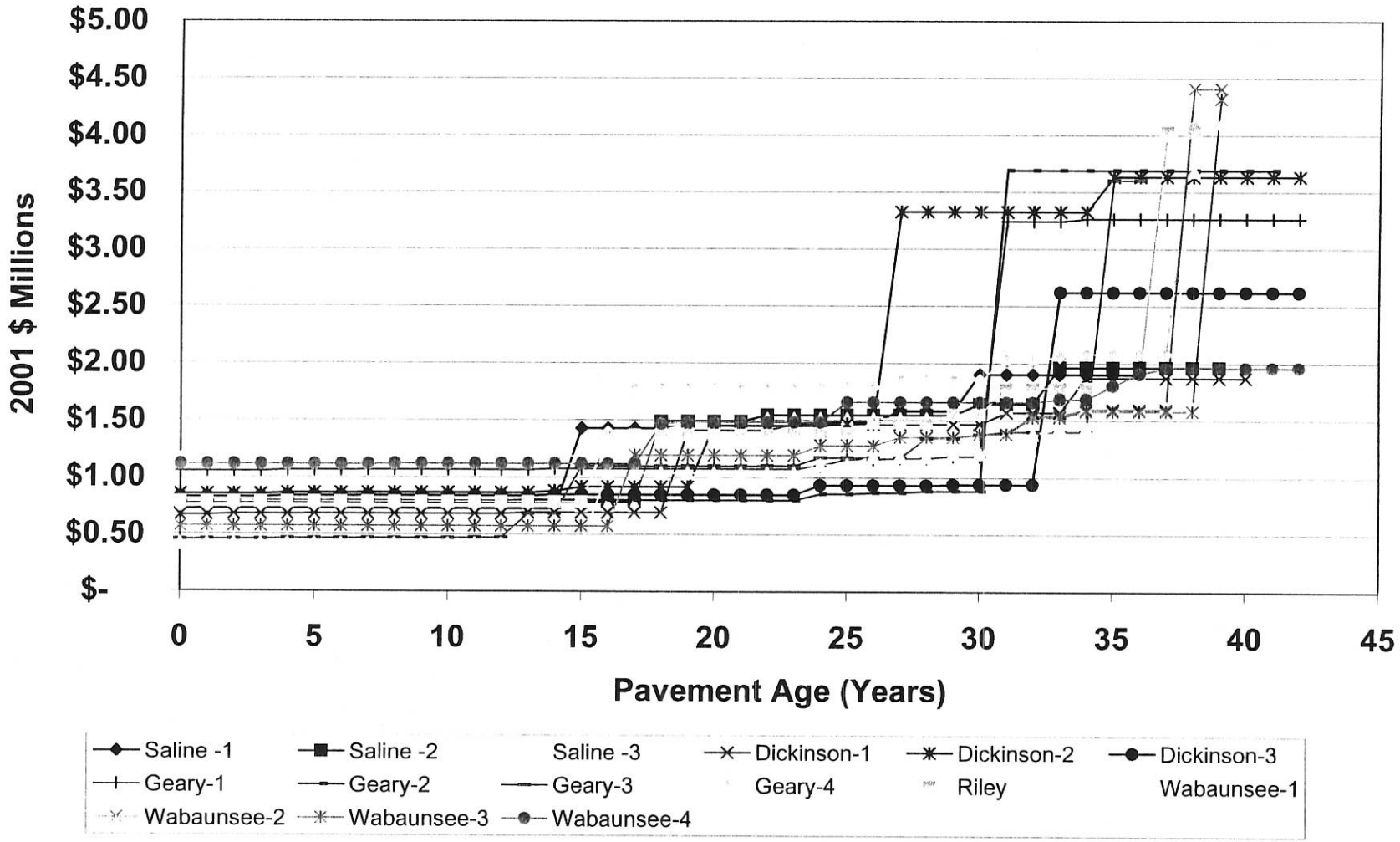


Figure 10. Inflation Adjusted Expenditures per 4-Lane Mile, by Pavement Age, I-70 PCC Sections

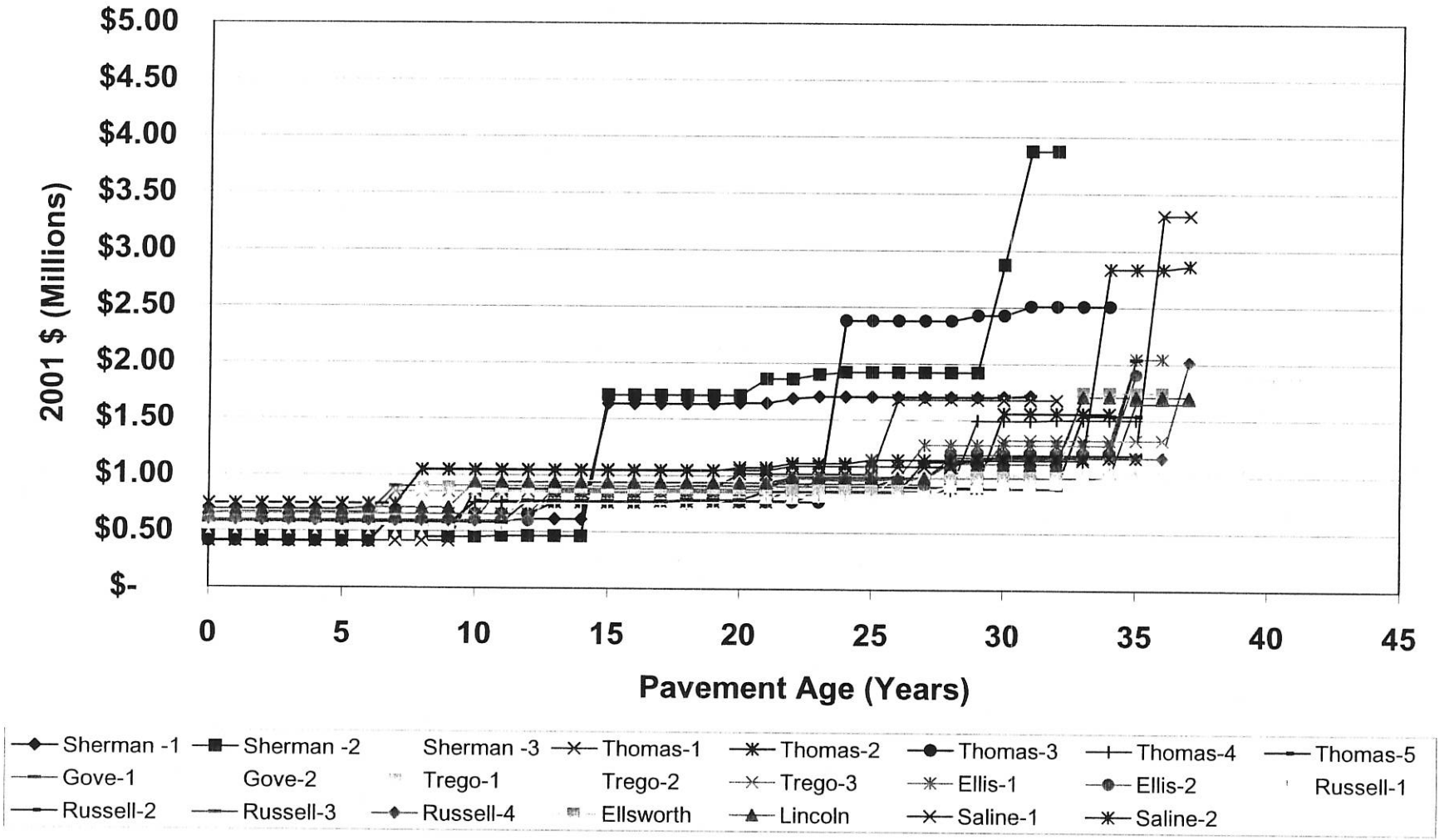


Figure 9. Inflation Adjusted Expenditures per 4-Lane Mile, by Pavement Age, I-70 HMA Sections

Of the 249.7 miles of HMA pavement on I-70, 219.70 miles have been rehabilitated and 33.6 miles were reconstructed. The majority of the rehabilitated sections, 192.3 miles, were rehabilitated using HMA recycling procedures previously described. The cost per 4-lane mile of the HMA recycling was $657,000 in 2001 dollars. There were 27.4 miles that were rehabilitated using whitetopping, Sherman sections 1 and 2. The whitetopping was performed in 1984 and 1985 at a cost of $1,106,000 per 4-lane mile in 2001 dollars. Of the four sections (33.6 miles) of reconstructed original HMA pavement, there were 10.2 miles (Sherman-2) of whitetopped pavement that was reconstructed in full depth PCC in 1999 and 2000. The remaining three sections (23.4 miles) of reconstructed HMA on I-70 included both sections of Saline County and section 3 in Thomas County. The reconstruction was performed using HMA at a cost of $1,815,000 per 4-lane mile in 2001 dollars.

There are 95.1 miles of PCC pavement on I-70, of which 52.3 (55%) have been reconstructed. None of the PCC pavement sections on I-70 have undergone rehabilitation. The average cost per 4-lane mile of the reconstruction was $2,103,000 in 2001 dollars.

Average Expenditures by Pavement Type

The average yearly expenditure per 4-lane mile by pavement age was determined by taking weighted averages per mile of each pavement analysis section. There were 24 HMA pavement analysis sections ranging in length from 4.0 to 23.2 miles and 32 PCC pavement analysis sections ranging in length from 1.9 to 13.1 miles. Pavement analysis sections were selected to give each section a discrete beginning and reconstruction or rehabilitation date. Pavement sections ranged in age from 28 to 41 years for HMA and

24 to 42 years for PCC. For calculations in excess of 28 years of age for HMA and 24 years of age for PCC, the total miles of pavement were reduced accordingly. Figure 11 shows the average inflation adjusted expenditures per year, by age of the pavement sections, for both PCC and HMA pavements.

The plots in figure 11 represent the average life-cycle cost of HMA and PCC rural interstate pavements in Kansas. The data indicates equal life-cycle cost at approximately 15 years. After fifteen years the costs diverge with the PCC sections becoming increasingly more expensive with time. The FHWA recommends (*Publication No. FHWA-SA-98-079 Life-Cycle Cost Analysis in Pavement Design)* analysis periods long enough to include one major rehabilitation for each pavement type. Figure 11 shows the consequences of analysis periods that do not include the cost of major rehabilitation or reconstruction of PCC pavements.

As shown in figure 11, a definite increase in expenditures for PCC pavements occurs at approximately 14 years of age. The HMA section shows little expenditures during the first six years then a steady increase in expenditures through year 41. Therefore, two linear regression curves were determined for each pavement type, one from 0-14 years and another from 15-42 years for PCC and from 0-6 and 7-41 years for HMA. The results are shown in figure 12. The slopes of the regression curves represent the annual expenditures per 4-lane mile.

Average original construction costs for PCC pavements were higher than HMA pavements, $742,000 to $576,000 per 4-lane mile, respectively. Annual expenditures per year over the first 14 years life were higher for HMA pavements. This is due to the PSC overlays placed between year 7 and 13 on I-70. Annual expenditures over the next 27

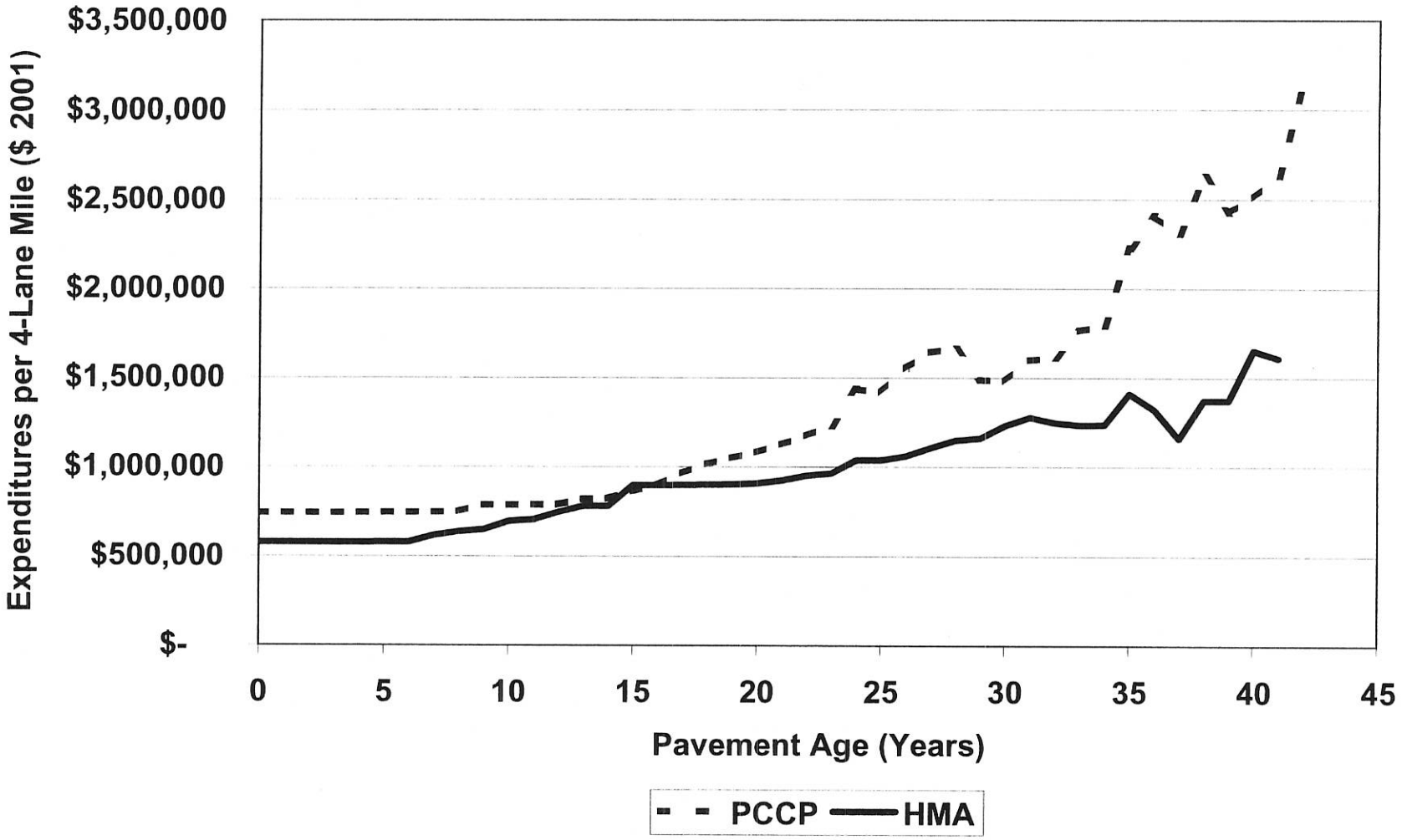


Figure 11. Inflation Adjusted Life-Cycle Cost Performance for Kansas Rural Interstate Pavements

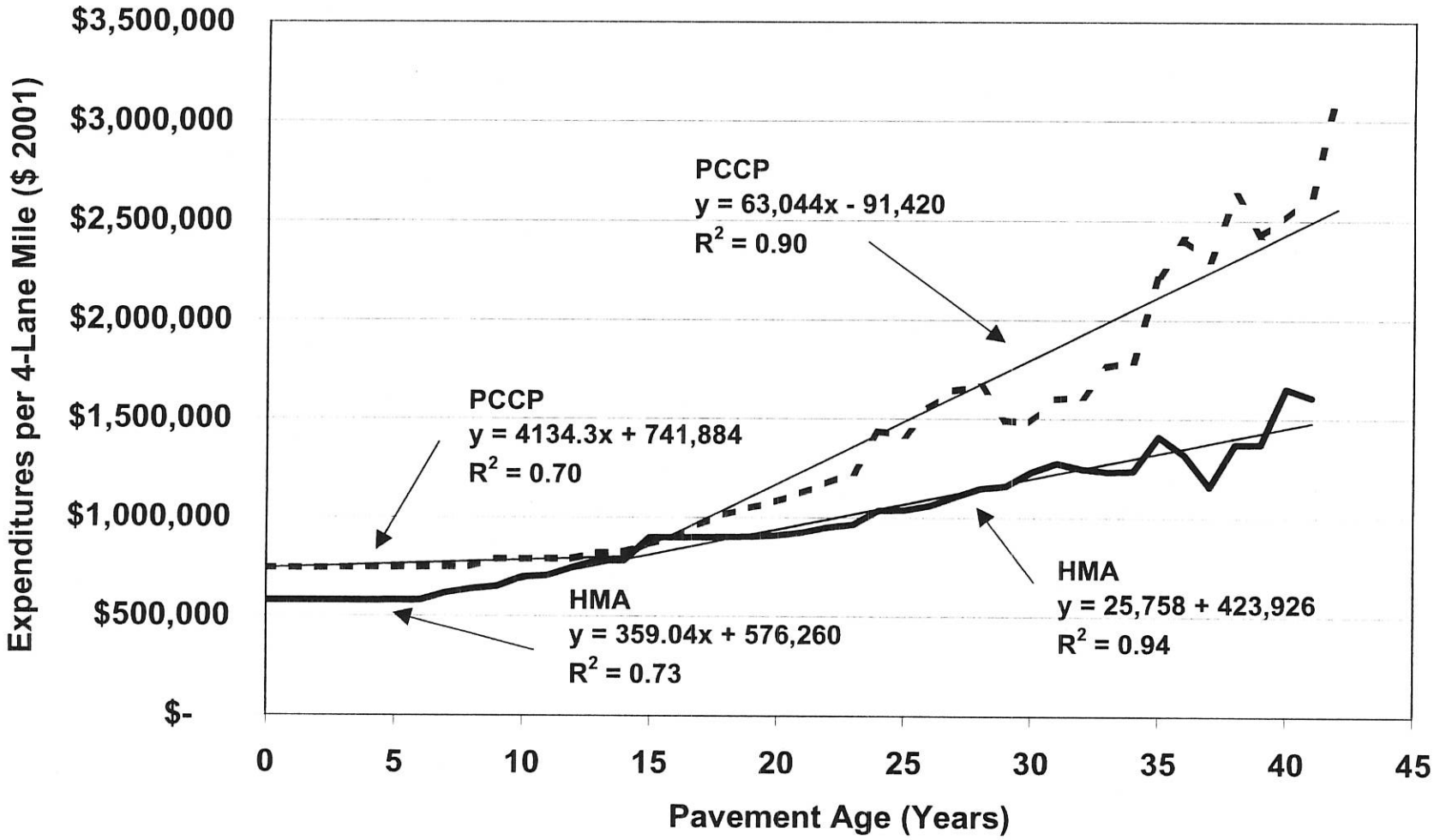


Figure 12. Regression Curves for Life-Cycle Cost Performance

years were 2.4 times higher for PCC pavements than HMA pavements, $63,000 per year per 4-lane mile compared to $26,000 per year per 4-lane mile for HMA.

The majority of the PCC pavement sections have been reconstructed. However, even assuming future maintenance expenditures revert to the earlier level of $4,000 per year for the PCC pavements and expenditures remain at the higher level of $26,000 per year for the HMA pavements, it would take 48 years for total expenditures to be equal. This assumes that all of the PCC pavement sections, including those that have not been reconstructed, will perform similar to a 0-14 year old pavement over the next 48 years and that the HMA sections will continue to require rehabilitation costs.

Pavement Performance

Life-cycle cost analysis requires input parameters of anticipated pavement performance. The FHWA recommends using reasonable assumptions of pavement performance based on past performance and cost histories. The performance and cost data obtained from this study was analyzed to provide recommendations for input parameters for life-cycle cost analysis. The analysis was performed using weighted averages per mile of pavement based on the 32 individual PCC pavement analysis sections and the 24 HMA pavement analysis sections.

Service Life

Service life is defined as number of years from original construction until a major treatment was required. Major treatments are defined as reconstruction or rehabilitation. Of the 218.9 miles of PCC pavement evaluated, 148.0 miles (68%) were reconstructed and 19.4 miles (9%) were rehabilitated (rubblization). Of the 261.8 miles of HMA evaluated, 192.3 miles (73%) were rehabilitated using HMA recycling and 27.4 miles

(10%) were rehabilitated using whitetopping. There were 23.4 miles of HMA pavement that were reconstructed and 10.2 miles of whitetopped pavement that were reconstructed in full depth PCC.

Figure 13 shows the percent of miles in service without reconstruction or rehabilitation, by year, for each pavement type. The performance lives of the two pavement types were very similar. The average service life in years, or the time until 50% of the miles of had undergone rehabilitation or reconstruction, were 33 years for the HMA pavement sections and 34 years for PCC sections. However, the costs were considerably different. Sixty-eight percent of the miles of PCC pavement were reconstructed at a cost of $2,037,000 per 4-lane mile and 9% were rehabilitated at a cost of $1,321,000 per 4-lane mile. The cost of reconstructing the 23.4 miles (9%) of HMA pavement was $1,815,000. Seventy-three percent of the miles of HMA pavement were rehabilitated using HMA recycling at a cost of $657,000 per 4-lane mile. The 27.4 miles (10%) of whitetopping cost $1,106,000 per 4-lane mile. Table 3 shows the original construction costs and reconstruction or rehabilitation costs by pavement type.

HMA Overlay

As previously discussed the HMA sections on I-70 were built using planned staged construction (PSC). However, it is generally agreed that a maintenance action was required at the time the PSC was placed. Figure 14 presents the percent of miles still in service, by pavement age, until the PSC and second HMA overlay were placed for HMA pavement sections and the first and second HMA overlays for PCC pavement sections. Fifty percent of the HMA miles received the first HMA overlay after 10 years with a

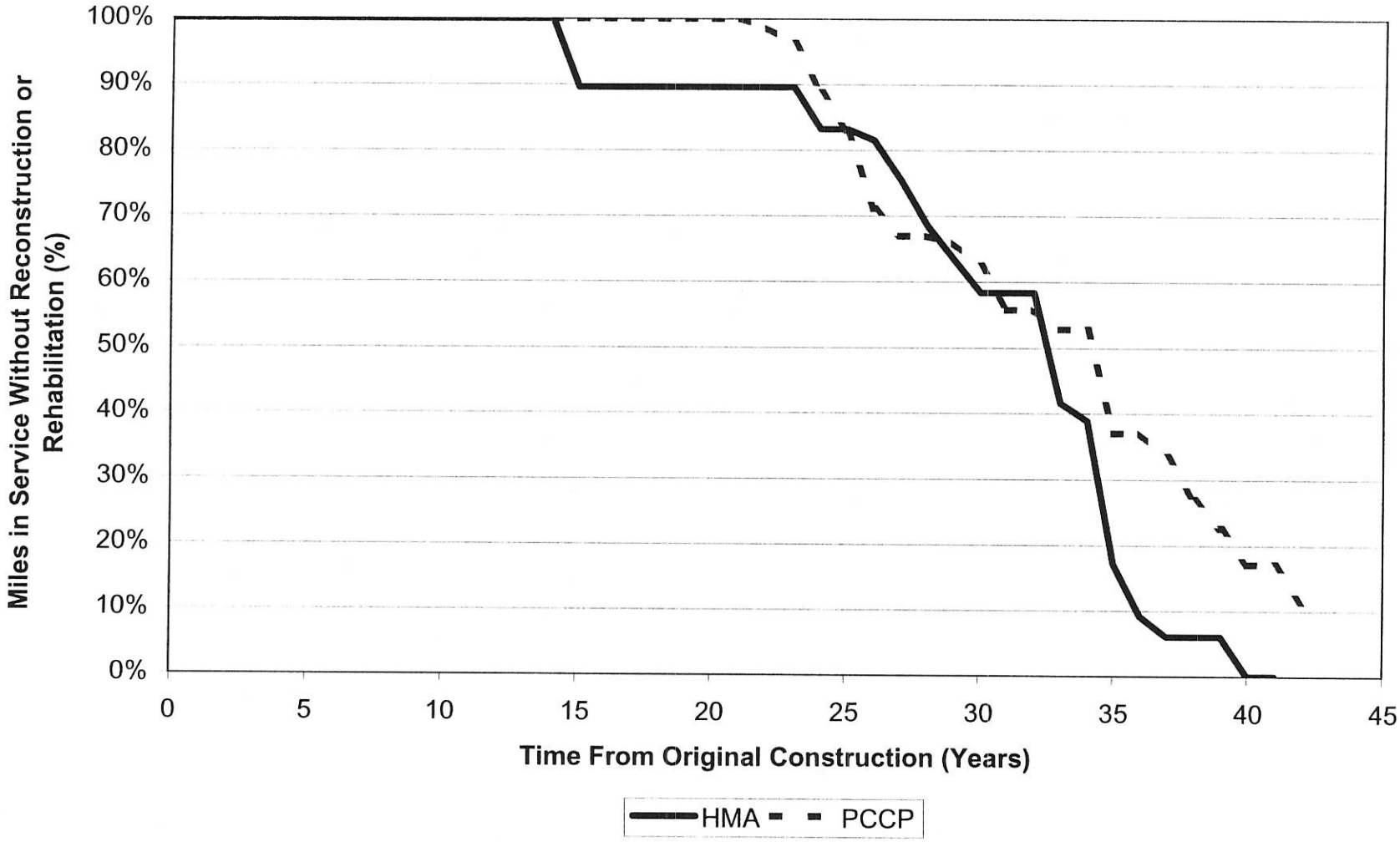


Figure 13. Performance History Curves for Service Life

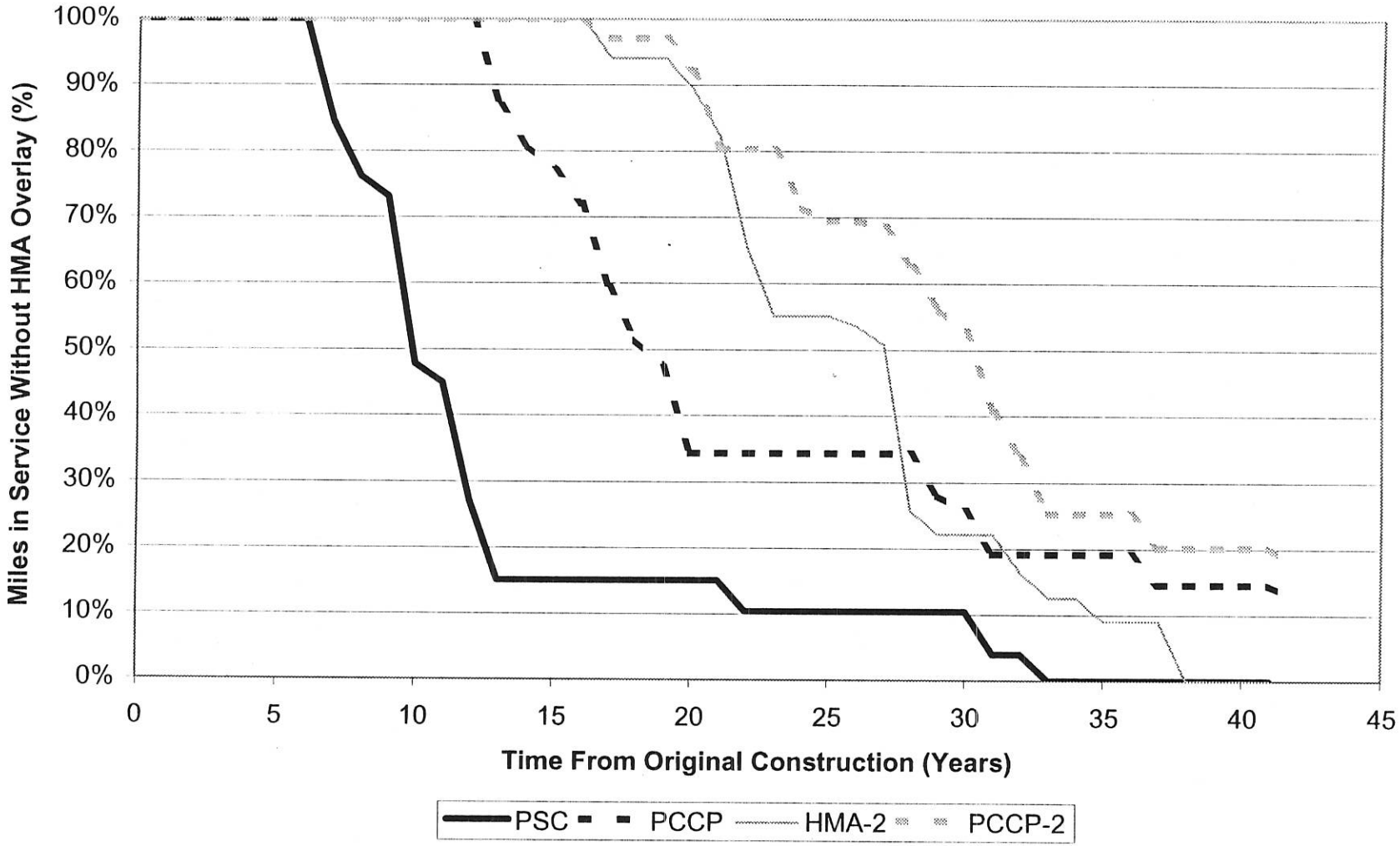


Figure 14. Performance History Curves for HMA Overlays

Table 3. Average Expenditures for Rural Interstate Pavements, 2001 Dollars

	HMA		PCC	
	Miles (%)	Cost	Miles (%)	Cost
Original Construction	100	$ 576,000	100	$ 742,000
Reconstruction	9*	$ 1,815,000*	68	$ 2,037,000
Rehabilitation				
HMA Recycling	73	$ 657,000		N/A
Whitetopping	10	$ 1,106,000		N/A
Rubblization		N/A	9	$ 1,321,000

N/A = Not Applicable * Full Depth HMA

range of seven to 13 years for the PSC on I-70, to a maximum of 22 years for Coffey County, which was not built using PSC. A second overlay was placed 27 years after original construction with a range of 17 to 37 years (not every section has received a second HMA overlay).

After 18 years, 50% of the PCC pavement sections had received an HMA overlay. The range was 13 to 42 years (not every section has received an HMA overlay). Fifty percent of the miles of PCC pavements received a second HMA overlay 31 years after original construction or 13 years after the first HMA overlay. The range was 17 to 42 years from original construction.

First Minor Maintenance Treatment

Minor maintenance treatments were differentiated from HMA overlays for this study. Minor maintenance treatments for PCC pavements consisted of mudjacking slabs, crack

RECOMMENDATIONS

Based on the results and limitations of this study, the following recommendations for pavement performance for use in life-cycle cost analysis in areas with similar materials and environment to Kansas are warranted. The recommendations are shown in table 4. Both pavement types were originally constructed using the best available materials, methods and procedures available at the time of construction. The major reported modes of pavement distress were thermal cracking for HMA pavements and joint deterioration due to D-cracking, faulting and spalling for PCC pavements. These distress mechanisms have been addressed by changes in material specifications, design procedures and construction methods. The recommendations shown in table 4 are based on past performance and should be considered conservative values for use in life-cycle cost analysis.

HMA Pavements

HMA pavements should last a minimum of 8-12 years past original construction without any maintenance. Pavements built utilizing planned staged construction typically received a planned overlay after 10 years. Seventeen years after original construction, seven years after the PSC, a seal or cold milling was typically performed. An HMA overlay was typically placed an average of 27 years after original construction. Rehabilitation on pavements with thermal cracking occurred after 33 years. Rehabilitation consisted of milling four inches, cold in-place recycling four inches and placing six inches of HMA.

Table 4. Recommended Input Parameters for Life-Cycle Cost Analysis in Kansas.

Treatment	Action	Treatment Life		
		Average	Maximum	Minimum
		(years)		
HMA Pavements				
1st	HMA Overlay	10	22	7
2nd	Seal	18	27	5
3rd	HMA Overlay	27	37	17
4th	Rehabilitation*	33	40	15
PCC Pavements				
1st	Seal / Patch	9	29	1
2nd	HMA Overlay	18	42	13
3rd	HMA Overlay	31	42	17
4th	Reconstruction	34	42	22

* Thermal cracked HMA pavements only.

PCC Pavements

The average time until the first minor maintenance treatment for a PCC pavement was nine years. After this time slab repair, consisting of patching, mudjacking or crack sealing was required. An HMA overlay was placed an average of 18 years after original construction followed by a second HMA overlay at 31 years. Complete reconstruction occurred, on average, after 34 years.

Thirty-five percent of the PCC pavements had a service life of less than 30 years and 63% had a service life of less than 35 years. None of the PCC pavements evaluated are expected to exceed a 45-year service life before complete reconstruction is required. Exceedingly long service lives for Kansas PCC pavements do not appear warranted.

Average yearly maintenance expenditures for PCC pavements during the first 15 years were slightly less than HMA pavements. During the next 25 years, yearly expenditures for PCC pavements were 2.4 times higher than HMA pavements. Historically, PCC pavements have required less maintenance than HMA pavements during the first 15 years but considerably more maintenance during the next 25 years. If long service lives are expected for PCC pavements, considerable maintenance cost during the last 25 years of the pavement's life should be considered.

Kansans for Cost Efficient Roadway Construction

P.O. Box 23023
Overland Park, KS 66283

March 12, 2002

Members of the House Transportation Committee

Re: Kansas Department of Transportation Pavement Surfacing Recommendations

Mr. Chairman Hayzlett, Members of the Committee:

My name is Butch Spray and I am a member of Kansans for Cost Efficient Road Construction, Inc. ("KCERC"). KCERC is a Kansas corporation that monitors and advocates concerns important to the asphalt paving industry in Kansas. KCERC asks that this Committee review the Kansas Department of Transportation's (KDOT) Pavement Surfacing Recommendations on Kansas highways and review the method used in pavement surfacing Life Cycle Cost Analysis.

Although there is no specific legislation that has been introduced to deal with these concerns, my clients would like for the Legislature to review KDOT's procedures concerning the matter.

In support of my testimony, I ask that you please accept the attached issue outline.

Respectfully submitted,

Orville (Butch) Spray

Attachment

Post Office Box 1486
South U.S. 281 Highway
Great Bend, Kansas 67530

GREAT BEND, KANSAS
ASPHALT
GRADING
CONCRETE

PHONE (620) 792-5921
FAX (620) 792-7155

NATIONAL ASPHALT PAVEMENT ASSOCIATION
KAPA
Kansas Asphalt Pavement Association

1. The 1989 Comprehensive Highway Program, with the system enhancements, was completed on time and within budget.

2. The 1999 Comprehensive Transportation Program, with reduced funding and cost overruns is in serious trouble... The beginning of a broken promise to the people of Kansas.

   a. The governor and legislature has reduced funding for the C.T.P. by approx. 121 million to date.
      1. Current proposals indicate an additional 151 million to be removed.
      2. There has been a 231 million decrease in maintenance
         a. 183 million from substantial maintenance (thin overlays). This indicates reduced maintenance on many highways, which will lead to deterioration.

   b. An additional 277 million in bonding has been authorized to replace 160 million Sales Tax Tranfers.
      1. This adds to a debt service, which totally, could consume 1/3 of revenues available for construction and maintenance in a Post-C.T.P. environment.

   c. The funding distribution of the system enhancements portion of the C.T.P. was extremely questionable.
      1. Large amounts of dollars were concentrated in a limited number of projects, leaving many communities with unfulfilled needs.
      2. The recent elimination and/or downscoping of previously selected System Enhancement projects, after communities generated local matching funds is unconscionable.

Post Office Box 1486
South U.S. 281 Highway
Great Bend, Kansas 67530

PHONE (620) 792-5921
FAX (620) 792-7155

d. Major Modifications (larger projects) and Priority Bridge Projects have overrun approx. 425 million in 3 years or less (approx. 17% overrun per year).

3. We believe the 1999 C.T.P. is in trouble and could survive if the volume of Asphalt Pavement was in the same proportion to Concrete Pavement as the 1989 C.H.P.
   a. Thru the 1989 C.H.P., the volume of Asphaltic Pavement, in dollars, was two to three times that of Concrete Pavement. In the 1999 C.T.P. this ratio is reversed.
      1. The current "Life Cycle Costing Analysis" used by the KDOT favors the more expensive Concrete Pavement.
      2. Professor Steve Cross's study of Rural Interstates showing Concrete Pavement cost 1 ½ to 3 times more to build and maintain as Asphalt Paving.
      3. Many Highways carrying existing traffic have an asphalt thickness of 6 to 10 inches. These highways are being re-designed for reconstruction with a thickness of 13 to 19 inches, thus increasing the cost greater than Concrete Pavement.
      4. The new Asphalt Mixes "Super-Pave" are given no consideration for their increase strength and durability. (Only their additional cost is included)

   b. Existing Asphalt Pavements are being reconstructed with the more expensive Concrete Pavement.
      1. Many U.S. and K Routes (Non-Interstate) which have always been Asphalt Pavement are being reconstructed with the more expensive Concrete Pavement (US 56/77 Marion Co., K-150 Marion Co., K-150 Chase Co., US 169 Miami Co. and US 40 Logan Co.)

Post Office Box 1486
South U.S. 281 Highway
Great Bend, Kansas 67530

VENTURE CORPORATION
GREAT BEND, KANSAS
ASPHALT GRADING CONCRETE
PHONE (620) 792-5921
FAX (620) 792-7155

NAPA
NATIONAL ASPHALT PAVEMENT ASSOCIATION
KAPA
Kansas Asphalt Pavement Association

2. The KDOT rules indicate all "C" Routes be not less than 10 inches of Concrete Pavement. The design of US 56/77 (a "C" Route) was only 8", thus allowing the "Life Cycle Costing Analysis" to be lessor with Concrete Pavement. (US 56/77 Marion Co.)
3. Adjacent to an existing Asphalt 2 lane highway, two new lanes were added to make a four lane. The "Life Cycle Costing Analysis" was within 5% ±. A KDOT lead design engineer stated "We are advancing reconstruction and rehabilitation with Asphalt Paving..... . This recommendation will be very unpopular in many parts of the KDOT, however.... combined estimate initial cost savings...is 14,810,000.00". The KDOT decided to use concrete pavement. (US 169)

c. Plan to cut 147 million from Transportation Plan (Announcement December 14, 2001)
   1. Seven Major Modification Projects were cut. Six were Asphalt Paving. One apparently with undetermined surfacing.
      a. two of the projects were on I-35 in Coffey County. [In the 1999 C.T.P. approx. 51.4 miles of I-35 (Emporia to Kansas City) was to be reconstructed. The design was entirely with Concrete Pavement at an average cost of 3.831 million/mile. The KDOT was convinced to re-habituate a existing 11.9 mile section of Asphalt Pavement with Asphalt Pavement. ($719,000.00 per mile.) This reduced the cost of this 11.9 mile section from $36,066,000.00 to $8,555,000.00. (A 77% cost reduction)]
      These two projects were removed with the December 14th announcement. The remaining 8 Concrete Projects (at 3.8 million/mile) remain in the program.

Post Office Box 1486
South U.S. 281 Highway
Great Bend, Kansas 67530

GREAT BEND, KANSAS
ASPHALT GRADING CONCRETE
VENTURE CORPORATION

PHONE (620) 792-5921
FAX (620) 792-7155

NATIONAL ASPHALT PAVEMENT ASSOCIATION
KAPA
Kansas Asphalt Pavement Association

b. Within a few days of the above announcement a 40 ± mile project which is a composite pavement (Both Asphalt & Concrete) was determined to be reconstructed entirely out of Concrete Pavement.

d. Pre 2000, the volume of Concrete Pavement constructed by Out-Of State Contractors was approx. 14%. Asphalt Pavement was 5.6%. In 2000 approx. 24% and 2001 33% of the Concrete Pavement went to Out-Of State Contractors. (approx. 89 million) Asphalt Pavement was approx. 4.2%. (approx. 6 million)

Sincerely,
VENTURE CORPORATION

Orville (Butch) Spray
Chairman of the Board

Kansans for Cost Efficient Roadway Construction
P.O. Box 23023
Overland Park, KS 66283

March 12, 2002

Members of the House Transportation Committee

Re: Kansas Department of Transportation Pavement Surfacing Recommendations

Mr. Chairman Hayzlett, Members of the Committee:

My name is Tom Ritchie and I am a member of Kansans for Cost Efficient Road Construction, Inc. ("KCERC"). KCERC is a Kansas corporation that monitors and advocates concerns important to the asphalt paving industry in Kansas. KCERC asks that this Committee review the Kansas Department of Transportation's (KDOT) Pavement Surfacing Recommendations on Kansas highways and review the method used in pavement surfacing Life Cycle Cost Analysis.

Although there is no specific legislation that has been introduced to deal with these concerns, my clients would like for the Legislature to review KDOT's procedures concerning the matter.

In support of my testimony, I ask that you please accept the attached letter.

Respectfully submitted,

Tom Ritchie

Attachment

House Transportation Committee
March 13, 2002
Attachment 6

March 8, 2002

I am writing to express my grave concern about the future of the 1999 Kansas Comprehensive Transportation Plan. There are two separate but closely related issues at hand. The first relates to funding of the 1999 program in this time of economic downturn. The second relates to what I believe is an extremely poor use of available highway funds themselves because of an unwise pavement surfacing selection process that has been adopted by KDOT in recent years.

First the funding issue. Based solely on the promises made by the Kansas legislature in 1999 to undertake a 10-year Comprehensive Transportation Program, my company and others have made substantial investments in both equipment and employee training so that we could meet the challenges of performing the work plan outlined in the 1999 program. Current indications are that future funding of the 1999 program will be gutted far beyond the substantial reductions that have already occurred since its inception. If this happens, not only is the status of my employees' continued employment at risk but it will be a very remote situation indeed for my firm (and many other industries as well) to make future investments in Kansas based upon the promises that are not being kept. I urge you to strongly support full funding of the Comprehensive Transportation Program as promised by a wide majority of the legislature back in 1999 even if it requires a substantial user fee increase!

Now the second issue. As a licensed professional engineer who owns a construction firm that constructs both concrete and asphalt pavements for KDOT and other jurisdictions all over Kansas, it concerns me greatly that KDOT has, in recent years, begun specifying a much greater portion of projects with much more costly concrete pavement. As a direct result, KDOT expenditures to date for the projects itemized in the 1999 program are over budget by approximately 17%! What an incredibly poor time to blow the opportunity to maintain what was once widespread support by greatly shrinking the number of projects that the original budget would have funded. As I mentioned, my firm does both types of pavements and I am quite certain that the citizens of Kansas are receiving no added value for these cost overruns.

KDOT will tell you that it is using "life cycle cost analysis" approved by AASHTO (American Association of State Highway Transportation Officials). This is correct. However, the version of life-cycle analysis used by KDOT was approved by AASHTO in 1993 and was only a rewrite of the original 1956 program. It is way out of date. FHWA did a major update SA-98-079, of its life-cycle cost analysis design guide in 1998. It is available now and is based on a much larger body of knowledge than the one currently used by KDOT. Kansas should be using this version rather than a rewrite of a 1956 dinosaur!

It is important to note that the life-cycle cost analysis process depends upon making assumptions about many items over the full life of each pavement design being considered. To be

comparable, FHWA recommends that the minimum pavement lifespan selected be sufficiently long that all pavement alternatives will have gone through a major rehabilitation or reconstruction. The process also requires a complete maintenance program to be determined for each pavement alternative.

There are several major flaws in KDOT's application of the life-cycle cost analysis. First, KDOT selects a pavement life that literally stops just short of the time the concrete pavement alternate will require complete reconstruction thereby deleting this major expense from the analysis. Furthermore, in several of KDOT's life-cycle cost analyses examined by Professor Steve Cross of the University of Kansas, it was found that the maintenance programs selected for asphalt pavements far exceed any which have been required or done in the past by KDOT. Needless to say, these two variances dramatically alter the outcome of KDOT's life-cycle analysis! It smacks of modifying the assumptions so as to justify a preconceived outcome. I don't think this is appropriate and I hope that you will investigate what has occurred!

Our state is facing an economic crisis. I have nearly 800 employees in Kansas whose livelihood depends on your keeping the promise that the legislature made to the citizens of Kansas back in 1999. We need full funding of the 1999 Kansas Comprehensive Transportation Program and we need to spend that funding wisely. We need the jobs that this program will provide – not the layoffs that will result from the failure to deliver on what was promised! Past Kansas highway programs have been proven to provide both jobs and direct economic stimulus with 2.5 times the investment in highways being returned directly to the Kansas economy. This state has benefited from several years of tax cuts and now it is time to restore some of those taxes – hopefully in the form of transportation use fees in order to avoid further degradation of our Kansas economy.

Very truly yours,

Tom Ritchie, PE
CEO Ritchie Companies, Inc.
Wichita, KS

dlb

27707 / 56833
CHITE 167818