Levels of Service

Putting the Wheels in Motion

Michigan Transportation Asset Management Council

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Introduction

Managing Expectations

• This topic may be simple or complicated depending on the asset system, size or geography, demography, or agency demands.
• This presentation is only sharing Level of Service opinions based on Asset Management expertise and experience.
• The actual development and implementation is the responsibility of the agency for which we are open to providing professional assistance.
• All presentation content is for illustration only.

*Feeling comfortable with legacy programs or overwhelmed by the concept of AM? The goal is to experience a mindset growth and shift to a new paradigm. The data and artifacts agencies already have may be surprising.*
Levels of Service

Two Basic Questions to ask:

• What must the asset system achieve?
  ➢ Based on regulatory, operational safety, and technical requirements
• What do stakeholders desire the asset system should achieve?
  ➢ Based on stakeholder input; Strategic Objectives

Levels of Service should:

• Define statements consistent with Organizational Context/Policy
• Establish realistic measurable target goals
• Validate and seek approval with stakeholders
• Document
• Create dashboard for transparency
### Asset Management Readiness Scale

#### Section 5 - External Communication and Knowledge Sharing

**Current State**

<table>
<thead>
<tr>
<th>Outcome areas</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>C: External Communication and Knowledge Sharing</td>
<td>![Checkmark]</td>
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<tr>
<td>Describe Current Actions</td>
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<tr>
<td>We are seeking ways to increase transparency and educate our citizens/customers about AM.</td>
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<td>Elected officials and/or senior management use ad-hoc methods to share basic information on current capital projects with the public.</td>
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<tr>
<td>Elected officials share and/or senior management regularly share basic information on our assets, the services we provide, and future needs with our citizens/customers in a systematic way (e.g. publishing and communicating our Asset Management Plan).</td>
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**Future State**

- **Selected Level:** 0

**Describe Planned / Potential Actions**

- We are a leader on AM within our service area sector.
- We are active in coaching other organizations to improve the overall body of AM knowledge.
- We communicate the benefits of AM to our citizens/customers.
## Asset Management Readiness Scale
### Section 4 - Planning and Decision-Making

### Current State

<table>
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</thead>
<tbody>
<tr>
<td>B: Asset Management Plans</td>
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<tr>
<td></td>
<td></td>
<td>We have <strong>AM plans</strong> for critical services, based on a mix of estimated and actual data.</td>
<td></td>
<td>We have <strong>AM plans</strong> for most services based on actual data.</td>
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<tr>
<td></td>
<td></td>
<td>We have draft <strong>AM plans</strong> for some asset classes, with forecasted financial needs based on estimated data.</td>
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<td>We evaluate priorities based on available information, staff experience, and input from senior management.</td>
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<tr>
<td></td>
<td></td>
<td>Our <strong>AM plans</strong> include available information about level of service (current and target) and risk management.</td>
<td></td>
<td>Our <strong>AM plans</strong> include basic needs forecasting and risk management strategies for critical assets.</td>
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<td></td>
<td>Our <strong>AM plans</strong> are based on both short- and long-term issues and priorities. They balance short-term service objectives with longer-term goals and risks.</td>
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<td>We keep our <strong>AM plans</strong> up to date through normal business.</td>
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</tbody>
</table>

### Future State

| Current (from left) | Select the level you expect to achieve in | Year 1 | Year 3 | |
|---------------------|-----------------------------------------|-------|-------| |
| 0                   | Describe Planned / Potential Actions    |       |       | |
**Asset Management Strategy**

**From the Global Forum on Maintenance and Asset Management (GFMAM) Strategic Objectives & LOS Relationship**

**Definition:**
The strategic plan for the management of the assets of an organization that will be used to achieve the organizational / corporate objectives.

**Context:**
The Asset Management Strategy describes the long-term approach to management of the physical assets. It would typically include a set of strategic statements that describe the current and future service levels the organization is planning to deliver and the current and future Asset Management capabilities that the organization needs in order to sustainably deliver these outcomes.

The Asset Management Strategy would typically include:

- Asset management objectives based upon scenario analyses that includes measureable objectives on the expected economic, environmental and social performance of an organization's asset portfolio.
- Key accountabilities for both the activities covered by the Asset Management Strategy and for the implementation and ongoing maintenance of the Asset Management Strategy.
- The decision-making criteria that are used to undertake lifecycle cost and risk analysis to determine the optimum asset interventions,
- How the organization will develop its asset information to support such analysis and how the organization will manage uncertainty associated with its asset information
- A reference to the overall Asset Management System that describes the management system that the organization has implemented / is implementing including a description of how the Asset Management Strategy fits into the AM management system.
- The methodology for determining asset and network criticality.
Organizational Context

• Vision, Mission, Values Statements
• L-T Strategic Plan with Objectives
• Community Master Plan
• Policy
• Sustainability Goals

A good start is to translate and use to assist in formation of Levels of Service definitions and targets
Here's an example:

**Value Statement**
Wise Stewards of Transportation Funding

**Strategic or Business Objectives**
Utilize a Lifecycle Approach

**SMART Objectives**
- **Objective #1:** Optimize Cost
- **Objective #2:** Optimize Risk
- **Objective #3:** Optimize Performance

**LOS Targets**
- **Task 1:** 10% Annual Reduction in Project Delivery
- **Task 2:** Track TCO on all projects in 5 years
- **Task 3:** 70% Good/Fair Roads
- **Task 4:** 50-year Replacement Life

*Do these LOS targets invite risk or opportunity?*
Disproportionate Feeling of LOS

**Stakeholder Expectations**
Wants & Voice of Frustration

**Technical Ability**
Doing it the same way

**Resource Capability**
Reactive, Daily "Firefighting", Lack of Funding
Proportionate or Balanced LOS Approach

Realistic Expectations
Strategic Objectives
Stakeholder Designed

Technical Ability
Configure Activity to Technology,
Track Performance

Resource Capability
Activity, Staffing-levels,
Prioritization, Funding,
Science & fact based
Real-Time Level of Service

Informs on what the public is experiencing based on their calls into an agency:

- 311 System enables:
  - Visual analytics
  - Heat maps
- Work Order (CMMS) System
  - Download and organize into patterns and themes.
  - If necessary, configure system into reasonable work tasks to enable simplified organization and discernment.
  - Review to perhaps incorporate into risk registry, if you have one. (MOST UNDERVALUED)

Real-time LOS enables agencies to identify the gap in the desired LOS
Know your Stakeholders & their Desired Level of Service

Scalable based on your geography and representation – Let’s talk about this

• Urban versus rural
• Industry type
  • Industrial
  • Business/Commercial
  • Agricultural
  • Logging
  • Tourism
Stakeholder Process

- Streets Task Force
- Governing Body Adoption of Recommendations
- Streets Committee for O/M/CIP Steering
Designed LOS – Streets 101

- Educate & Engage Stakeholders for they may smart unlock valuable insight!
- Leverage a facilitator
- Take stakeholders through an education process
  - Previously adopted Community Master Plan & Organizational Context
  - ROW Assets By the Numbers! What we have, what condition.
  - Street classification system, terminology, multi-modal types
  - Engineering, technical, safety, regulatory constraints
  - Operations & Maintenance – what we do daily and why
  - Funding – where the funds originate and how we fiscally budget, restrictions
  - Street CIP process – how projects are prioritized
Stakeholder-Designed LOS

- Multiple discussion opportunities to identify Stakeholder Objectives
- 50, 60, 70, 80, 90, or 100% Good and Fair Level of Service?
- Prioritization Process. Which streets specifically? Which asset types?
- Assist with taking the temperature of stakeholder appetite and tolerance for funding a pace of attaining certain LOS goals.
- Tradeoffs with constraints and multi-modal asset types.
- Agency presented scenarios with funding gaps.
- Alignment with community master plans and organization context.
**Grand Rapids Example**

**Story Board**

**Condition**

**Types of Streets**

- Federal Aid Urban
  - Major Streets w/Grants: 60% Good, 40% Fair
  - Non-Fed Aid Urban
    - Major Streets w/Grants: 62% Good, 38% Fair
    - Neighborhood Residential: 69% Fair, 31% Poor

- Current State of All Grand Rapids Streets: 371 miles (out of 586)

**Just How Bad?**

- 2002: 60% Fair to Good, 60% Poor
- 2012: 87% Poor
- 2019: Only 8% of our streets are in good condition

**Our Goal:** 70% Good Repair

**What's Needed?**

- $22 million a year ($216.6 million over 23 years)

**Time = Money**

- The number of miles we can complete per $1 million decreases as the cost of the fix increases. The longer we wait, the more our streets deteriorate.

**1 Million: What Do You Get?**

- Type of Fix
  - Durapatch Crack Seal: 436
  - Gap Seal: 389
  - Rehab: 36
  - Major Reconstruction: 4

- As time passes, heavy maintenance, light rehab, heavy rehab, and major reconstruction.
Current LOS

- Current LOS based on PASER surface ratings collected by regional Metropolitan Planning Organization (MPO) - Grand Valley Metro Council
Stakeholder-Designed LOS

Identify & facilitate representative stakeholder group to develop recommendations – may take a few attempts.

Don’t forget to engage these groups too!
- Local DOT
- County Road Commission
- Local Supply Chain Industry
- Schools
- Cyclists
- Pedestrians

Engagement & Input
Diverse & inclusive task force representation of public and private stakeholders.

Take the show on the Road!
- Transparency
- Feedback
- Validation
- Empower both Citizens and the Stakeholder Group
What is your Resource Capacity LOS?

• Question?
  • What is the resourcing strategy to delivery assets based on their desired LOS?

• Answer?
  • Determine the capacity necessary for a Lifecycle Delivery or Whole Life approach.
Basic Taxonomy

Institute of Asset Management Concept Model for Asset Management.
Basic Taxonomy

• 39 Landscape Subjects of the Asset Management conceptual model.
What is your Resource Capacity LOS?

• Operational
  • Traditional LOS values based on traffic volumes
  • Snowplowing – assuming this topic has well-defined LOS targets and definitions based on the public demands and school bus routes, etc.
  • Drainage systems – are they clean and do they work to a defined LOS target?
  • Vegetation Management
  • Signage
  • Pothole Patching
  • Reliability Engineering
Resource Capacity – Lifecycle Delivery Subjects

- Reliability Engineering – the process for ensuring that an item shall operate to a defined standard for a defined period of time in a defined environment.
  - Defined standard may be FWHA or DOT required, safety required, and LOS desired.
- Operational Maintenance – 311 heat mapping, ADT, Work Order History
- Maintenance Delivery – PASER Values that drive preventive maintenance
- System Engineering, corridors act and deliver as a system, complete intersections may be considered as part of this concept.
  - Funding issues, then prepare a proper scope of work in the beginning and revisit the SOW before submitting for final funding and land acquisition requests.
  - GOGR and MDOT Summit meeting.
- Configuration Management – Scheduling preventive maintenance based on Levels of Service
Examples to determine Resource Capacity LOS

• Developing appropriate Resourcing Strategies
• Managerial & Staffing Capacity Gap Analysis
• Process Optimization – Lean Management
• Integrated Operations
• Technology
• Asset Management
• Capital Project Delivery Excellence
Technical Influence on the Lifecycle Spectrum

- Capital Investment Decision-Making
- Asset Creation & Acquisition
- Asset Commissioning
- Asset Operations
- Maintenance Delivery
- Asset Reuse Recycle Replacement
- Total Cost of Asset Ownership

Technical LOS Influence
Technical Ability - Condition vs Replacement

Some ROW asset components may be replaced based on condition

- **Sidewalks and crosswalks:**
  - Prioritization may be based on traffic/pedestrian counts and safety since likely cannot fund all at once or maintain LOS A 100% of the time.
    - Preferably define the LOS statements & quantitative targets with stakeholders
    - Downtowns, school routes, high-density areas, etc., may require higher LOS and prioritization than others.

- **Pavement Systems and bridges:**
  - PASER values become the KPI while LOS is years before replacement.
  - Airports pavement systems use this type of AM methodology.
    - Forces a culture of Asset Management rather than “Managing Assets”

*Replacement Life – Optimization mindset approach rooted in an AM Policy that commits an agency to fund its street program based on Lifecycle Delivery principles*
Technical Ability – System v. Component

• Some component groups may have LOS values based simply on age.
  • Pavement striping
  • Signage

• Certain ROW systems that have several components cost too much to record and track condition, therefore, replace by age.
  • Determination on the age and review the cost scenarios with each age limit, which will be your LOS.
  • P-D-C-A based on your initial LOS and adjust over subsequent fiscal years.

Think Optimization - No need to make this complicated.
Examples of Improving Technical LOS

- Create clear opportunities to consider products, materials, components, and systems
- Run Lifecycle Analysis, Total Cost of Ownership (TCO) scenarios, & Risk Assessments in Preliminary Design
- Properly hand-off from construction to O&M configuration
- Specification Standardization
- Continuous improvement for better designs
  - Practice Lessons Learned with stakeholders
- Leverage as a scope of work task in RFPs

Strengthen language in RFPs and PSAs for strategic project planning before jumping to engineering solutions
Strategy Implementation

- Use the science
- Leverage Roadsoft or computerized maintenance and management system
- Implement annually strategies that work towards level of service goals.
LOS - Asset Data Quality?

• Where are the gaps in the data to attain LOS goals?
• What data gaps require the greatest priority in closing?
• What is the schedule to close all gaps and to what milestones for each target level?
• What is the cost to close the gaps, ROI, and at which targets?
  • For example, it may not be required to achieve greater than 90% of accurate and complete asset data in certain areas based on cost and risk.
Thank you! What questions do you have?

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