Virg Bernero, Mayor

Street System
Asset Management Plan

April 27, 2007 JKD
Adopted by City Council June 25, 2007

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Introduction

Act 499 of the State of Michigan Public Acts of 2002 encourages the City of Lansing to maintain an asset management plan to assess our current street conditions, set target funding levels, identify candidate projects, set priorities, develop a multi-year program, and report results. The act defines asset management as "an ongoing process of maintaining, upgrading and operating physical assets cost-effectively, based on a continuous physical inventory and condition assessment." Asset management consists of business principles and practices for improving resource allocation decisions. It requires a shift from a traditional tactical project management approach (worst streets first) to a strategic, comprehensive systems management concept (right mix of fixes at the right time).

Michigan legislation (ACT 499) now requires reporting that is contained within this document. Michigan Department of Transportation (MDOT) will allow the City unrestricted allocation of ACT 51 revenues between major and local streets efforts with approval of this document by the Michigan Transportation Asset Management Council (TAMC),.

Information about asset management in this document is taken from the <u>Asset Management Guide for Local Agencies in Michigan</u>, sponsored by the Michigan Transportation Asset Management Council (TAMC) prepared by Cambridge Systematics, Inc, available on the TAMC website.

The core principles of asset management are:
- Performance Based
- Decisions Based on Quality Information
- Policy Driven
- Analysis of Options and Tradeoffs
- Monitoring to Provide Clear Accountability and Feedback.

With the passage of Act 499 and the adoption of this Asset Management Plan, we are beginning to look at our street conditions as a complete system and shifting away from emphasis on separate street projects and a worse case first approach. Traditionally, prioritization of street projects has concentrated on the immediate and most severe problems. Asset management allows decisions to be made with regard to the long-range condition of the entire system. This requires various investment strategies which maintain the entire system in the best condition possible within the constraints of the budget. The focus of street repairs is taken away from the worse street first scenario and placed on the right mix of fixes at the right time.

The City of Lansing Asset Management Plan follows the model from the TAMC <u>Asset Management Guide for Local Agencies in Michigan</u>. It is outlined in these five steps.
1. Assess current condition
2. Set program targets and funding levels
3. Identify Candidate Projects
4. Set priorities and develop multi-year program
5. Report results from the multi-year program listing the planned street projects.

Step One: Assessment of Current Condition

Performance measures

The City of Lansing has adopted the Pavement Surface Evaluation and Rating (PASER) system for measuring the City's pavement condition. PASER is a visual survey method of street conditions developed by the University of Wisconsin Transportation Information Center. It provides a simple, efficient and consistent method for evaluating street condition. PASER uses a scale of 1 to 10 to rate the streets. A rating of 10 is excellent and is assigned to new pavement. A rating of 1 is assigned to failed pavement with restricted speed, extensive potholes and an almost total loss of pavement integrity.

The 10 ratings are grouped into three categories based upon the type of work that is required for each rating – routine maintenance, capital preventive maintenance, and structural improvement.

> Routine Maintenance (8, 9, 10) activities are day-to-day scheduled activities performed by our Operations & Maintenance Division designed to prevent water from seeping into the surface. They include street sweeping and catch basin cleaning.

> Capital Preventive Maintenance (5, 6, 7) activities are planned cost effective treatments designed to protect the pavement structure, slow the rate of deterioration, and correct pavement surface deficiencies without significantly increasing the structural capacity. Maintenance activities include crack sealing and thin overlays, less than 2 inches thick.

> Structural Improvement (1, 2, 3, 4) activities are needed when the pavement condition has deteriorated to a condition where it needs to be removed and replaced. Activities include full overlays of 2 inches or more or complete reconstruction with new curb & gutter and major rehabilitation such as milling and resurfacing the existing pavement.

Data Collection

The condition data is collected by City staff with training in the PASER system and recorded in our RoadSoft database. RoadSoft is a program developed by Michigan Technological University utilizing a GIS mapping system and PASER ratings. The data is collected every one or two years, and should never be more than three years old.

Condition data for our local streets was collected in July, 2004 and again in September, 2006. The major streets have been rated each year in 2003, 2004, 2005, and 2006 in accordance with The Asset Management Council (TAMC) reporting requirements. TAMC has required that the major streets be rated each year by a team of raters consisting of City, MDOT and Tri-County Regional Planning Commission staff.

Current Conditions

The City of Lansing rated all streets in the City Limits using the PASER system.   The streets are separated by their ACT 51 designation as either major or local and then are grouped by their PASER ratings into three work categories.

Table 1.
2006 Major Street Condition Summary

Rating	Miles	Total Miles for each category	Percentage	Rehabilitation Category
10	2.41			
9	10.75	32.67	30.4%	Routine Maintenance
8	19.51			
7	27.11			
6	27.84	65.76	61.3%	Capital Preventive Maintenance
5	10.81			
4	4.90			
3	2.12	8.15	7.6%	Structural Improvement
2	1.13			
1	0.00			
Not-Rated	0.73	0.73	0.7%	
Total	107.31	107.31	100.000%	

Table 2.
2006 Local Street Condition Summary

Rating	Miles	Total Miles for each category	Percentage	Rehabilitation Category
10	7.38			
9	24.75	66.33	22%	Routine Maintenance
8	34.20			
7	45.60			
6	64.51	173.33	57%	Capital Preventative Maintenance
5	63.22			
4	28.04			
3	19.32	58.35	19%	Structural Improvement
2	10.31			
1	0.68			
Not Rated	4.57	4.57	2%	
Total	302.58	302.58	100%	

Step Two: Set Program Targets and Funding Levels

Now that we have an accurate measurement of the current condition of our street assets, the next step is to establish system wide condition objectives and funding requirements.

Elements of Pavement Management

The following information is copied from the City of Ionia Asset Management Report "Applying the Right Fix at the Right Time in the Right Place – A new approach for a new century." It also appears in the 2004 Annual Report of the Transportation Asset Management Council.

Once a street has been constructed or reconstructed, the condition of the pavement will begin to change, primarily due to weather/environmental factors and traffic loads. Weather factors include the amount of rain/snow, temperatures (particularly extreme heat and cold), humidity, freeze-thaw cycles, exposure to sunlight, etc. Traffic load includes some function of traffic frequency and the weight of the vehicles.

There are also cross effects between these two main factors. Heavy and frequent traffic loadings while the pavement is made more vulnerable due to weather will cause more damage than the same loadings during favorable weather. In addition, several other factors can contribute to the rate at which a segment of pavement deteriorates. These include:
- *Type, condition, and moisture of the sub grade soil,*
- *Type, thickness, and strength of the base materials, and*
- *Timing of preventive maintenance fixes.*

According to the American Association of State Highway and Transportation Officials (AASHTO): "Those who work with pavements know that after a pavement is built, traffic and environmental loadings create unavoidable stress that will eventually reduce the condition of the streets to a point where they will not be usable without maintenance. They also know that early treatment will extend the life of some pavement."

Preventive maintenance programs are designed to extend the life of good pavements by applying low cost, short term treatments. Preventive maintenance projects are low cost capital improvement projects intended to protect an existing pavement structure, slow the rate of pavement deterioration and/or correct overall deficiencies in the pavement surface. The benefit of preventive maintenance activity can only be realized if the agency supplies treatments to pavements in good condition. Preventive maintenance treatments cannot be targeted to the worst streets, but must be made to those in fair or good condition which have minor defects that if left unattended would require much more costly repairs.

__The real challenge for most agencies is to ascertain when in the life of a pavement is the best time to apply a preventive maintenance treatment for the maximum benefit.__ Preventive maintenance is perhaps the single most influential component in the network strategy that allows an agency to manage pavement conditions. It creates the ability to postpone costly reconstruction or rehabilitation activities, by extending the remaining service life of the original pavement. A significant benefit of a comprehensive preventive maintenance program is that it gives managers control over future network conditions and funding requirements. By controlling future network conditions, decision makers can anticipate routine maintenance work loads, safety deficiencies, and ride quality needs.

Several studies have found that a dollar invested in preventive maintenance will save from $4 to $6 in future reconstruction or rehabilitation costs.

Our streets are presently in every stage of deterioration. Street pavements range from brand new with no water infiltration to very poor condition where the soils beneath the pavement have been saturated, frozen and loaded over so many years that the pavement structure is destroyed. The asset management plan has to analyze the current condition of all the streets and optimize the mix of repair strategies to achieve the best overall system rating. If we concentrate our repairs on the streets that are in the worst condition, we allow the streets that are not in such condition to continue to accept water and deteriorate. The asset management plan allows us to analyze available budgets and street conditions to generate cost effective repair strategies to include a mix of routine maintenance, capital preventive maintenance and structural improvements. **An ideal pavement management system recognizes that to manage a street system in its optimum condition requires application of the right combination of street activities at the right time.**

The goal of this asset management plan is to have all the streets at an acceptable level of condition, so that the street system can be maintained through an established annual budget utilizing the right mix of fixes at the right times. There will no longer be a need to spend huge amounts of money to make up for years of under funding.

The target objective is to have 95 % of our streets at a PASER rating of 5 or better within the next 10 years.

Estimated Unit Costs

To relate an annual budget to street system condition improvements for the City of Lansing we reviewed unit costs in past projects and in current Michigan Department of Transportation (MDOT) publications, and developed estimated unit costs for the different types of repair strategies. The following table lists the type of activity and the estimated cost per lane mile that were used for this report.

Table 3.
Average Pavement Repair Costs

Activity	Costs per Lane Mile
Structural Improvements	
Major (Reconstruction)	$ 435,000
Major (Mill & Resurface, 3" thick)	$ 130,000
Local (Reconstruction)	$ 330,000
Local (Crush & Reshape)	$ 130,000
Capital Preventative Maintenance	
Major (Mill & Resurface, 1.5" thick)	$ 60,000
Major & Local (HMA ultra-thin overlay)	$ 50,000
Local (Overlay)	$ 32,000
Major & Local (Crack Sealing)	$ 3,000
Routine Maintenance	
Major & Local (Street sweeping, etc.)	$ 1,000

Estimated Future Funding Levels

After estimating unit costs we looked at historical funding levels and considered the costs of large projects that are already underway. Based on these values, we have estimated our annual budget for the next 5 years. Funding sources include general fund, federal funds, and Act 51 gasoline tax funds. The table in Appendix A is a summary of the annual street budget from 1996 to present. FY 2008 funding has been estimated to be flat, with 2009-12 showing a 3% increase.

Act 51 (gasoline tax) funds from the state available for the Asset Management Plan are estimated to be about $2 million per year. About $1.2 million is designated as major street funding and $400,000 as local street funding. Another $400,000 is available from the Metro Act funding and is available for either major or local streets. For budget purposes in this report, it is assumed that Act 51 Metro Act funds will be made available for local streets.

Federal Funds are available for major streets in the form of Surface Transportation Program (STP) funding. It is assumed that $1 million per year is available to the City of Lansing for STP projects. The federal aid portion of the street program is governed by the current federal transportation act, the Federal Safe, Accountable, Flexible, and Efficient Transportation Equity Act: a Legacy for Users (SAFETEA-LU). SAFETEA-LU outlines a planning process for all street projects that use Federal funds. The process assures the projects address identified needs, conform to air quality guidelines, and address multimodal concerns. It also assures the public has an opportunity to comment on the selected projects. The City of Lansing works with the Tri-County Regional Planning Commission, and our federally funded projects appear in the TCRPC Transportation Improvement Program (TIP).

The Combined Sewer Overflow project has a major impact on our street repair program. This is a 30 year Sewer Separation Project that began in 1990. Combined sewer systems carry both sanitary sewage and rain water in a single pipe. In dry weather, the sewage goes to the wastewater treatment plant but in wet weather it is sometimes discharged to the river. The City is separating the combined system by constructing new sanitary sewers.

Streets that are reconstructed because sanitary sewers need to be constructed beneath them skew the "right mix of fixes at the right time" strategy. Many times the pavement is in poor condition and reconstruction is a suitable fix. Other times, a less expensive treatment option would be appropriate. Each year in the "$7 million for 7 years street program" from 1996 through 2003, more and more of the $7 million funding went to the CSO program and away from the cost effective, right fix at the right time projects. We were using our street dollars to reconstruct pavements without regard to other suitable treatments.

Beginning in fiscal year 2006, all pavement repair in CSO projects is funded separately from the street repair program (now the asset management plan). Pavement repair deemed by the Michigan Departmental of Environmental Quality (DEQ) to be "ineligible' for sewer funding is funded by bonds and other funding sources outside of the asset management plan. The streets within each of the CSO phasing areas are listed in the multi-year street program and scheduled for reconstruction. The costs associated with these projects are not considered in the strategy evaluations. The streets within these projects are considered as sub-networks of major and local streets and are considered in separate strategy evaluations.

Major Street / Local Street Allocation
75% of the available funds in the asset management plan are allocated to major streets and 25% are allocated to the local streets. This is based on the miles of streets and the average traffic counts for each category. The average daily traffic on major streets is about 10 times that of local streets and there are three times as many miles of local streets as major streets. This equates to 750,000 vehicle miles on major streets and 250,000 vehicle miles on local streets each year or a split of 75/25.

In summary, for future level spending budgets in this report, $2,250,000 per year is available for major streets in Act 51 and STP funding and $750,000 is available for local streets in Act 51 funding.

Predicting Future Condition as a Function of Investment Level

The future condition of our street system depends on how much the City is able to invest in our pavement management strategies.

Street System Analysis
Pavement management systems (PMS) support the entire resource allocation process, including the analysis of future pavement conditions. Specifically, they help
- Maintain an inventory of streets and their condition
- Estimate the current condition of the overall network
- Predict the future condition of the network based on standard deterioration curves and funding strategies
- Optimize alternative repair and funding strategies
- Promote communication within the City of Lansing administration and City Council
- Promote communication with the public.

A pavement management system is a method of tracking and analyzing street conditions. The system used in Lansing until 2004 was originally purchased in the 1980's and had been updated over the years. Performance indicators included the ride comfort index (RCI) which measured the up and down motion of the wheels on a specially designed vehicle, the surface distress index (SDI) which counted the number of cracks and potholes, the pavement quality index (PQI) which is a calculated value based on the other indexes and the structural adequacy index (SAI) which is a measure of the pavement strength.

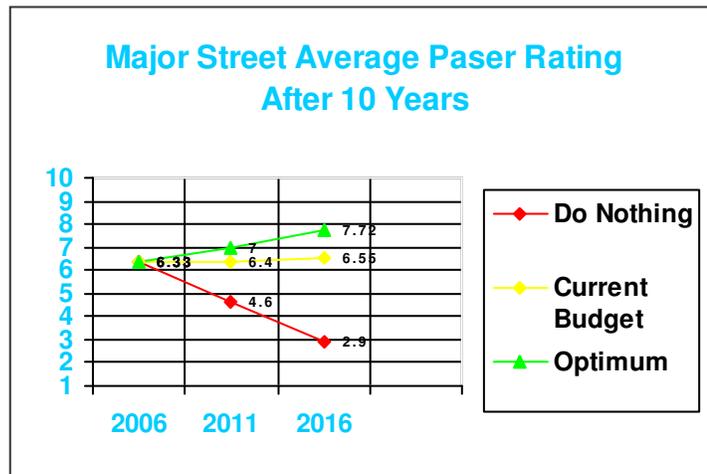In 2004, we switched products and began using Roadsoft, a program/database developed by Michigan Technological University and widely used in Michigan. This program is also used by the by the Transportation Asset Management Council. It has the advantage of being easy to use and less expensive to maintain. Street condition surveys are completed by City staff using the PASER rating system which is a "windshield survey" rating of 1-10.

Evaluating future conditions with RoadSoft

RoadSoft estimates the future PASER ratings for the major street and local street networks over time based on current condition data, the proposed treatments and information on available funding levels. RoadSoft allows us to compare different "what if" plans with different types of repairs and funding levels through strategy optimization and evaluation programming. Several optimization strategies are presented in this report.

The amount of funding invested in the system is related to the overall condition. A typical graph relating network improvement over time base on funding levels is shown below.

Figure 1.

Major Street Average Paser Rating
After 10 Years

Legend: Do Nothing, Current Budget, Optimum

Data points: 6.33 (2006), 7 (2011 Optimum), 7.72 (2016 Optimum), 6.4 (2011 Current Budget), 6.55 (2016 Current Budget), 4.6 (2011 Do Nothing), 2.9 (2016 Do Nothing)

Years: 2006, 2011, 2016

Window of Opportunity

The graphs on the next page show the window of opportunity concept in which certain types of treatments are feasible. This concept of window of opportunity is the basis for the recommendation treatments. Each curve on the graph represents the street deterioration after a treatment has been completed.

Each of the following major street treatments are represented by a curve on the graph:
- Crack seal treatment (CPM) - cost per lane mile = $ 3,000
- Thin Overlay (CPM) - cost per lane mile = $ 50,000
- Mill & Resurface (SI) - cost per lane mile = $130,000
- Reconstruction (SI) - cost per lane mile = $435,000

The right fix at the right time will delay the need for street reconstruction. A street will need to be reconstructed every 20 years without preventive maintenance. With preventive maintenance, the first structural improvements will not be needed for more than 30 years. After 20 years, preventive maintenance costs to maintain the lane mile street represented in the graph are $53,000. Without preventive maintenance, the cost to reconstruct the lane mile street is $435,000.
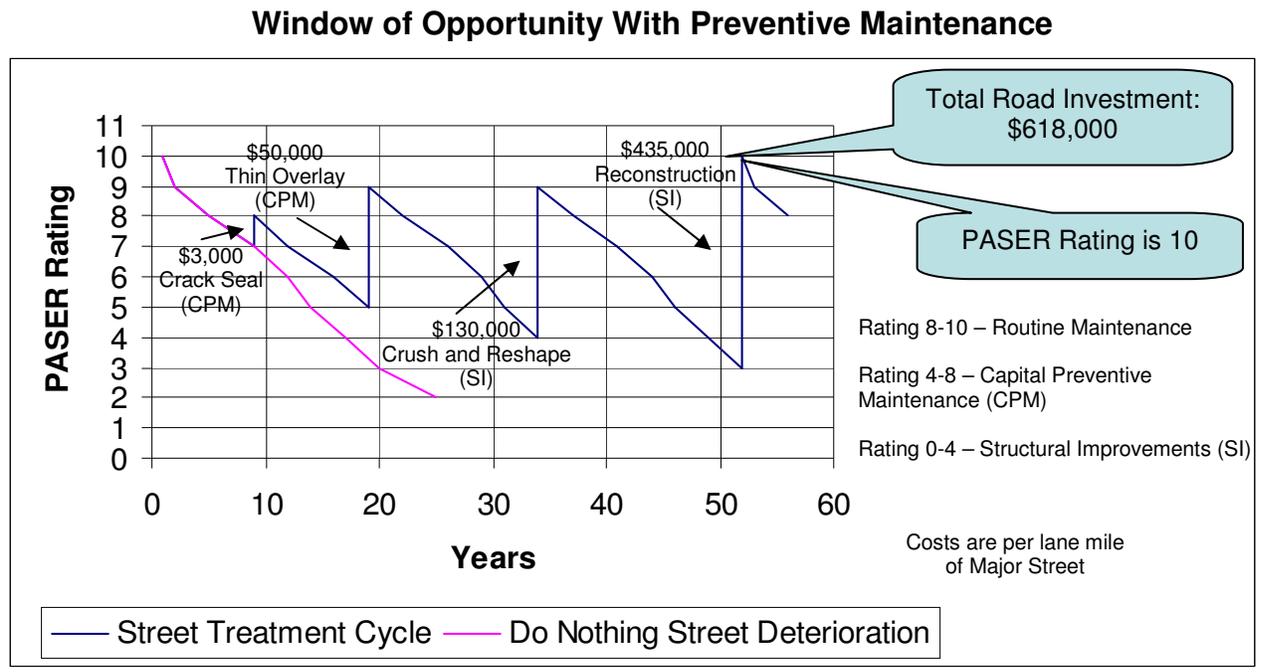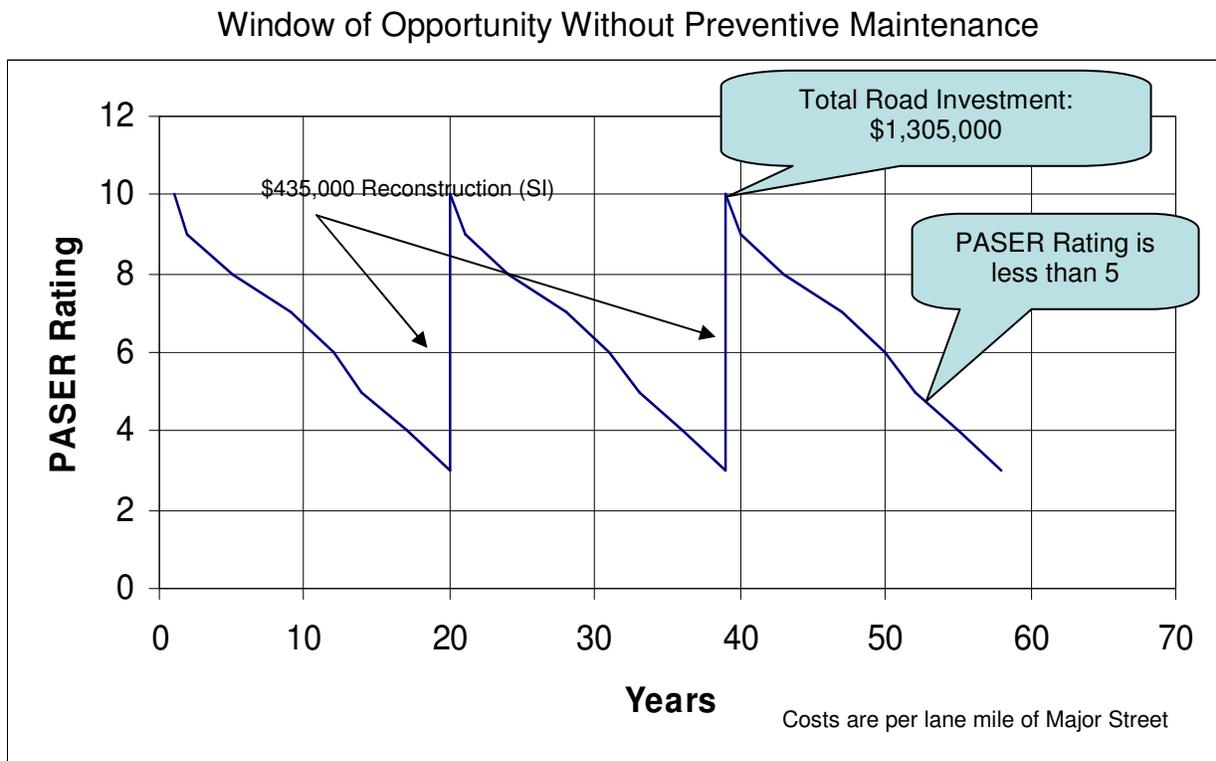
Figure 2.

Window of Opportunity With Preventive Maintenance

Total Road Investment: $618,000

PASER Rating is 10

$50,000 Thin Overlay (CPM)

$435,000 Reconstruction (SI)

$3,000 Crack Seal (CPM)

$130,000 Crush and Reshape (SI)

Rating 8-10 – Routine Maintenance

Rating 4-8 – Capital Preventive Maintenance (CPM)

Rating 0-4 – Structural Improvements (SI)

Costs are per lane mile of Major Street

PASER Rating

Years

—— Street Treatment Cycle —— Do Nothing Street Deterioration

Figure 3.

Window of Opportunity Without Preventive Maintenance

Total Road Investment: $1,305,000

$435,000 Reconstruction (SI)

PASER Rating is less than 5

PASER Rating

Years

Costs are per lane mile of Major Street

Street Deterioration Over Time

Conduct tradeoff analysis

The next step is to review overall spending of Act 51 funding and consider tradeoff options. Consideration is given to how much money the City should spend on one type of work compared to another.

Routine maintenance versus other transportation work. The City typically allocates funds for routine maintenance before any other work is considered. Routine maintenance includes street sweeping and catch basin cleaning. The work is performed as daily work activities by crews in the Operations & Maintenance Division of the Public Service Department. This allocation is based on staffing levels and material costs and is a continuation of historic funding levels.

Preservation versus Traffic Improvements. This tradeoff addresses the amount of money allocated to preserving the existing transportation system versus the amount allocated to improve traffic conditions. This allocation is also generally based on historic funding and is not part of this discussion.

The need to add lanes, reconfiguring intersections and improving traffic signal operations, however, is considered and often included in reconstruction projects. These improvements often bring in additional funding sources to cover their costs of construction. For example, as a non-attainment area in federal air quality standards, the City of Lansing and the entire Tri-County area is eligible for Congestion Mitigation Air Quality (CMAQ) federal funding.

Sub Network or Geographic Distribution. Another consideration in project selection is the geographical location of a project. One goal is to spread the work across the City. Another goal is to group several streets together for construction efficiency and to help control costs.

Capital versus Preventive versus Maintenance – An optimal asset management strategy typically includes a mix of routine maintenance, preventive maintenance activities, and long-term capital improvement projects. The RoadSoft management system is used to determine the most appropriate mix of fixes for the City street network..

Setting Performance Targets

One of the results of a tradeoff analysis is a set of condition targets. Targets turn policies into guidance for project prioritization. It is in the City's best interest to preserve pavement condition. To support this policy, we have selected PASER ratings as a performance measure. The target condition is to maintain 95 % of our streets with a PASER rating of 5 or higher.

Another condition target is to reduce the number of streets in poor condition.

This goal cannot be realized in the next ten years at the current funding levels.

Step 3: Identify Candidate Projects

Candidate projects represent work that should be done. Street projects are prioritized and the highest priority projects are added to the multi-year program.

The Public Service Department has reviewed PASER ratings to identify candidate projects. The streets are listed in order the order of the PASER ratings and grouped in terms of recommended actions listed in the table "Recommended Treatments by PASER Rating" shown below.

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Table 4.
Recommended Treatments by PASER Rating

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PASER Rating	Major Streets Asphalt Pavements	Local Streets Asphalt Pavements
1, 2, or 3	Structural Improvements (SI) Reconstruction	Structural Improvements (SI) Reconstruction or crush & reshape
4	Structural Improvements (SI) Mill and resurface, 3 inch base repairs	Structural Improvements (SI) Reconstruction or Crush & reshape
5 or 6	Capital Preventive Maintenance (CPM) Mill and resurface, 1.5 inch	Capital Preventive Maintenance (CPM) Overlay, 1.5 inch
7	Capital Preventive Maintenance (CPM) Crack sealing	
8, 9, or 10	Routine maintenance (RM) Street Sweeping and Catch Basin Cleaning	Routine maintenance (RM) Street Sweeping and Catch Basin Cleaning

In the TAMC guide, a recommended treatment for capital preventive maintenance for asphalt pavements rated a 5 or 6 is Sealcoat.   Commonly known as chip-seal, this is the process of placing liquid asphalt and loose stone used by many county street commissions. It is important to note that Sealcoat is not currently used in the City. This treatment will be evaluated for inclusion as a Capital Preventive Maintenance treatment in the 5 year plan.

Selection of project candidates is based on current conditions, functional class (which dictates some funding sources) and other infrastructure work programmed (CSO projects). Streets within the CSO project areas are scheduled for reconstruction in the planned CSO project year. One additional selection criteria is curb condition, which isn't included in the program strategy evaluations. It is assumed that curb should be saved if it is functioning adequately to provide good drainage. The reconstruction unit costs include the cost to replace the curb & gutter. Where the curb is suitable to be left in place a crush & reshape unit cost was used in place of the reconstruction. The recommended treatments listed above for PASER ratings of 1-4 have been combined to two treatments, reconstruction or crush & reshape, for the purpose of this report and budgetary planning.

The City operates within tight budget constraints and so it is important to optimize the performance of our existing system. We can move towards this objective by dedicating a portion of the budget to fund capital preventive maintenance activities. Based on a life-cycle cost analysis, MDOT estimates that $1 invested in capital preventive maintenance will save from $4 to $6 in future reconstruction costs

Another consideration used is generating candidate projects based on stakeholder input. Stakeholders include all parties outside of the Public Service Department that have an interest in the street program, such as public, elected officials and partner agencies. This option looks beyond just the physical condition of the assets and generates projects based on the needs of the community.

Step Four: Set Priorities and Develop a Multi-Year Program

The next step in the resource allocation process is to prioritize candidate projects and develop a multi-year program. A fundamental goal is to apply the right fix at the right time in the right place.

We used the information from the list of identified candidates to develop a list of projects and define a set of factors to prioritize the streets for selection based upon available funding. We considered traffic levels, major or local street designations and corresponding funding sources. CSO projects and STP federally funded projects are listed in their programmed year. Where data in traffic counts and curb condition was lacking, the streets are ranked by Ward and according to the RoadSoft segment numbering system. In the coming months, we will conduct field visits to review and adjust the recommendations. We will update ratings, add traffic counts and curb conditions to the RoadSoft database. Engineering judgment and considerations will further determine project selections. Pedestrian safety, drainage, and traffic flow concerns will also be considered. In addition, we will review citizen input and comments from City Council members and the Mayor.

Routine maintenance is considered to be at appropriate levels and is not part of this discussion.

Consistency with Management System Recommendations

The RoadSoft management system is used to set performance targets and funding levels and it is important to maintain some level of consistency with these recommendations during the programming process. Otherwise, the value of using the systems is lost, and the credibility of the programming process will suffer.

The City's Combined Sewer Overflow (CSO) program, which continues through 2019, has to be considered in our asset management plan. A street is reconstructed when it is dug up to place a new sewer, even though other, less costly fixes may be appropriate for the condition of the street. The major and local street categories have been divided into CSO and non-CSO areas for the strategy optimizations and evaluations. The streets in CSO areas are assumed to be reconstructed in the corresponding CSO project year and are analyzed as such in the separate strategy networks.

Major Streets

Three strategies were evaluated for the major streets. The streets that will be reconstructed as part of a future CSO project were taken out of the major street network for the purpose of this strategy evaluation process.

The first strategy evaluated considered the 2008 budget for major streets. This includes federal STP funding, Act 51 funding necessary to provide the local share match (20% of construction costs) and engineering costs for the STP projects, and an additional $895,000 in ACT 51 discretionary funds. The RoadSoft strategy optimization program shows the following use of funds to combine the best mix of fixes to provide the highest overall network average PASER rating possible with these given parameters. The maximum budget amount in the strategy optimization program was set at $3,905,000 and the mileage of the known STP projects was assigned in the programmed project year.

Table 5

Strategy #1- 2008 Budget for Major Streets

Lane Miles	Type Rehab	Treatment	Treatment Year	2008 Budget
1.8	CPM	Mill & Resurface, 1.5 inch	2007	
2.5	SI	Mill & Resurface, 3 inch	2007	
3.6	SI	Reconstruction	2007	
65.0	CPM	Crack Seal	2007 through 2012	$ 195,000
11.6	CPM	Mill & Resurface, 1.5 inch	2008 through 2012	$ 700,000
7.0	SI	Reconstruction (STP projects)	2008	$3,010,000 $3,905,000 Total 2008
9.9	SI	Mill & Resurface, 3 inch (STP projects)	2009	
13.1	SI	Mill & Resurface, 3 inch (STP projects)	2010	
2.0	SI	Reconstruction (STP projects)	2011	

The second strategy evaluated considered an optimum budget for major streets. In this strategy optimization program, the maximum budget amount was left blank to signify unlimited funding. The result of the strategy optimization program shows the following use of funds to combine the best mix of fixes to provide the best overall network PASER rating possible. The annual average budget amount provided by the program is $2,700,000.

Table 6

Strategy #2 - Optimum - $2,700,000 Annual Budget

Lane Miles	Type Rehab	Treatment	Treatment Year
65.0	CPM	Crack Seal	2007-2012
10 .0	CPM	Mill & Resurface, 1.5 inch	2007-2012
7.5	SI	Mill & Resurface, 3 inch	2007-2012
5.0	SI	Reconstruction	2007-2012

The third strategy evaluated considered the STP projects that are programmed on the current and proposed Transportation Improvement Plans (TIP). The annual average budget would allow us to take full advantage of the federal funding but would limit us to only STP projects. The known STP projects were evaluated in their programmed years. The table for this strategy is shown on the next page.

Table 7

Strategy #3- STP projects only

Lane Miles	Type Rehab	Treatment	Treatment Year
2.5	SI	Mill & Resurface, 3 inch	2007
3.6	SI	Reconstruction	2007
7.0	SI	Reconstruction (STP projects)	2008
9.9	SI	Mill & Resurface, 3 inch (STP projects)	2009
13.1	SI	Mill & Resurface, 3 inch (STP projects)	2010
2.0	SI	Reconstruction (STP projects)	2011

A comparison of the 3 strategies is shown in the following graph. The graph shows remaining service life (RSL) over time. PASER ratings curves would match the remaining service life curves.

Figure 4
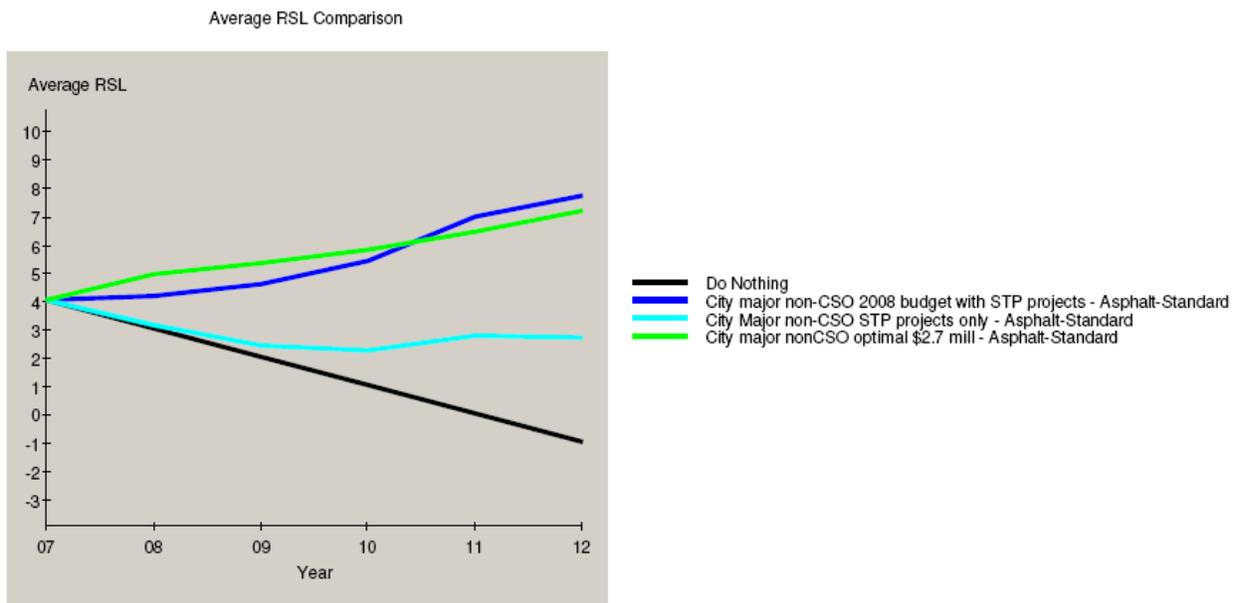
Local Streets

Four strategies were evaluated for the local streets. The streets that will be reconstructed as part of a future CSO project were taken out of the local street network for the purpose of this strategy evaluation process.

The first strategy considered the 2008 budget for local streets. This includes $1,100,000 in ACT 51 funding. The RosdSoft strategy optimization program shows the following use of funds to combine the best mix of fixes to provide the highest overall network average PASER rating possible with these given parameters. The maximum budget amount in the strategy optimization program was set at $1,100,000.

Table 8

Strategy #1 – 2008 Budget - $1,100,000

Lane Miles	Type Rehab	Treatment	Treatment Year	2008 Budget
65	CPM	Crack Seal	2007 – 2012	$ 195,000
4.0	CPM	Overlay, 1.5 inch	2007 – 2012	$ 125,000
6.0	SI	Crush & Reshape	2007 – 2012	$ 780,000
				$1,100,000

The second strategy considered a funding level that would allow the local street network to remain in the same condition it is today, neither gaining nor losing in the overall condition of the network. The result of the strategy optimization program shows the following use of funds to combine the best mix of fixes to provide the same overall network PASER rating that the current conditions provide. The annual average budget amount is $3,000,000.

Table 9

Strategy #2 - Maintain current network condition - $3,000,000 annual budget

Lane Miles	Type Rehab	Treatment	Treatment Year
45.0	CPM	Crack Seal	2007 - 2012
19.0	CPM	Overlay, 1.5 inch	2007 - 2012
18.0	SI	Crush & Reshape	2007 - 2012

The third strategy evaluated considered an optimum budget for local streets. In this strategy optimization program, the maximum budget amount was left blank to signify unlimited funding. The strategy optimization program shows the following use of funds to combine the best mix of fixes to provide the best overall network PASER rating possible. The annual average budget amount provided by the program is $8,700,000.

Table 10

Strategy #3 - Optimum - $8,700,000 annual budget

Lane Miles	Type Rehab	Treatment	Treatment Year
90.0	CPM	Crack Seal	2007 -2012
50.0	CPM	Overlay, 1.5 inch	2007 -2012
25.0	SI	Crush & Reshape	2007 -2012
12.0	SI	Reconstruction	2007 -2012

The graph on the following page shows the comparison of the results of the four strategies. The graph shows remaining service life (RSL) over time. PASER ratings curves would match the remaining service life curves.

Figure 5

Average RSL Comparison
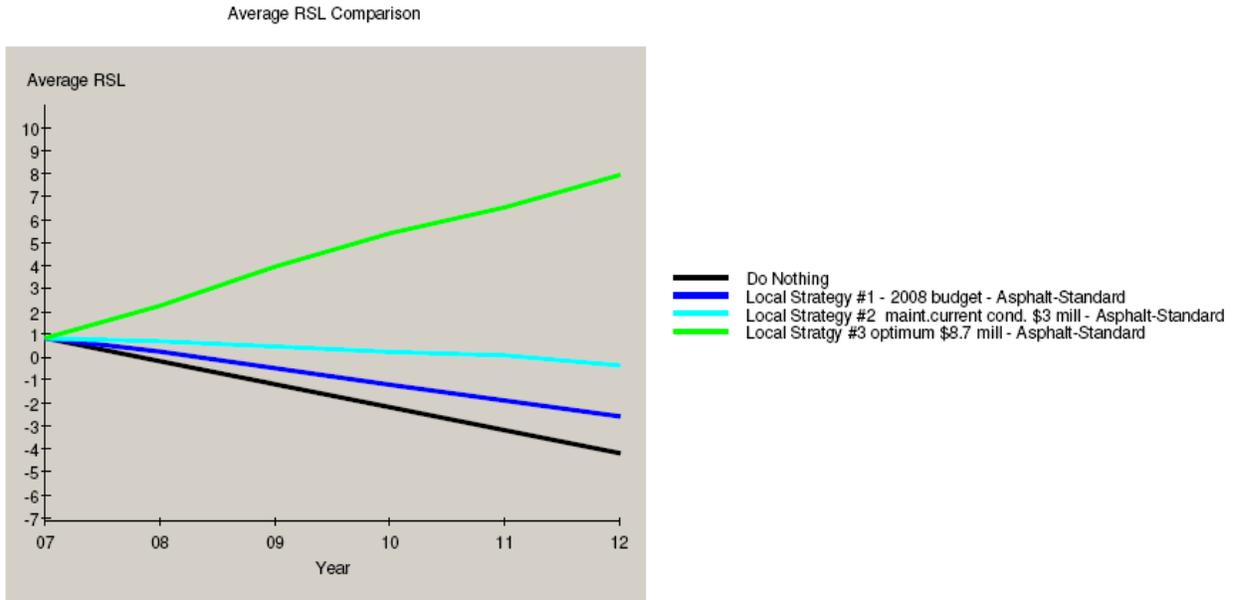
Current funding levels do not allow us to meet the target goals. As shown in the following tables, after 10 years at the current funding level, major streets in poor condition requiring structural improvements will have increased from the current 8% to 25% of the system. Local streets in poor condition will have increased from 19% to 42% of the system.

Table 11
Major Street Condition Summary

Rating	Miles	Current Condition		Rehabilitation Category	Optimal Program (Includes CSO reconstruction)		Current Budget Program (Includes CSO reconstruction)	
		Total Miles for each category	Percentage		Total Miles after 10 years	Percentage	Total Miles after 10 years	Percentage
10	2.41							
9	10.75	32.67	30.4%	Routine Maintenance	88.27	82%	67.90	64%
8	19.51							
7	27.11							
6	27.84	65.76	61.3%	Capital Preventative Maintenance	16.18	15%	12.24	11%
5	10.81							
4	4.90							
3	2.12	8.15	7.6%	Structural Improvement	2.86	3%	27.18	25%
2	1.13							
1	0.00							
Not-Rated	0.73	0.73	0.7%		0.00	0%	0.00	0%
Total	107.31	107.31	100.000%		107.31	100%	107.31	100%

Table 12
Local Street Condition Summary

Rating	Miles	Current Condition		Rehabilitation Category	Optimal Program (Includes CSO reconstruction)		Current Budget Program (Includes CSO reconstruction)	
		Total Miles for each category	Percentage		Total Miles after 10 years	Percentage	Total Miles after 10 years	Percentage
10	7.38							
9	24.75	66.33	22%	Routine Maintenance	198.00	66%	102.62	34%
8	34.20							
7	45.60							
6	64.51	173.33	57%	Capital Preventative Maintenance	101.11	33%	72.61	24%
5	63.22							
4	28.04	58.35	19%	Structural	3.47	1%	127.35	42%

				Improvement				
3	19.32							
2	10.31							
1	0.68							
Not Rated	4.57	4.57	2%		0.00	0%	0.00	0%
Total	302.58	302.58	100%		302.58	100%	302.58	100%

Step five: Reporting Results

The final step in the resource allocation process is to report results. Michigan's asset management legislation calls for agencies to develop a three-year program that is updated annually. The City of Lansing has elected to develop a five-year "rolling program" which will involve reviewing and updating the projects each year of the program and then selecting projects for the new fifth year. A list of work planned for the next three years with locations and associated costs will be submitted to TAMC each year.

Condition Report – The total mileage of the street network and a summary of pavement conditions will be generated yearly.

Record of Work – A list of transportation maintenance, operational or improvement activities performed in the previous year with locations and associated costs will be provided through the RoadSoft database record keeping and reporting system and project records.

Conclusions

Asset management is an ongoing process of maintaining, upgrading, and operating physical assets cost-effectively, based on a continuous physical inventory and condition assessment". Asset management consists of business principles and practices for improving resource allocation decisions. It requires a shift from the "worst street first" plan to the "right mix of fixes at the right time" plan. This asset management plan is a beginning. It provides a base line of current conditions and a "street" map of the future conditions. This plan is a "rolling plan", to be updated yearly, reflecting both new funding levels and revised street conditions.

This report makes the following points clear:

1. The City cannot meet the street system needs with current spending levels. Budget priorities should include additional street repair funds.

2. The City must explore ways to increase crack sealing and other cost effective capital preventive maintenance procedures. Previously un-tested treatments such as ultra-thin overlay and white-topping have to researched, developed and implemented.

This report along with the attached data appendices completes the City of Lansing's first Street System Asset Management Plan.

Summary of the annual street budget from 1996 to present. FY 2008 funding has been estimated to be flat. 2009-12 showing a 3% increase.

Appendix A

	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996
GENERAL FUND	$0	$0	$0	$0	$0	$0	$0	$0	$1,334,000	$1,500,722	$1,359,731	$109,939	$1,255,400	$2,583,740	$4,785,434	$3,258,000	$3,162,530
ACT 51 MAJOR STREETS	$632,632	$614,205	$596,316	$578,948	$562,085	$562,085	$400,000	$540,000	$127,279	$1,438,662	$970,831	$2,040,257	$1,214,750	$1,400,000	$844,073	$1,290,427	$918,833
ACT 51 MAJOR STP MATCH	$759,718	$737,591	$716,108	$695,250	$675,000	$675,000	$400,000	$550,000	$470,000	$0	$0	$0	$0	$0	$0	$0	$0
ACT 51 LOCAL STREETS	$450,204	$437,091	$424,360	$412,000	$400,000	$400,000	$771,000	$934,000	$114,776	$445,586	$563,838	$689,344	$1,139,850	$1,511,000	$980,000	$1,157,081	$1,153,300
ACT 51 METRO ACT	$447,953	$434,905	$422,238	$409,940	$398,000	$398,000	$384,914	$417,901	$377,303	$87,350	$0	$0	$0	$0	$0	$0	$0
OTHER									$210,000		$626,900	$225,000	$305,250	$250,000	$390,000	$50,000	
SUBTOTAL ACT 51	$2,290,506	$2,223,792	$2,159,022	$2,096,138	$2,035,085	$2,035,085	$1,955,914	$2,441,901	$1,299,358	$1,971,598	$2,161,569	$2,954,601	$2,659,850	$3,161,000	$2,214,073	$2,497,508	$2,072,133
MSHDA	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$200,000	$0	$0	$0	$0
CDBG	$0	$0	$0	$0	$0	$0	$0	160000	$160,830	$200,000	$200,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000
STP GRANT	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,410,000	$680,000	$1,470,000	$1,230,000	$2,584,600	$1,210,900	$600,000	$600,000	$734,800	$986,500
TOTAL ROAD PROGRAM BUDGET*	$3,290,506	$3,223,792	$3,159,022	$3,096,138	$3,035,085	$3,035,085	$2,955,914	$4,011,901	$3,474,188	$5,142,320	$4,951,300	$5,749,140	$5,426,150	$6,444,740	$7,699,507	$6,590,308	$6,321,163

Assumes no increase in 2008 with a 3% increase in Act 51 $ in 2009-12

*NOT INCLUDING CSO

Avg. Annual Funding antic $3,160,909

Notes:

2005 Budget had $400,000 in General Fund in budget book, but $ was pulled.
2004 Budget had $1,080,000 in Road $ plus $254,000 for Washington Mall
2003 Budget had $1,082,722 in Road $ plus $418,000 for Washington Mall
2002 Budget had $291,731 in Road $ plus $1,068,000 for Washington Mall AND $326,900 for Capitol Loop

RESOLUTION #252
BY THE COMMITTEE OF THE WHOLE
RESOLVED BY THE CITY COUNCIL OF THE CITY OF LANSING

WHEREAS, Act 499 of the State of Michigan Public Acts of 2002 encourages all agencies that spend state transportation funds on roads and bridges to implement an asset management approach, under the leadership and oversight of the Michigan Transportation Asset Management Council (TAMC); and

WHEREAS, asset management is defined as "an ongoing process of maintaining, upgrading, and operating physical assets cost-effectively based on a continuous physical inventory and condition assessment;" and

WHEREAS, with the passage of Act 499 and the adoption of an asset management plan, the City of Lansing is beginning to look at our street conditions as a complete system, with the "right mix of fixes at the right time" approach to street repair and shifting away from emphasis on the "worst case first" approach to street repair projects; and

WHEREAS, Act 338 of the Sate of Michigan Public Acts of 2006 amends Act 51 of the Public Acts of 1951 and states in Section 6 that a city shall not transfer more than 50% of its annual major street funding for the local street system unless it has adopted and is following an asset management process for its major and local street systems; and

WHEREAS, once the City adopts and implements an asset management process, Act 338 allows unrestricted, flexibility for transferring between major street and local street funds based on the needs of the City; and

WHEREAS, the City of Lansing Public Service Department has drafted an asset management plan to assess current street conditions, set target funding levels, identify candidate projects, set priorities, develop a multi-year program, and report results; and

WHEREAS, the Public Service Department has presented the "Street System Asset Management Plan" to the Mayor and Council for review and recommended adoption of said plan;

NOW, THEREFORE, BE IT RESOLVED that the Lansing City Council hereby adopts the Street System Asset Management Plan as drafted April 27, 2007.

By Councilmember Jeffries

Motion Carried

LANSING CITY COUNCIL LEGISLATIVE ITEMS: JUNE 25, 2007 RESOLUTIONS