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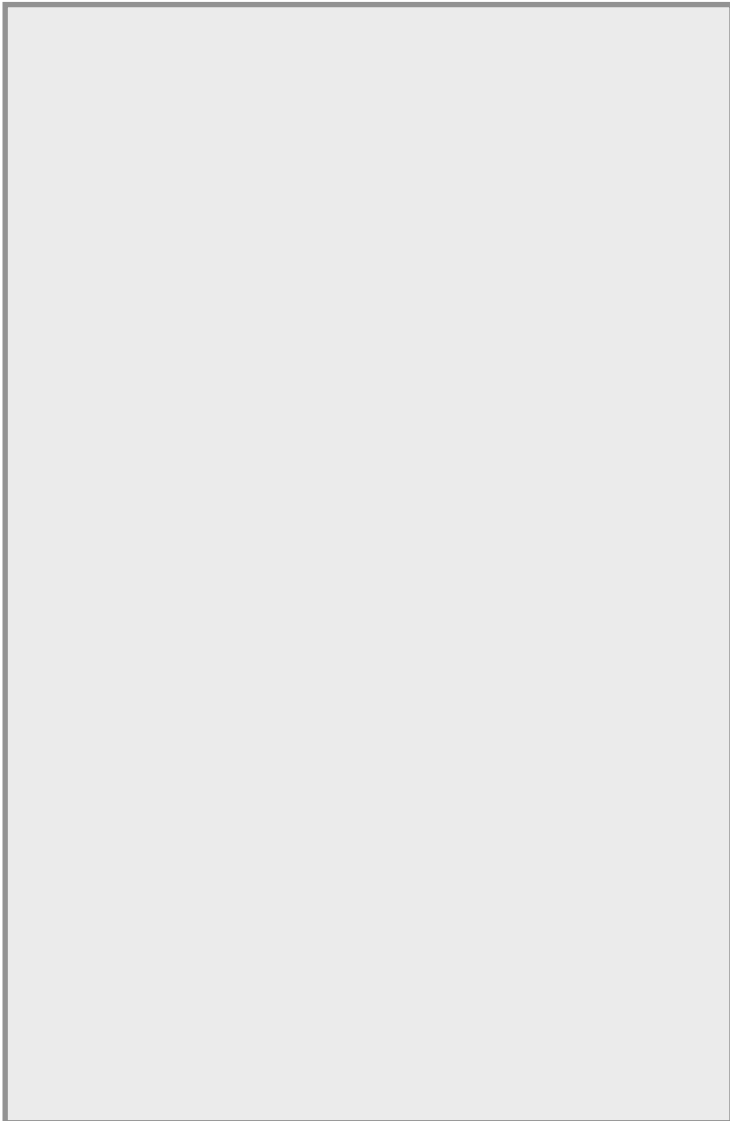
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How a Pavement Management Program Breaks the "Worst-to-First" Cycle: Maximizing Taxpayer Investment and Improving Roadways

By Howard Mills, a former Wallkill Town Supervisor, a Member of the New York State Assembly and New York State Superintendent of Insurance. He is now a partner at Pavement Management Group.

As a former Wallkill Town Supervisor (Orange County, 1994-1998) I understand the myriad challenges town officials face in maintaining and improving their roadway network. Budget constraints and constituent pressures make the prioritization of roadway work difficult for all municipal officials. The objective must always be to maximize the taxpayers' investment and do what is best for the entire roadway network for the long-term.

I experienced how hard this is and remember well contentious town board meetings with residents demanding immediate attention to improving their road with the cumulative requests exceeding what our budget could deliver. Constituent requests, appropriately, never cease – they are the taxpayers, and they deserve the best services possible. During my service as town supervisor, I dealt with these difficult choices every day, and I often wished there were effective and transparent tools to objectively assess and prioritize road maintenance needs.

While it is well understood that it is far less expensive to keep a road in good condition than it is to repair it once it has deteriorated, many municipalities are compelled to take a "worst-to-first" approach. Worst-to-first is when public pressure leads to a town annually expending the majority of its roadway budget on the roads that are generating the most complaints, the worst roads, with very costly repairs. The budget is so depleted after these projects that the resources do not exist to ensure that roads that are in good condition are kept that way with treatments that are inexpensive. The worst roads get work first and a destructive cycle sets in, roadways that have received the

bulk of a given budget are then neglected in subsequent years when the application of economical treatments would preserve and extend the life of these roads and protect the taxpayers' investment. Thus the "*worst-to-first*" cycle repeats, resulting in an overall deteriorating roadway network.

Fortunately the tools that I wished I had when I was in office are now here, they come together in what is known as a pavement management program (PMP) and are the answer to the worst-to-first cycle. A PMP is a systematic approach to the annual maintenance and repair of roadway networks that maximizes budgets and identifies the right treatment to the right road at the right time. A sophisticated pavement management program empowers municipal leaders to make data-driven decisions that save tax dollars and improve roads for the long-term while building trust and confidence by demonstrating impartial, competent and transparent decision-making.

My experience as a town supervisor informs me as to what town leaders should ensure are the core of a robust pavement management program. The critical six elements of an effective pavement management program are:

1. **Accurate Roadway Inventory.** An accurate inventory of the complete roadway network is essential. This includes all municipal jurisdictions, precise length and width measurements of all road segments, identification of roadway surface types, and classification of all roads as residential, business, industrial, minor/major collector, or minor/major arterial.

2. **Pavement Condition Index (PCI).** The ability to provide a precise Pavement Condition Index (PCI) rating on a scale of 0-100 to the highest American Society of Testing and Materials (ASTM) standard is crucial. PCI scoring is complex and relies on accurately identifying 20 distinct roadway distresses, as defined by the ASTM D 6433 standard for roadway condition assessments, developed by the U.S. Army Corps of Engineers, and assigning a severity grade of low, medium, or high to each distress. High-resolution video data capture is the most effective method for ensuring precise PCI scoring, often combined with AI technology to assist in the evaluation. The accuracy of the AI should be carefully scrutinized — specifically, the quality and quantity of labeled datasets used for training. AI can accelerate results, but without sufficient specificity in the training data to align with ASTM standards, the analysis could be inaccurate, leading to poor decision-making and suboptimal maintenance plans. Importantly, the most accurate ASTM-standard PCI scoring always involves quality control by human pavement experts, as AI models are not yet infallible and require human-in-the-loop expert oversight to verify findings and correct errors.

3. **Prioritizing Projects.** An effective PMP enables municipal leaders to prioritize projects based on the criticality of each roadway segment, the classification of the road, and the available budget. This allows the effective and strategic deployment of resources and builds a rationale for annual budget expenditures and project plans that can be explained to residents and taxpayers.

4. **The Right Treatment for Each Road.** The expertise to prescribe the most effective treatment for each road segment and the pavement experience to employ all the strategies and treatments available such as rejuvenation, crack fill, micro-surfacing, slurry, chip seals, cape seals, mill and overlay, and full-depth reconstruction. Too many municipalities rely on only a few methods, missing valuable opportunities to maximize available resources and extend the life of their roadways.

5. **Accurate Cost Estimation and Budget Projections.** An effective PMP must be able to estimate the costs of all recommended treatments accurately, based on current pricing information for each region and climate. This pricing information helps to develop budget projections and future funding scenarios, enabling municipal officials to effectively manage infrastructure in the long term while understanding and explaining the fiscal impacts of all decisions.

6. **Transparent Communication with Stakeholders.** The most effective pavement management program provides a platform that allows municipal leaders to explain the holistic approach for the entire roadway network to constituents and stakeholders in a transparent, logical, and easy-to-understand manner. This gives Town officials a powerful communications tool that creates trust and confidence in municipal governance. Detailed and user-friendly dashboards are effective for public works professionals to plan and manage projects, and for elected officials to communicate these plans and their impact on taxpayers to the public.

By ensuring that these six elements are the core of their Pavement Management Program, municipalities will maximize the investments of their taxpayers and demonstrate that the entire roadway network is being improved. Town leaders will earn the trust and confidence of their constituents that they are effective and thoughtful stewards of public infrastructure. The worst-to-first cycle will be replaced with data-driven decisions and a legacy of wise infrastructure management that public officials can pass on to their successors ensuring sustainable and improved roadways for future generations. ❏