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Public Perceptions of the Midwest's Pavements: Policies and Tradeoffs in Pavement Improvement

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Abstract

With the budget crisis plaguing so many states, pavement management will compete more vigorously for limited funds. Findings reported from a tri-state pooled-fund research project provide insights and guidelines for pavement improvement derived from the perceptions of the driving public. The Phase II responses from statewide surveys in Iowa, Minnesota, and Wisconsin address the topics of perceptions of the State Departments of Transportation (DOTs), pavement repair tradeoffs, and pavement evaluation. The results disclose specific public perceptions of priorities for spending limited highway funds. Implications for pavement management, policy, planning, as well as for marketing to garner additional funds are explored.

The study of public perceptions of pavements dates to the American Association of State Highway Officials (AASHO) road tests in the 1950s (Highway Research Board [HRB], 1962). Pavement sections evaluated subjectively by a rating panel in Illinois were compared with objective ratings from a profilometer. Later studies by the Colorado Department of Highways (Arterburn & Suprenant, 1990), the Indiana Department of Transportation (Indiana DOT, 1993), and the Wisconsin DOT (Garg, Horowitz, & Ross, 1988) focused primarily on pavement indices and the perceived need for improvement (Giese, Griffin, & Kuemmel, 2001). In assessing pavement management research through 1995, Khisty and Leleur (1997) concluded that being "weak in public participation" was contributing to "increased criticism of current-day planning practice." In 1996, the Federal Highway Administration (FHWA) published the results of its survey of public satisfaction with the nation's highway system (Coopers & Lybrand, 1996). The telephone survey was the first nationwide (N = 2,200 drivers); response data indicated that 50% of the sample was satisfied overall with U.S. highways while 16% were dissatisfied. This step in the direction of "a major research effort to define, truly and comprehensively, client acceptance and preferences" called for by Haas and Hudson (1996, p. 9). It did not address, however, specific public perceptions and preferences with regard to DOT capability and pavement improvement priorities.

Current Context

The climate facing state DOTs during economic slowdowns, such as that occurring during most of 2002 and 2003, dealt a painful budget crunch. One would think that DOTs would want to be sensitive to public input, especially if the public is more vocal about state highway needs and expectations. Particularly salient would be situations in which the state's pavement replacement criteria are above what the public expects or needs. Thus the agencies' perceptions more than likely (if based on the American Association of State Highway and Transportation Officials [AASHTO] criteria from the 1950s) would be different than the public's. More significant, however, the agency's funding relies on the public and ought to be interested in what citizens believe.

One could easily say the public does not really understand when it is the proper time to improve a highway. The measures DOTs use, dating back to the AASHO road tests in the 1950s, derive from public input, albeit limited. Some states provide higher standards for rural two-lane highway pavements than what the public desires. This raises a fundamental question. Would the same conclusions be obtained today if the research were repeated? We believe they would; frequent reconstruction and delays, particularly on the interstate system, drive home the fact that our pavements do not last very long, especially those that are driven most heavily. Steadily growing congestion, moreover, exacerbates the problem.

The current project involving three studies of midwestern states closely fits the above scenario. All three states face funding shortfalls that directly affect pavement management. In terms of pavement replacement, citizens in all three states want things done differently and more rapidly. The desired outcomes will undoubtedly cost more money. Little has changed vis-à-vis the findings of the current comprehensive study, at least to our knowledge.

State DOTs can effectively use marketing research as a tool. Unfortunately, necessary major pavement policy changes still remain elusive. This article intends to encourage the desired changes in the process used to decide on pavement replacement, giving particular attention to the value of increased systematic marketing research for the purpose of resolving key replacement tradeoffs that confront DOT decision makers.

The current tri-state pavement management project stemmed from a Wisconsin DOT initiative to expand the study of public perceptions of state pavements. Minnesota shared in the desire to conduct more comprehensive research to guide decision making on pavement improvement. The primary objective of the pooled-fund research sought customer input to improve state DOT pavement policy and planning efforts.

Research Design

Phases of Research

A three-phase study started in 1996. Phase I (focus groups) began in the second half of 1996. Phase II (statewide) surveys were conducted in the last half of 1997, and Phase III (targeted) surveys began in the second half of 1999. The project was executed as independent studies in each of the three states, with separate reports for each phase. The University of Wisconsin Survey Research Lab (WSRL) performed all survey work in all three phases. A Marquette University multidisciplinary team included expertise in psychology, statistics, communications research, marketing, and pavement management.

Phase I: Focus groups

To gain insight into the public's perceptions of and priorities for the Midwest's rural, two-lane highways (referred to as RTLH), the team selected the qualitative research technique of focus groups. Cost-effective focus groups yield information vital to the formulation of quantitative survey questionnaires. Because regional differences in perceptions of RTLH were sought, a total of six focus groups were held in various regions in each state. Focus groups ranged in size from 5 to 12 participants. Eight was the optimal number to ensure balance across driver types and to allow all participants an opportunity to provide input in the limited time frame. In selected regions, one half of the participants were asked to drive a designated stretch of highway first. Compensation was U.S. $50 for drivers and U.S. $35 for nondrivers. The total number of focus group members was 162 across the three states.

Moderators of focus groups followed a script that progressed from broader questions to more specific evaluations of selected issues. To begin, participants were asked to visualize themselves driving down a stretch of RTLH. The standard protocol included:

- a general discussion of pavement features participants liked or disliked
- a series of questions requesting participants to choose between difficult options of pavement improvement
- a ranking exercise in which participants as a group decided the priorities of road repair factors.

The protocol was modified after the first three focus groups to improve pavement terminology (ruts, grooves, tining, etc.). Added at the outset was an explanation to improve comprehension of pavement terms.

Also early in the process, focus group moderators and the team got a clear idea that highway segments would be more difficult to identify than anticipated. Between two cities some segments were not rural and marked state highways. (Participants did not always know the difference between county marked highways and numbered state highways). Segments were long with many using local landmarks to identify segment starts and/or ends; these landmarks were not in the state database.

Although participants in all focus groups had a reasonable understanding of pavement defects, they employed a variety of verbal and nonverbal means to describe them. Focus group members were hard pressed to describe preferences. Instead they highlighted the absence of defects or offered an all-inclusive list of defects, for example, patching, bumps, and inadequate shoulders. Of minor concern to participants were noise and appearance of pavements.

When the focus groups progressed to prioritizing pavement improvements, participants were asked to choose between lists of difficult forced-choice options. They sought to determine how different factors should be weighed in setting priorities. The issues included the frequency of repairs, life of pavements, and building longer lasting highways. Some participants were skeptical about government efficiency and seemed to lack trust in governmental institutions. Focus group members generally believed in safety ahead of noise concerns. Many could not imagine a highway that was patched and rode well; however, most felt that resurfacing should occur only when the ride quality deteriorated.

The survey firm (WSRL) believed that participants who drove highway stretches before the focus groups did not improve their ability to recall specific conditions as much as the research team had anticipated. Although the cost was only a few hundred dollars, this drive-recall method (in Phase III) was exactly the strategy used. It worked very well. In tradeoff exercises, discussion often compared the relative benefits and costs of highway improvements. Overall, participants felt good roads should have a high priority and were willing to pay for improvements provided funds were used efficiently and equitably. More interesting, participants in all three states thought that their geographic area received less attention than the remainder of their state.

Phase II: Statewide surveys

The results of the focus groups yielded a wealth of information to guide the design of the subsequent statewide survey. The telephone survey in Phase II intended to assess perceptions and opinions about improvements in RTLH, to gauge levels of satisfaction, and to determine differences in these levels across specific response items. Approximately 30 staff and researchers contributed to the final design of the survey instrument. The instrument included 90 questions and relevant explanations. Survey copies and details of methodology, available from

each state DOT, are included in the Phase II report for each state (Marquette University Center for Highway and Traffic Engineering, 1998, 1999a, 1999b). All final and summary reports are available under Publications at http://CHTE.marquette.edu. Participants were not compensated for responding to the survey, which averaged 25 minutes for completion. In this phase, the WSRL team did not feel compensation was necessary because participants were not driving the segments first. This conclusion proved to be reasonable.

Phase II provided the foundation and framework for the Phase III surveys, which developed thresholds of pavement indices for the purpose of predicting the public's satisfaction and determining timing for pavement improvement (Phase III findings in Kuemmel, Robinson, Sonntag, Griffin, & Giese, 2001). Because Phase II yielded the most response data relevant to the practice and policies of pavement management, this article will focus on selected findings from Phase II.

Sample Demographics

Respondent profile data for Minnesota are presented in Table 1. Profile data for Iowa and Wisconsin were quite similar. A majority of the respondents to the statewide surveys in all three states were men. Age distribution was approximately one third for each of the three age ranges. Education percentages were virtually the same for Wisconsin and Minnesota; Iowa had 47.4% with high school or less and 22.5% college graduates. Although the distribution of the vehicle license was similar for Iowa, Wisconsin's percentages were slightly lower for commercial vehicles and motorcycles. In summary, respondent profile data were largely similar across the three states.

Survey Findings

Results of the statewide surveys will be discussed in relation to four major categories: (a) drivers' perceptions of state DOTs, (b) satisfaction with RTLH pavement, (c) tradeoffs for pavement improvement, and (d) opinions on construction delays.

Respondents' Perceptions of State DOT

A primary topic of investigation was the influence that drivers' perceptions of the state DOT might have on overall satisfaction with pavements and related improvements. The Likert-type scale items and drivers' agreement percentages for the three states are presented in Table 2.The drivers' responses had a margin of error of +/-5%. What should be noted initially is the consistency in responses across the three states. Not only is it confirmatory but also

meaningful in subsequent interpretation of survey results.

More than three fourths (from 77% to 83%) of the respondents strongly agreed or agreed that their DOT is capable of doing a good job of pavement maintenance. As to trust in the DOT's judgment, a clear majority (58% to 64%) responded affirmatively. Approximately three fourths (74% to 78%) agreed that their DOT officials care about their safety and convenience. Finally, although less than one half (38% to 43%) affirmed that their DOT considers their input, respondents may well have not lived near the specific stretch of highway selected. In addition, only about one fifth of the drivers disagreed with this item. The responses concluded that drivers' perceptions of their respective DOT were primarily positive.

Pavement Evaluation

To evaluate the quality of a self-selected section of RTLH on which they drove regularly, respondents considered three specific statements. Included in their evaluation were overall satisfaction, perceived need for improvement, and comparison of their section with other sections of state highway they had driven recently. The response distributions across the three states closely aligned for the first two questions. For each state, just more than 75% of the respondents were satisfied (strongly agreed or agreed) with the pavement on the highway section that they normally drove. This level of satisfaction is a primary measure of evaluation that frames the discussion of subsequent responses. It should be noted that thresholds of improvement intend to convince the public that the DOT is doing a good job. With 75% approval, other responses came primarily from satisfied citizens. Less than one half (approximately 39%) of the drivers believed that the pavement on their designated highway section should be improved. Although this may seem inconsistent with the general satisfaction registered in the preceding item, it could be viewed in the normative sense of improvements desired if funds became available. For the third evaluation item, the comparison of highway sections, Minnesota's responses diverged. Iowa and Wisconsin had an identical 54%, perceiving the pavement on their highway section to be better than on most other sections. They also used pavement condition indices that can be compared very closely. For the same response category, Minnesota had 36%, suggesting that perceived pavement quality on their section was lower. Contrary to Iowa and Wisconsin, Minnesota had a generally better RTLH quality; higher expectations of the sample of Minnesota drivers should, therefore, be considered in any interpretation of the findings.

Pavement Improvement Tradeoffs

The statewide survey also included a series of questions addressing tradeoffs in pavement improvement on RTLH. In terms of pavement planning and management in the three states, these particular questions had a high priority. Serving as an introduction to the tradeoffs, three questions focused on perceptions of pavement improvement potential in each state. Drivers were first asked whether it is possible to build longer lasting pavements in their state. More than 80% of the drivers across the three states (82.7% average) responded affirmatively. A second normative question, whether pavements should be built to last longer, yielded over a 95% affirmative response (96.5% average) in each state. To gauge commitment, a third item queried: Would respondents still want pavements to be built to last, if they knew that it would cost more to build pavements to last longer? Notably, most of the respondents in the three states (94.6% average) answered to the affirmative.

The tradeoff questions covered a range of repair options. Following on the cost issue, drivers first were asked whether the cost of building longer lasting pavements should be paid for by raising more funds or by delaying some repairs on other pavements and tolerating a poorer ride on those pavements until funds were available. Almost three fourths of the respondents across the three states (74.1% average) chose the first option, raising more funds. Table 3 presents the specific choices for subsequent tradeoff items, with relevant response averages for the three states. A set of three questions addressed particular repair tradeoffs. First offered was a choice between resurfacing pavements every 10 to 12 years with frequent short construction delays and resurfacing every 18 to 20 years, with knowledge of potential for pavements to be in poorer condition toward the end of that period. Although 81.5% opted for 10 to 12 years, it should be noted that the issue of wording a response required corroboration of this finding (in at least one state) in Phase III research, that is, 80% again chose the option of 10 to 12 years when consequences were comparable.

In the second query, respondents chose between repair of a 10-mile stretch of RTLH for each of the next 3 years with shorter delays and repairing all 30 miles, tolerating one longer period of delays. Almost two thirds (62.9% average) selected the second option. Finally, the project design offered a choice between construction requiring a 2-month 30-minute detour and repair requiring a 10-minute delay, no detour but duration up to 6 months. A majority of the respondents (59.9% average) selected the latter option. In summary, respondents preferred more frequent pavement repairs and shorter delays.

A series of four open-ended questions next addressed the acceptability of travel time and speed limits within the construction zone. Response averages are shown in Table 3. It should be added that RTLH in the three states have 55 mph speed limits. Almost two thirds of the drivers

(65.9% average) considered 20 to 25 minutes as a reasonable time to travel a stretch of 10 miles under construction. More interesting, almost one half (45.1% average) judged 25 to 30 minutes as unacceptable. Approximately one half of the respondents (51.6% average) indicated that a reasonable speed limit through the 10-mile work zone would be in the range of 31 to 40 mph, given a 55 mph normal limit. Finally, one half of the drivers (49.5% average) perceived speed limits in the work zone of 25 mph or less unacceptable.

Customer feedback on priorities for pavement improvement was high on the list of desired results for all three state DOTs. A capstone question to the tradeoff section, therefore, asked respondents to select only one option as to how they would spend a limited amount of funds on pavement repairs for a stretch of RTLH from a list of five options. Response averages from highest to lowest frequencies were the following:

Option	*Response (Average %)*
Build longer-lasting pavement	53.6
Fix bumpy pavement	24.6
Resurface patched pavement	10.5
Reduce construction delay	5.7
Correct noisy pavement	1.7

In summary, responses to the tradeoff questions revealed key findings. In all three states, drivers indicated that pavements should be built to last longer and that the drivers would bear those higher costs. In terms of construction tradeoffs, respondents preferred more frequent pavement repairs and fewer delays altogether. Findings were consistent across the three states and reflected a clear desire for longer lasting pavement.

DOT Perceptions, Pavement Satisfaction, and Tradeoffs: Key Relationships

As already noted, satisfaction with pavement logically would be related to perceptions of the specific organization responsible for pavement maintenance. Although citizens may not know exactly who is responsible, other questions about the state DOTs confirm that one could logically conclude the state DOTs are responsible for state highways. Smith and McWaters (1995) indicated that the public's evaluation of pavement quality could be influenced by their perception of attention to pavement smoothness. The current research includes tests to determine whether pavement satisfaction was significantly related to respondents' perceptions of their respective state DOT. Cross-tabulations used a chi-square test of significance with a 95% confidence level. The Spearman correlation coefficient (SCC) calculates the strength of specific relationships.

Unlike some correlations, the Spearman correlation between one set of variables has the ability to compare to that of any other set. The coefficient usually ranges from -1 to +1. The SCC is particularly appropriate for the 5-point Likert-type scale (which is noncontinuous and ordinal) that was used for much of the statewide survey. The SCC computation process yielded statistically significant relationships between the satisfaction and perception questions. Table 4 highlights the four questions as well as key relationships.

The overall analysis produced SCC ranges that would be characterized as medium-level correlation. However, the findings are largely confirmatory in the particular direction of the relationships, thus, the focus on + and -. As Table 4 shows, the only correlation that was not significant was the relationship between perceived capability of Wisconsin DOT and Wisconsin drivers' comparative evaluation of their section versus other pavement sections. For all three states, however, significant positive relationships between the four items perceived the state DOT and respondents' satisfaction with their section of pavement.

Moreover, the four DOT perception items were negatively related to respondents' answers. This expected result indicates a perceived need for improvement of their pavement section. In contrast, positive relationships would be anticipated between the four perception items and comparative evaluation of respondents' sections of pavement. In sum, the nature of the relationships between responses to the DOT perception items and those for pavement evaluation was a logical outcome with implications for pavement planning and management.

Although the tradeoff questions did not fare as well as perceptions of the state DOT in significant relationships, several were worth noting. As before, these relationships were significant at a 95% confidence level or better. On one hand, with regard to demographics, female respondents were more likely to select raising more funds than delaying construction to pay for building longer lasting pavement. On the other hand, male drivers were more likely to opt for a better ride on heavily traveled sections of pavement rather than an equally smooth ride on all sections.

In terms of the construction options, when states need to rebuild a 30-mile stretch and to spread work around, they frequently repair a 10-mile stretch in each of three consecutive years to spread work around. For the question options (Table 3), therefore, we added the 10-mile stretch to the one 30-mile stretch option. Our purpose was to ask whether the respondents would want all 30 miles repaired at once, knowing that it would require a longer period of delay. With this in mind, our focus turns to two of the items on DOT perceptions that played a significant role in the findings. Respondents who agreed that their DOT cares about their needs and considers drivers' input chose to (a) raise more funds rather than delay construction and (b) tolerate a

longer period of delays in repairing a 30-mile stretch of RTLH. These are reasonable results for the positive perceptions.

Pavement Management Implications and Conclusions

A tri-state research project of this magnitude should make substantive contributions not only to pavement management but also to policy and planning dimensions of DOT operations. Wisconsin DOT, in particular, incorporated project findings into its Pavement Management Decision Support System as it applies to RTLH (Robinson, Kuemmel, Sonntag, Shober, & Griffin, 2000). Given so many states confront budgetary crises, such research efforts could potentially enhance pavement repair project design and required fund allocation. A recent article in this journal provided logical reasons for raising gasoline taxes (Wachs, 2003). Among these were insufficient new highway capacity to handle escalating congestion, the cost of roads outpacing revenue generation, and incentives to encourage behavior toward efficient use of the transportation system. Projects similar to the current research could contribute to cost-efficient pavement repair and to heightened awareness of the inextricable linkage between state DOTs and their customers on behalf of garnering financial and political support for pavement improvement.

This ongoing relationship also generates implications for planning and policy formulation. To clarify specific pavement improvements for planning, the state DOTs in the current project recognized the need to include tradeoff questions in the statewide surveys. Tradeoffs are always necessary when funds are inadequate. The responses yielded spending priorities given limited funds for pavement improvement on RTLH. They also provided parameters for the timing of pavement repair projects and associated delays. From a policy standpoint, surveying the driving public clearly delivers valued dividends for DOTs. The tri-state project specifically demonstrated that drivers sampled strongly believe that the three states can and should build longer lasting pavements. Of special significance, drivers across the three states responded that they would be willing to pay for such improvements. However, at that time, state DOT research staff did not want to ask how much increased gas tax the public would accept. For future research, this amount would be a logical addition.

For government agencies, policy and image inevitably overlap. The statewide surveys offered the state DOTs encouraging feedback as to how they were perceived by their customers. A majority of the sampled drivers responded that the state DOT was capable of doing a good job in pavement repair, they trusted DOT judgment on pavement improvement, and DOT officials cared about their needs. The majority, however, did not perceive that the state DOT considered

drivers' input when they made decisions about pavement improvement. We would emphasize that the current tri-state research project (yielding useful findings from all three phases) is a proactive step to reduce this perceived gap in policy input and customer relations.

Gaining the trust and input of the driving public has become increasingly crucial as funds allocable to pavement improvement have eroded because of inflation and construction costs outpacing increases in gasoline taxes. As of September 19, 2003, the Wisconsin state legislature proposed to rescind its annual automatic gas tax indexing. Herein marketing plays a key role. The tri-state project involved marketing input from research design through report provision. The focus groups and the statewide surveys reflected a solid marketing research foundation. The three state DOTs should also take advantage of marketing strategy in promoting highway programs amid a more difficult fund-raising climate. From the encouraging responses to the perception questions, in particular, these agencies should subsequently build on the perceived trust to strengthen their marketing efforts. Other DOTs could pursue similar efforts. In this difficult era of politicians and other officials disassociating themselves from tax hikes, for example, gasoline taxes, DOTs (with the approval, either overt or covert, of their CEOs) become key advocates for increased funding for pavement improvement.

Actions on all of these fronts will contribute to more-efficient pavement management. The findings on drivers' willingness to support the construction of longer lasting pavements point the way for other state DOTs to follow suit in customer research projects. From the tri-state study, the three DOTs have acquired a valuable perspective on pavement repair from the driver's viewpoint. Emanating from the findings will be guidelines for more cost-efficient pavement improvement. (Final state reports for all three phases, with full questionnaires appended, are available under Publications at http://trc.marquette.edu.) State DOTs, through association-sponsored information exchanges and other forums, have an opportunity to share customer research findings and implementation specifics on pavement management and planning. It is recommended, however, that other states first survey their drivers to develop insights to guide interpretation of the findings from the current tri-state study.

Given the irrevocable trend toward partnering between organizations to manage budget shortfalls, state DOTs should rethink their strategies. By partnering with the customers they are charged to serve, these agencies could realize key benefits. Through well-directed research, they could gain considerable insight into drivers' concerns and priorities as to pavement improvement. Their heightened customer orientation would put them in a much more favorable light for gaining support for mutually desired pavement repair projects. To reiterate, it is high time that state DOTs adopt their role as key advocates in raising funds for specific objectives in

pavement improvement. Expanded customer input, moreover, could facilitate cost savings from streamlined repair efforts. Negative byproducts, that is, drivers' complaints on speed limits, delays, and so on, could be minimized by increased customer focus up front in project planning and design. State DOTs, in conclusion, need to recognize the shared commitment that they have to satisfy their customers through cost-effective, driver-focused pavement management.

Notes

- We acknowledge the much-appreciated support of the state Departments of Transportation of Iowa, Minnesota, and Wisconsin. Article content, however, is solely ours.

- Richard K. Robinson holds Ph.D. and MBA degrees from Northwestern University. He is an associate professor in the Marketing Department at Marquette University and was coprincipal investigator for the tri-state project reported here as well as for a government-funded mass transit study. His specialty is services marketing strategy involving consulting with organizations in the public and private sectors.
- David A. Kuemmel, P.E., is currently with Marquette's Transportation Research Center, which he founded after retiring as a commissioner in the Department of Public Works of the City of Milwaukee. His teaching and research have focused on highway maintenance, pavements, and traffic operations. Recently completed projects include major national research in highway tire and/or pavement noise and the tri-state project reported here, in which he was coprincipal investigator with Dr. Robinson.

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Appendix
Table 1: Profile of Minnesota Respondents

Demographic	*Percentage*
Gender	
Male	62
Female	38
Age	
18 to 35 years	31.2
36 to 49 years	37.0
50 years and older	31.7
Education	
High school or less	42.1
Some college	32.1
College graduate	25.5
License	
Regular only	64.4
Commercial (CDL)	17.3
Motorcycle	18.3

Table 2: Drivers' Perceptions of State Department of Transportation (DOT)

Statement	*Iowa (%)*	*Minnesota (%)*	*Wisconsin (%)*
The state DOT is capable of doing a good job of fixing and replacing pavements on rural highways in (state).	77	78	83
I trust the judgment of the state DOT when it comes to scheduling pavement improvements.	64	58	61
The state DOT officials care about the safety and convenience of drivers on this stretch of highway.	78	74	75
The state DOT considers input from people like me when making decisions about repairs or improvements to this stretch of highway.	38	39	43

NOTE: Each percentage = total of *strongly agree* and *somewhat agree* responses

Table 3: Tradeoff Questions Response Survey

Tradeoffs	*Average % for Three States*
Construction Choices	
Resurface every 18 to 20 years or 10 to 12 years	81.5
10 mile/year for 3 years or 30 miles/1 year.	62.9
30-minute detour for 2 months, or 10-minute detour for 6 months	59.9
Work zone travel times and speed limits[a]	
Reasonable travel time for 10-mile work zone: 20 to 25 minutes	65.9
Unreasonable travel time: 25 to 30 minutes	45.1
Reasonable speed limit: 31 to 40 mph	51.6
Unreasonable speed limit: 25 mph	49.5

NOTE: a. Regular speed limit on rural, two-lane highways (RTLH) = 55 mph.

Table 4: Relationship Between Department of Transportation (DOT) Perception and Pavement Satisfaction

Perception/Satisfaction	*Satisfied with Pavement*	*Improve the Pavement*	*Pavement Better Than Most*
State DOT is capable	+	–	+[a]
Trust state DOT's judgment	+	–	+
State DOT officials care	+	–	+
State DOT considers input	+	–	+

NOTE: a. Wisconsin not statistically significant
+ = positive relationship, - = negative relationship
Significance, $p < .01$.