KEY ELEMENTS TO DEVELOPING AND IMPLEMENTING AN ASSET MANAGEMENT CONDITION ASSESSMENT PROGRAM

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The Asset Management Journey

• Asset management means different things to different businesses.

• It is critical to remember that asset management is not about creating complex frameworks, or found in a software implementation.

• Only when a precise definition of what asset management means to your organization can a solid business case be developed.
Key Elements

- Leadership
- Expectations of deliverables from your asset management program
- Establishing data requirements that will be the backbone of your program
- Utilizing information to make decisions and for evaluating performance
Leadership

• The critical ingredient is achieving true ownership across all levels of the organization which requires a cultural shift, from functional to business centric.

• It is not the creation of a new job mindset across the organization but creating a new culture, competencies, and accountabilities.

“If you don’t know where you are going any road will get you there” –Lewis Carroll
Asset Management Expectations

• Multi-year efforts
• Setting the right priorities
• Sequencing the elements of the program.
• Realistic
• Identify elements of the program that can jumpstart the desired organizational changes
Maintenance Rating (Asset Condition Assessment) Programs and the Benefits
Maintenance Rating Programs

- Programs have been around for a while
- Approximately 28 states are active in collecting asset information
Understanding the program

- Programs generally report on assets based on a Level of Service (LOS) breakdown (A-F, 1-5, etc.)
- The LOS are generally based on an extrapolated quantity from “representative sampling”
- So what is representative sampling?
  - If 100% of your network cannot be assessed, then a statistically valid sampling or “representative sampling” of the network is conducted,
- The further you drill down in representative sampling the increase in sampling points
- Representation is very important for performance reviews
Representative Sampling Selection

Elements to consider:

- $z =$ Confidence Interval
- $e =$ Margin of Error
- $p =$ Expected Failure Rate (pass/fail rate)
- $N =$ Total potential segments to represent (based on segment length)
- $n =$ Required representative segments

$$n = \frac{(z^2)(p)(1 - p)}{e^2 + \frac{(z^2)(p)(1 - p)}{N}}$$
It all connects

Lets run through a scenario:

• If you set your confidence interval to 95% and your margin of error to 5%

• You are implying that you are 95% confident that you will get the same results within +/- 5% if you were to conduct the sampling again.

• So why does this matter?
It all connects

If the LOS ranges are “narrow” then you lose the reliability of the sample data.

Example: If the following LOS breakdown for an asset using 95% Confidence Level with a 5% Margin of Error is:

LOS A (0% - 2%);  LOS B (2% - 4%);  LOS C (4% - 6%)
LOS D (6% - 8%);  LOS F (>8%)

If my data resulted in 5% corresponding to a letter grade of C. Based on the parameters set it could actually be LOS A or LOS F due to the margin of error it can be as low as 0% or as high as 10% if the sampling was conducted again.
It all connects

Level of Service Chart

- LOS A
- LOS B
- LOS C
- LOS D
- LOS F

Margin of Error +5%

Margin of Error - 5%

LOS = 5%
It all connects

• LOS ranges should be established with the margin of error in mind.

• Example: If the following LOS breakdown for an asset using 95% Confidence Level with a 5% Margin of Error is:
  LOS A (0%-5%);  LOS B (5%-10%);  LOS C (10%-15%)
  LOS D (15%-20%);  LOS F (>20%)

  ❖ If my data resulted in 5% corresponding to a letter grade of A. Based on the parameters set it could be LOS A or LOS B.
It all connects

Level of Service Chart

Margin of Error +5%

Margin of Error - 5%

LOS = 5%
Utilizing Results
Results

Elements that help budgeting processes:

- Having a established and well defined maintenance activity list that has established unit rates

- Ensuring the assessment criteria matches units of measure for the corresponding maintenance activity

- Knowing the average the unit rates for the activity (knowing contractor rate verses in-house rates)
Results

The Results can inform you on:

• What activities may need more scheduled work

• The condition of your assets

• Approximate spend in meeting a desired target

• How you are performing
Results

Results are not intended to:

- Tell personnel how to manage crews
- Where locational (X,Y) to conduct work activities
- Tell you a mandatory spend
Warning Signs Asset Condition

<table>
<thead>
<tr>
<th>Level of Service</th>
<th>District</th>
<th>CRITICAL</th>
<th>HIGH</th>
<th>LOW</th>
<th>MEDIUM</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td>3.201</td>
<td>4.247</td>
<td>0</td>
<td>1.750</td>
<td>9.197</td>
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<tr>
<td></td>
<td>3</td>
<td>320</td>
<td>360</td>
<td>0</td>
<td>318</td>
<td>1,007</td>
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<tr>
<td>Score</td>
<td></td>
<td>18.75 %</td>
<td>7.69 %</td>
<td>0.00%</td>
<td>26.57 %</td>
<td>16.95 %</td>
</tr>
<tr>
<td>LOS</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td></td>
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</tbody>
</table>

Cost Breakdown

<table>
<thead>
<tr>
<th>Priority</th>
<th>Zero Deficiency</th>
<th>LOS 1</th>
<th>LOS 2</th>
<th>LOS 3</th>
<th>LOS 4</th>
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<tbody>
<tr>
<td></td>
<td>$114,422</td>
<td>$77,541</td>
<td>$40,661</td>
<td>$3,780</td>
<td>($33,100)</td>
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</table>
Representation for Performance Reviews

• At what level do you evaluate personnel on performance depends on the level of the data represents
  
  o For Example: My agency conducts condition assessments that are statistically representative at the District Level.

  ➢ Can I hold a County Maintenance Supervisor accountable for meeting a desired LOS target when my data is not representative at the county level?
Evaluating Performance

Data/Information can be used differently at various levels in the organization:

For a Crew Member – Did I perform the required units that was identified to me?

For a County Foreman- Did I manage resources to the proper activities that was identified to me?

For a Area Engineer- Am I directing work to the appropriate activities that corresponds to where the LOS is lagging or excelling?

For a District Engineer- Did I allocate the appropriate funds and communicate to the Area Engineer where the LOS was lagging or excelling?

For a State Engineer – Am I providing the Districts with the appropriate funding level to allows the to achieve the desired LOS?

For a Commissioner – Am I securing the proper funding level to achieve the desired LOS statewide?
Important Takeaways

• It is a Journey

• Change is not EASY

• If the organization does not understand and embrace the changes, the success of an asset management program will never be fully realized.

• An Asset Condition Rating Program is only a piece of Asset Management within your organization.

• Communication, Communication, Communication