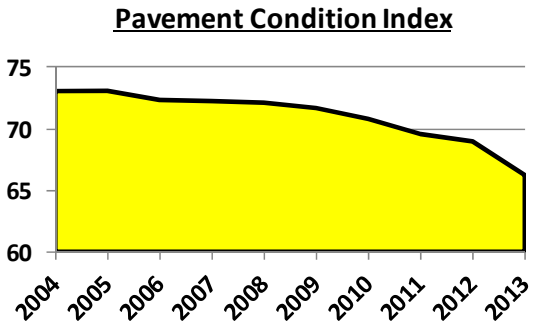

The City of Wichita's public street infrastructure is vital to its economy and quality of life. The condition of streets affects nearly every citizen, nearly every day. Proper maintenance of the street infrastructure is essential to protecting the City's capital investment and ensuring public safety. In recent years, an unfavorable trend has been noted, as evidenced by a steady decline in the City's average pavement condition index (PCI), which has fallen nearly 10% over the last 10 years. Maintaining the street network—which consists of more than 5,000 lane miles of paved streets and 169 lane miles of unpaved roads—is a priority for Wichitans. The ACT-ICT engagement effort revealed that street maintenance was among the top five public priorities. The ACT-ICT results are supported by findings from the 2013 Community Survey, which found that improving street maintenance was the second-highest priority, with 66.4% of respondents expressing a willingness to pay to address the issue.

Unpaved Streets

Wichita currently has 169 lane miles of unpaved street. Arterial and collector streets represent approximately 6.3% (or 10.6 lane miles) of this total. The balance of unpaved streets are residential. Most unpaved streets are in unimproved areas that were annexed by Wichita. However, some streets were developed before paving was required. Maintenance on an unpaved street will restore it to new condition immediately, although "new" condition is inferior to a well maintained paved street.

KSA 12-6a01 et. seq provides the authority for the City of Wichita to issue special assessment debt for specific projects and City Council Policy # 2 addresses the financing of public improvements. The policy requires that the original construction of local and collector streets be assessed 100% to property owners within the improvement district. In addition, the re-construction is also to be special assessed, provided the street has exceeded its anticipated useful life. Finally, constructing or reconstructing arterials is generally financed by GO at-large obligations, unless the arterial project is to provide paved access to a new development. Typically, improvements are initiated after the receipt of a petition signed by over 50% of the affected property owners. However, the City can order in necessary improvements, then assess the costs to property owners.

Development of Improved Pavement Modeling Approach

Often, the PCI is used to measure the condition of streets. While this measure is useful in comparing year to year conditions, it can be subjective. Staff have developed more appropriate ways to measure the quality of the City's streets, and these results have been validated by a professional, third-party review. These measures more accurately demonstrate the value of streets as a community asset, and the effectiveness of treatment options and capital investment strategies.

Remaining Service Life (RSL) - This measures the remaining life span of a street, in terms of lane miles. For example, simplistically a new four lane street that is one mile long might have an RSL of 160 (a hypothetical service life of approximately 40 years multiplied by 4 lanes by 1 mile equals a RSL of 160 lane

-mile-years). At the other end of the spectrum, a street that was near or past the end of its useful life would have an RSL value of 0 (generally at that point the street would be beyond preservation, and its value would be improved only through major rehabilitation or replacement). A higher RSL would indicate a network of newer streets. More importantly, an RSL value that is increasing would indicate streets are being improved over time and will serve the community further into the future. A declining RSL value would indicate that annual investments in streets are not keeping up with maintenance needs, and streets are deteriorating over time.

Network RSL - This is the total of the RSL (measured in lane mile years) for every City street. If every City street were brand new, this measure would be approximately 160,000 lane mile years.

Network Service Value - This equates the Network RSL to an estimated dollar amount. A network with a higher RSL would have a higher Network Service Value, as expressed in dollars. If every City street were brand new, this measure would be approximately $1.6 billion.

Return on Investment (ROI) - This measures the cost of treating a street compared to the increased service value of a street. Depending on the RSL of a street, and the type of treatment, the degree to which treatment expenditures can improve the RSL (and value) of a street will vary. Its primary benefit is in measuring the effectiveness of treatment options. It helps determine the treatments that will provide the most benefit.

With this new measurement structure, staff has modeled various treatment alternatives to determine, from an economic standpoint, the treatments that should be utilized for specific streets. In addition, the model is useful in objectively demonstrating the improvement in streets that would occur based on various levels of investment in maintenance. For example, using the current funding level and a 40-year time horizon, staff modeled the continuation of past strategies compared to the implementation of the new recommended strategies.

The model demonstrated that, with the current level of $8 million in annual funding, the City's street network would decline in value from the current $444.9 million to $79.6 million over the 40-year period. In addition, the current RSL value of 42,213 lane mile years would fall to 5,524 lane mile years. In other words, the continuation of past strategies with the current level of funding would result in a deterioration

Impact of Maintenance Strategies Over the Next 40 Years			
Maintenance Strategy	Network Service Value	Network RSL (Lane Mile Yrs)	Lane Miles at RSL = 0
	Current Street Network Measurements		
	$444,910,494	42,213	927
	Projected Street Network Measurements in 40 Years		
Past Strategies	$79,570,930	5,524	4,113
New Strategies	$458,300,618	42,898	2,729

of the Wichita street infrastructure in the long term. However, over the same period 40-year period, utilizing new strategies, the current level of funding would result in streets in basically the same condition as today, with the Network Service Value increasing by $14 million (to $458.3 million) and the RSL slightly higher at 42,898.

Options for Additional Improvements in Streets

Using the new model, street maintenance will be done more efficiently, matching treatment options to streets in the most efficient manner possible. However, the degree to which City streets improve is largely based on the dollars expended. As noted below, the current level of funding ($8 million annually) will essentially stabilize the street network over the long term. However, additional funding would allow further needed improvements to the network.

Additional $2 Million Annually - If an additional $2 million in Street Maintenance funding were provided annually, the Network Service Value would increase to $505.3 million. More significantly, the RSL of the City street network would increase to 46,772, in terms of lane mile years. The number of lane miles with an RSL equal to zero would decrease from 2,729 in the current funding model to 2,424.

Additional $8.3 Million Annually for Five Years - More improvements in City streets would be possible with a short-term infusion of $8.3 million for the next five years. With this additional funding (assuming base funding of $10 million annually), the Network Service Value would increase to $530.6 million, with the network RSL reaching 50,580 lane mile years. Finally, the number of lane miles with an RSL equal to zero would decrease to 2,384.

Impact of Additional Funding: Projected Street Network Measures			
Funding Level	Network Svc. Value	Network RSL (Lane Mile Yrs)	Lane Miles at RSL = 0
	Current Network		
Current Annual Funding of $8 million	$458,300,618	42,898	2,729
	2054 Projected Network		
$2 Million Increase in Annual Funding	$505,314,888	46,772	2,424
Additional $8.3 Million Increase in Funding for 5 Years	$530,590,519	50,580	2,384

Summary - Funding Gap

Based on the current sustainable level of maintenance funding of $8 million annually, utilizing an enhanced street maintenance approach, and using that approach strategically, the condition of Wichita streets can essentially be stabilized in the long term. However, coupling new strategies with additional funding would allow significant improvement in the City's street network. In other words, additional funding will have a direct impact on improving Wichita streets. In addition, effective maintenance that

preserves or prolongs the RSL of the City's street network can also have the positive effect of increasing efficiently and maximizing funds available for total street replacements.

While in theory an insatiable amount of funding could be utilized to ensure every street was maintained annually with no degradation in the RSL measurement, in practice it is more effective to manage the RSL in a manner that maximizes the condition of streets, minimizes the additional funding required, and ensures the funding is spent as effectively as possible. Increasing base spending from the current $8 million to $10 million annually would improve City streets, as reflected in the Network Service Value and RSL. Supplementing that level of funding with a short-term infusion of $8.3 million for five years would further improve City streets and the value of the City street network.

In addition to maintenance of paved streets, the estimated cost of improving unpaved quasi-arterial streets (streets classified as arterials and collectors by the Street Maintenance Division) to the City's minimum two-lane pavement standard is approximately $11.6 million. However, the actual costs could be higher, if the quality of improvements were increased, or if the street were more than two lanes wide. Additionally, certain streets, in particular those adjoining railroads and other utilities, may not be appropriate candidates for improvement. There are no City funds allocated for this purpose; paving currently unpaved quasi-arterial streets would require supplemental funding. In the past, based on City policy, nearly all unpaved streets that have been improved have been funded by special assessments. Using GO at-large funding for this purpose could create equity issues with property owners that either have or are currently paying special assessments for pavement projects.