

RESEARCH REVIEW: Asset Management at the Local and County Level

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“In this time of aging infrastructure and shrinking construction-budget buying power, adopting asset management’s core principle of goal-oriented, data-supported decision making is becoming more and more critical to meeting the public’s desired services. This also entails prioritizing preserving good roads over renewing the worst roads first; it is critical to think “the right fix, at the right time, on the right road.” This may seem very complicated and, certainly, AM can be complex with expensive computer models. However, it can also be as simple as a spreadsheet with an inventory, expert-determined condition ratings on a visual 1-5 scale, and a thoughtfully determined goal for the desired system condition. The only truly required element is using the available data and the gap between current and desired conditions to help make the decisions that best preserve the vast investments of our predecessors.”

– Scott Zainhofsky, Planning/Asset Management Division Engineer, North Dakota Department of Transportation

Post World War II, North Dakota and the nation at large saw an infrastructure boom. Since then, shrinking budgets and rising construction costs have complicated keeping the built infrastructure in good working order. To help stretch the limited budgets, county and local roadway managers must implement an asset management program (AMP). There is no one size fits all AMP, as many counties and cities do not have the data or labor force to run a full service AMP. However, it is still necessary for all roadway managers to understand the concept of asset management to help improve decision-making through identifying project tradeoffs. Asset management can be completed with spreadsheets and a simple visual rating system. There are many commercially available asset management software packages available. Since it is an ever changing group of programs, this research paper will not cover any of them, rather the decisions managers must make to use these programs effectively.

Asset management (specifically pavement management) has been in development since the 1960s, when the United States Interstate system started to have premature failure. An understanding that pavements couldn’t last 30-50 years based on the empirical calculations at the AASHO road in Illinois slowly came with the increasing failures. Managers realized that these pavements will have to be preserved, maintained and ultimately replaced sooner than initially thought.

Federal Highway and several other government organizations have developed an asset management program. However, unlike local jurisdictions, these systems have large staff to asset ratios that allow for them to gather and maintain their asset data more effectively. Many countries, such as Australia, Canada and New Zealand, have robust asset management programs built for their limited federal systems. In studying these other countries, it has been found that the best AMPs have had a strong leadership component, with the roadway manager and decision makers on the same page to best develop a single plan. Data driven, well thought and executed asset management plans are a key way to best leverage the limited funding transportation faces in the future.

The largest hurdle initial AMP systems ran into was data management. To properly make decisions, large amounts of information are required of the pavement system. These can include, and are not limited to: surface distress, smoothness, structural capacity, surface friction, and geometrics. All of this data takes time to evaluate and catalogue. There are many ways (both automated and human-based) to collect this data. During the establishment of an AMP, roadway managers must decide what factors are important to them and what data is necessary to track these factors. One of the previous roadblocks in AMPs was data management and storage, but with modern computers and data services, this is no longer the case.

After data has been collected and managed, roadway managers must then determine the most efficient use of their money. Usually, this involves prioritizing lower cost maintenance and thin overlays over more costly rebuilds, which is the inverse of the prevailing worst-first policy. Additionally, some AMPs can help managers forecast the future condition of their roadways. With this additional information, roadway managers can better manage their system based on traffic forecasts and future commercial development.

Roadway managers must also realize that even the best AMP software cannot replace proper engineering and economic decision making. Managers must make the proper decision for their roadway network based on funding, economically viable management technologies (based on local construction techniques and contractors), and anticipated traffic loads. All of these can be weighted differently by the manager to come up with the proper optimization. This information can be used to create a 5 or 10 year plan, which can and should be updated yearly to reflect unforeseen changes in traffic due to economic development.

Asset Management Programs are a useful tool to help roadway managers understand their existing road and bridge system. However, to best leverage this technology, roadway managers must understand the underlying data and economic theories. There are many resources available from Federal Highway and other researchers to help better understand AMPs and their planning. Managers must also understand the strengths and limitations of the asset management software they are using to best understand their system and create a solid, thought out working plan from the outputs.

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