Levels of Service

Putting the Wheels in Motion

Michigan Transportation Asset Management Council

September 26, 2023

Mark DeClercq, PE,
MIAM, AMP
Applied Asset
Management Consultants

Email: madeclercq66@gmail.com

info@appliedasset.com

Telephone: 269.870.0721

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

Michigan Infrastructure Council

Current State

Outcomes: Select the outcomes that your organization has achieved.

Outcome areas	Level 1	Level 2	Level 3	Level 4	Level 5
C: External Communication and Knowledge Sharing	We are seeking ways to increase transparency and educate our citizens/customers about AM.	Elected officials and/or senior management use ad-hoc methods to share basic information on current capital projects with the public.	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).	Elected officials and/or senior management educate our citizens/customers on the connection between funding (including taxes, rates, and millage/bonds), infrastructure spending, and public services.	Elected officials and/or senior management engage our citizens/customers on our **level of service** and gather public preference through consultation mechanisms.
				We share information with our peers on our experience, innovations and lessons learned.	We are a thought 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.
Describe Current Actions					

Future State

Current (from left)	Select the level you expect to achieve		
	Year 1	Year 3	Year 5
0			
Describe Planned / Potential Actions			

Current State

Future State

Outcome areas	Outcomes: Select the outcomes that your organization has achieved.						Current (from left)	Select the level you expect to		
	Level 1		**Level 2**		**Level 4**	**Level 5**		**Year 1**	**Year 3**	
B: Asset Management Plans	☐ Our approach to asset renewal focuses on addressing immediate needs (e.g. growth, regulations and known problems).	☐ We have draft **AM plans** for some asset classes, with forecasted financial needs based on estimated data.	☐ We have **AM plans** for **critical services**, based on a mix of estimated and actual data.	We have **AM plans** for most services based on actual data.	We have **AM plans** for all services based on actual data.		**0**			
			☐ Our **AM plans** include available information about **level of service** (current and target) and **risk** management.	☐ Our **AM plans** include basic needs forecasting and **risk** management strategies for **critical assets**.	Our individual **AM plans** are integrated across services.		Describe Planned / Potential Actions			
	☐ We evaluate priorities based on available information, staff experience, and input from senior management.		☐ Our **AM plans** identify short-term issues and priorities.	☐ Our **AM plans** are based on both short- and long-term issues and priorities. They balance short-term service objectives with longer-term goals and **risks**.	Our **AM plans** include needs forecasts and risk management strategies for most assets. Plans address **risks** to both service and business goals					
				☐ We keep our **AM plans** up to date through normal business.						

Asset Management Strategy

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.
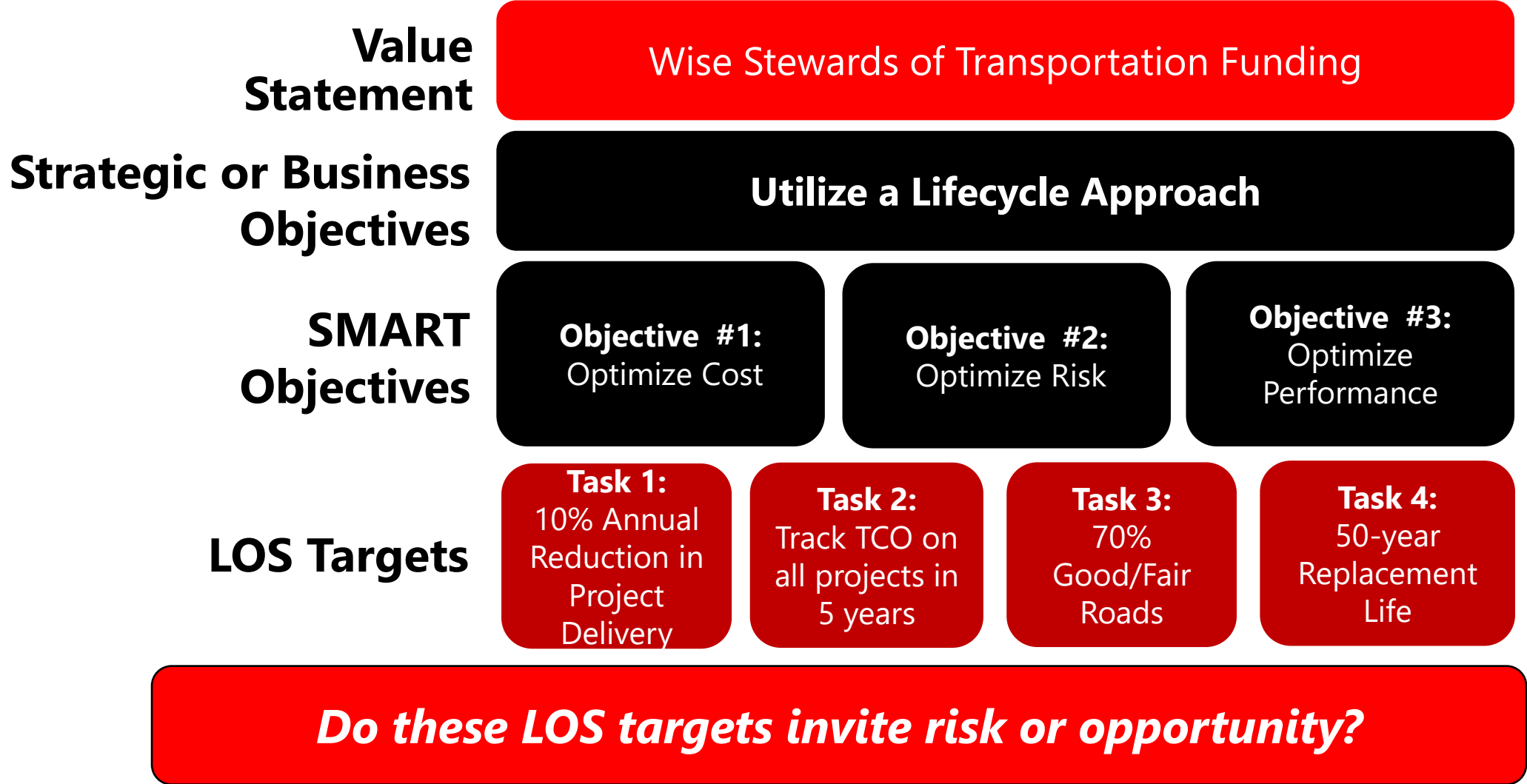- The methodology for determining asset and network criticality.

Organizational Context

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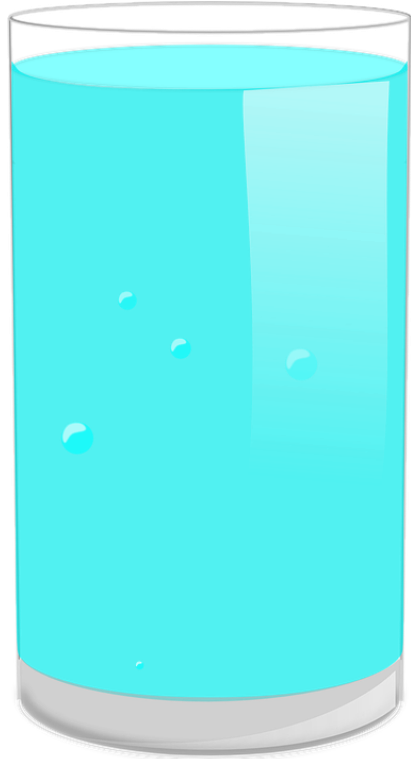- Community Master Plan
- Policy
- Sustainability Goals

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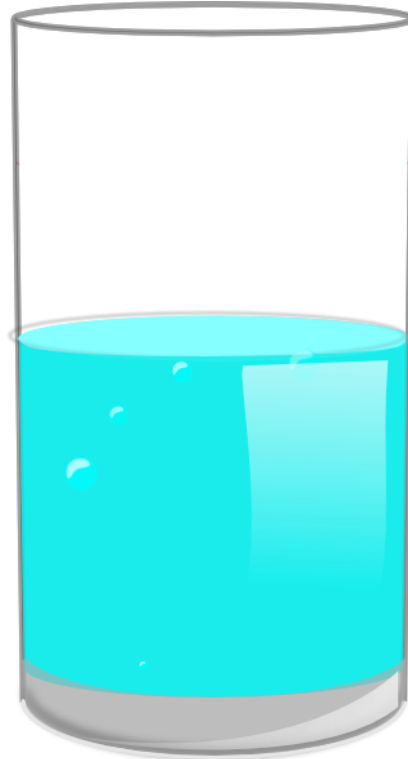
Here's an example:

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
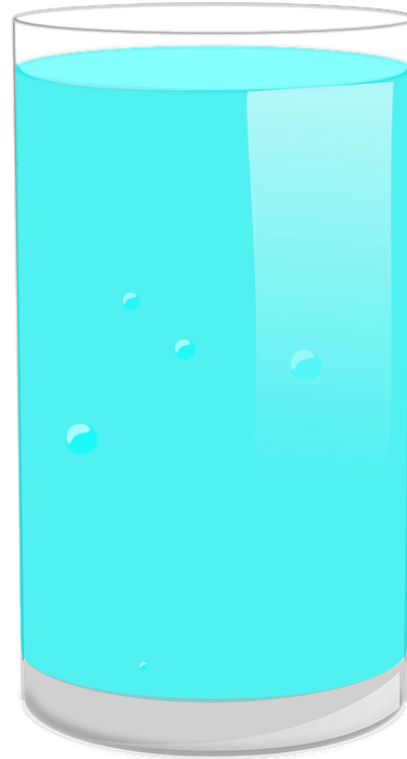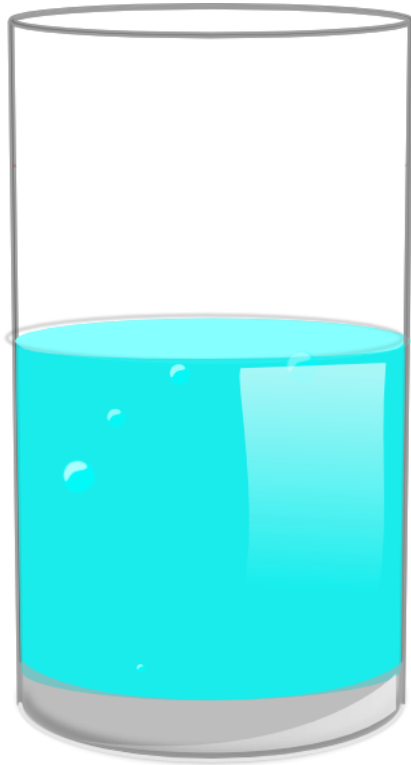Wants & Voice of Frustration

Technical Ability
Doing it the same way
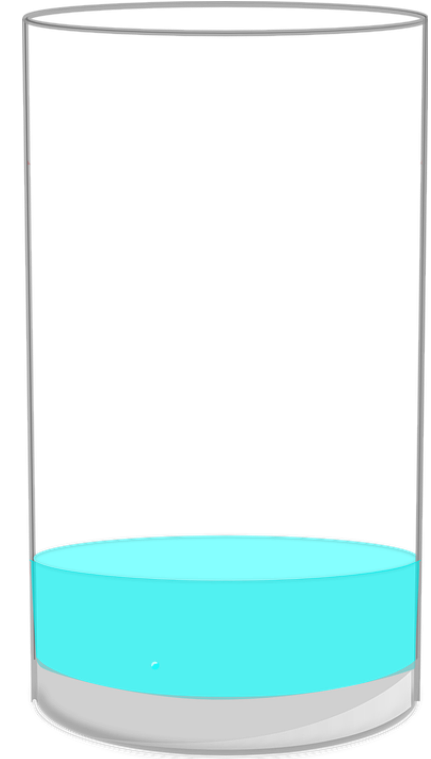
Resource Capability
Reactive, Daily
"Firefighting",
Lack of Funding

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
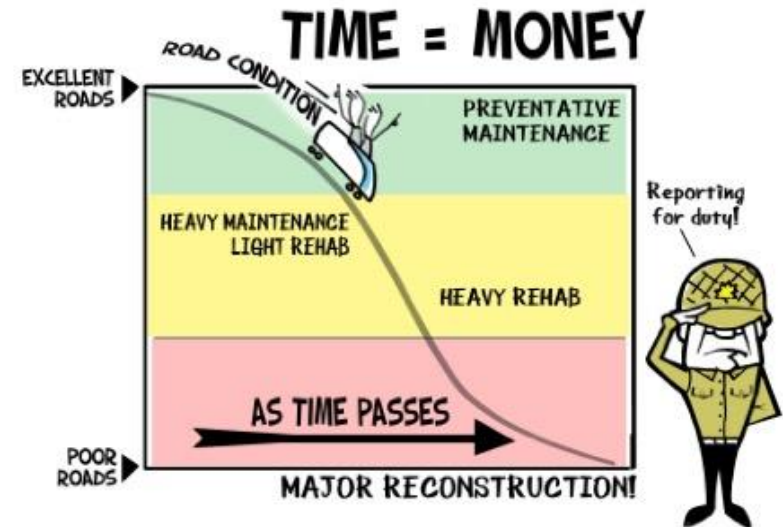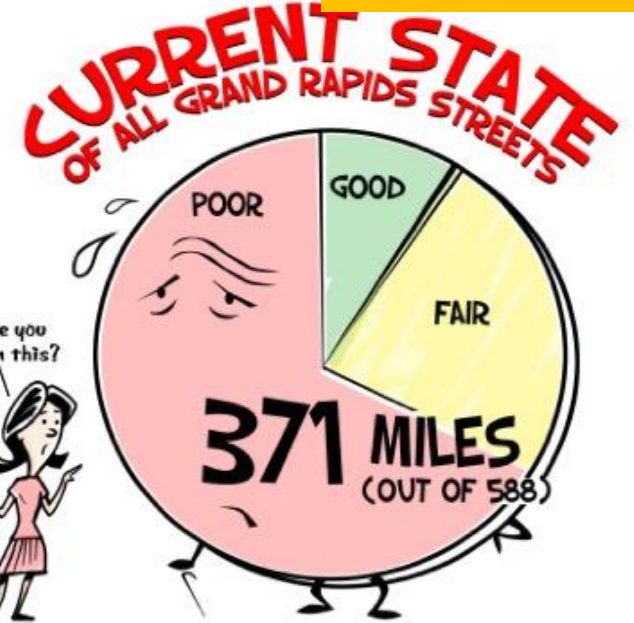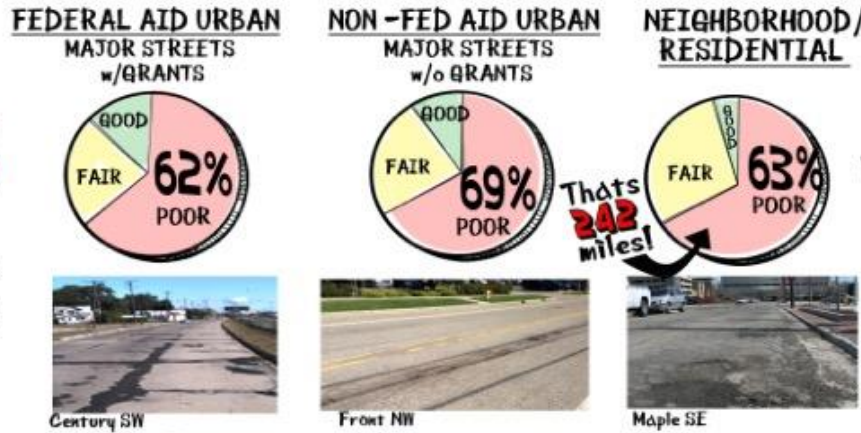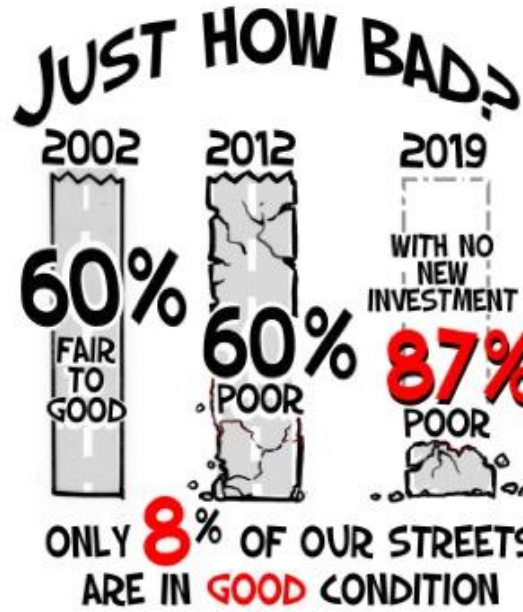
Stakeholder-Designed LOS

- 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.

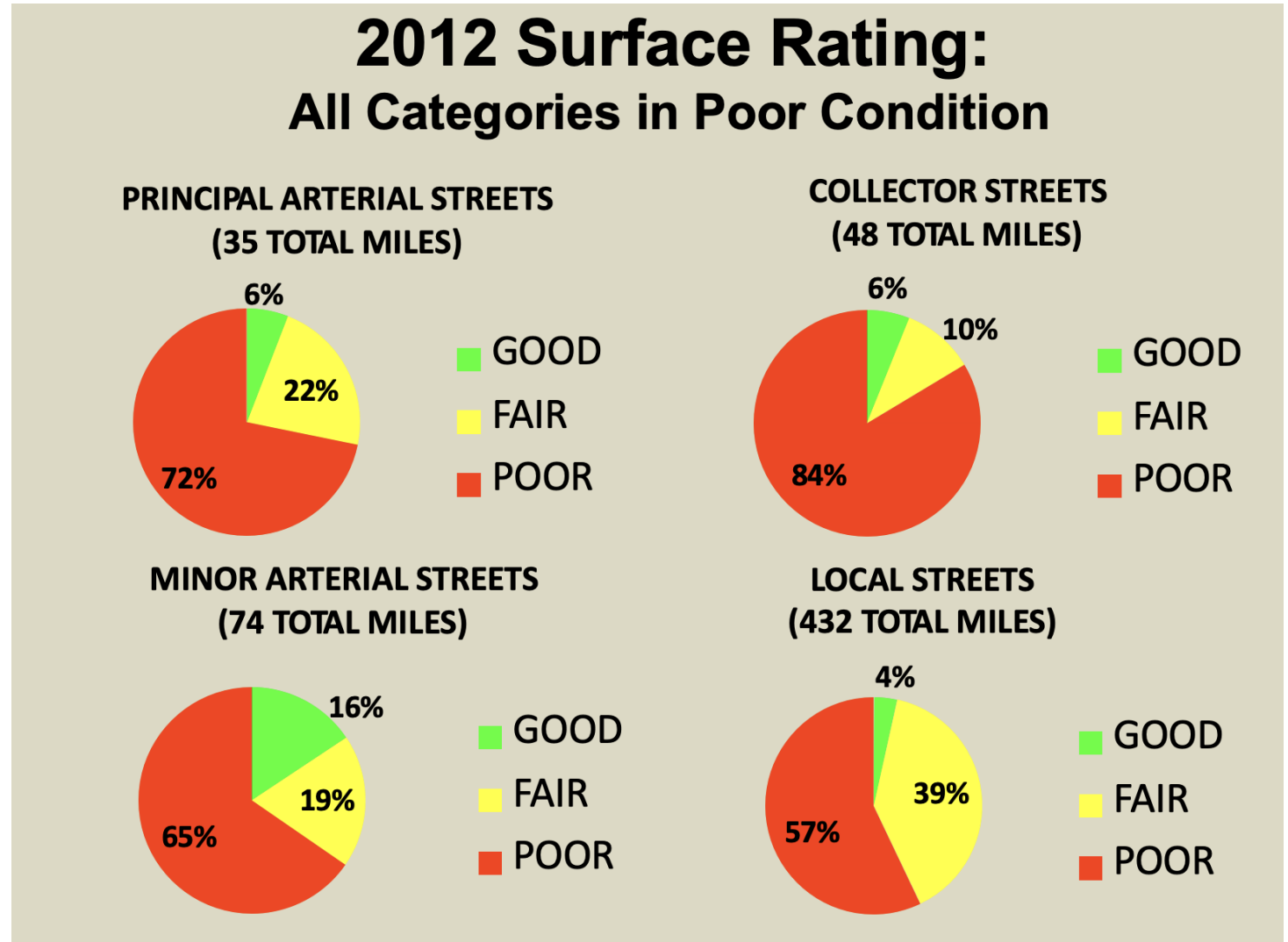- Alignment with community master plans and organization context.
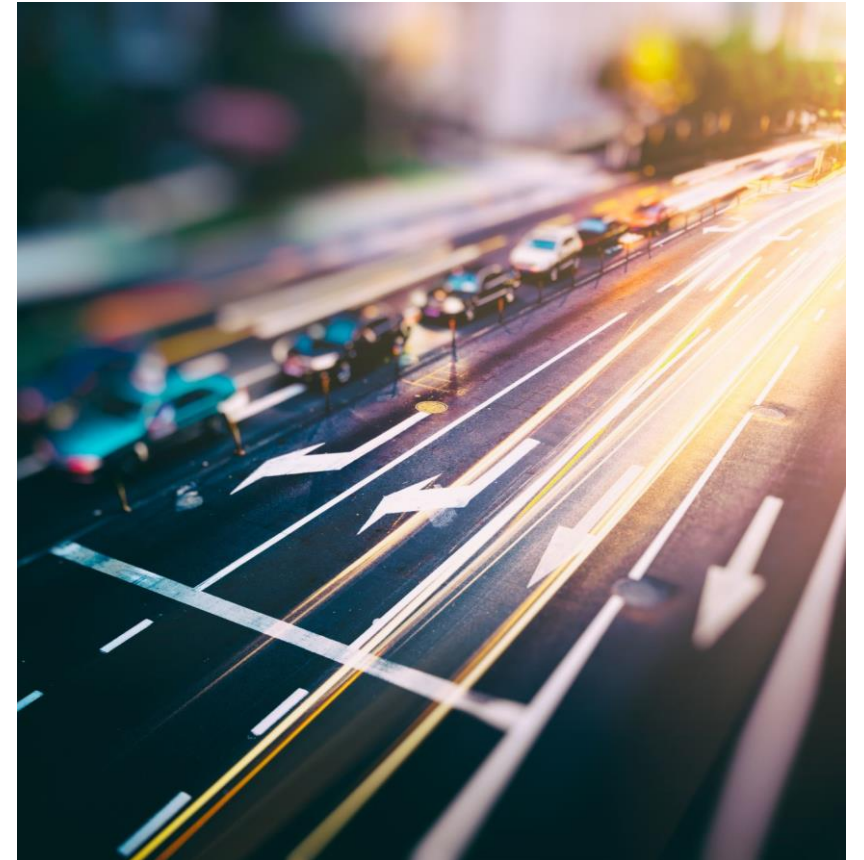
Current LOS

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

2012 Surface Rating:
All Categories in Poor Condition

PRINCIPAL ARTERIAL STREETS (35 TOTAL MILES)

6%
22%
72%

GOOD
FAIR
POOR

COLLECTOR STREETS (48 TOTAL MILES)

6%
10%
84%

GOOD
FAIR
POOR

MINOR ARTERIAL STREETS (74 TOTAL MILES)

16%
19%
65%

GOOD
FAIR
POOR

LOCAL STREETS (432 TOTAL MILES)

4%
39%
57%

GOOD
FAIR
POOR

Stakeholder-Designed LOS

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

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
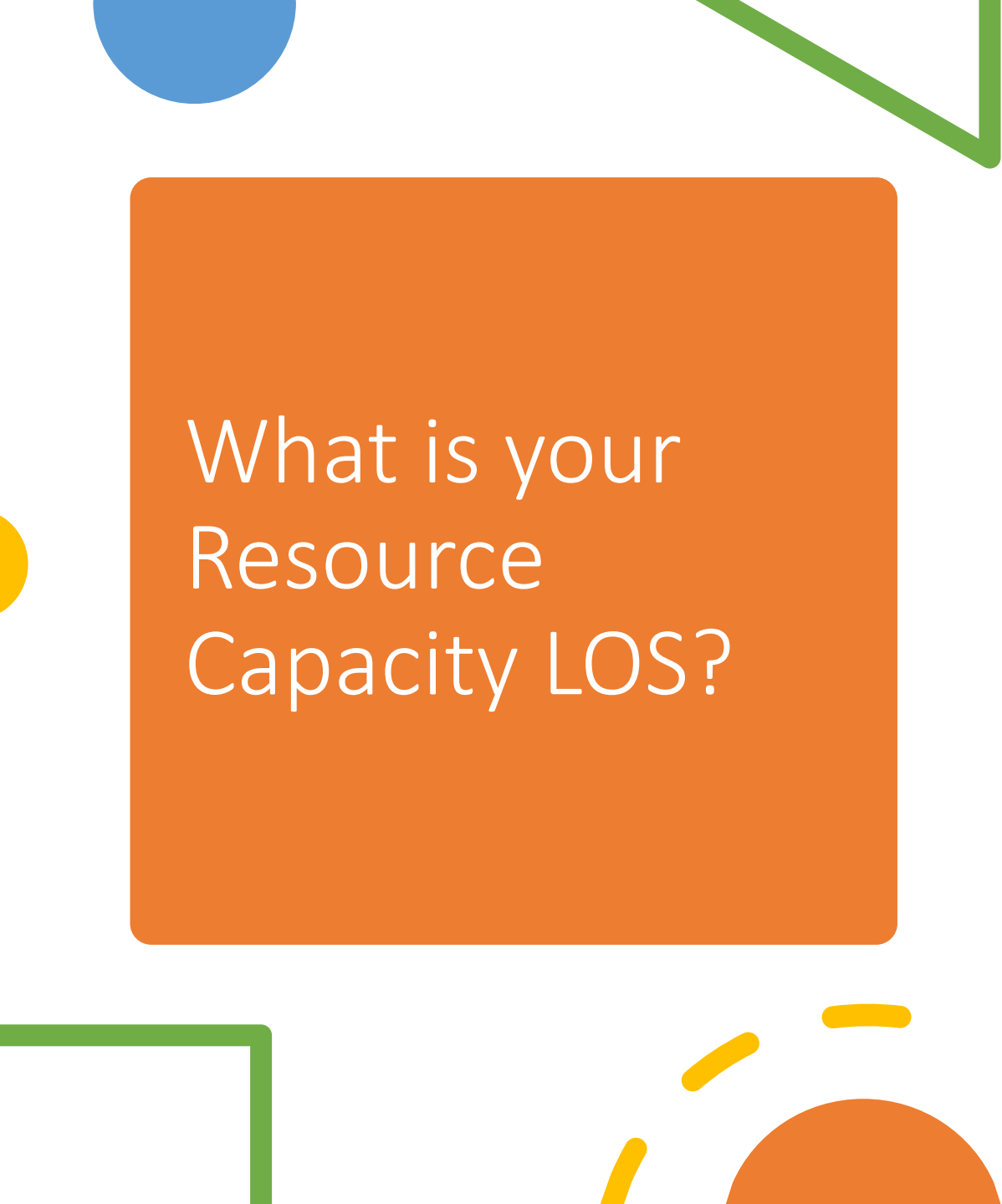
Don't forget to engage these groups too!

Local DOT

County Road Commission

Local Supply Chain Industry

Schools

Cyclists

Pedestrians

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.

Institute of Asset Management Concept Model for Asset Management.

Basic Taxonomy

© Copyright 2014 Institute of Asset Management (www.theIAM.org/copyright)
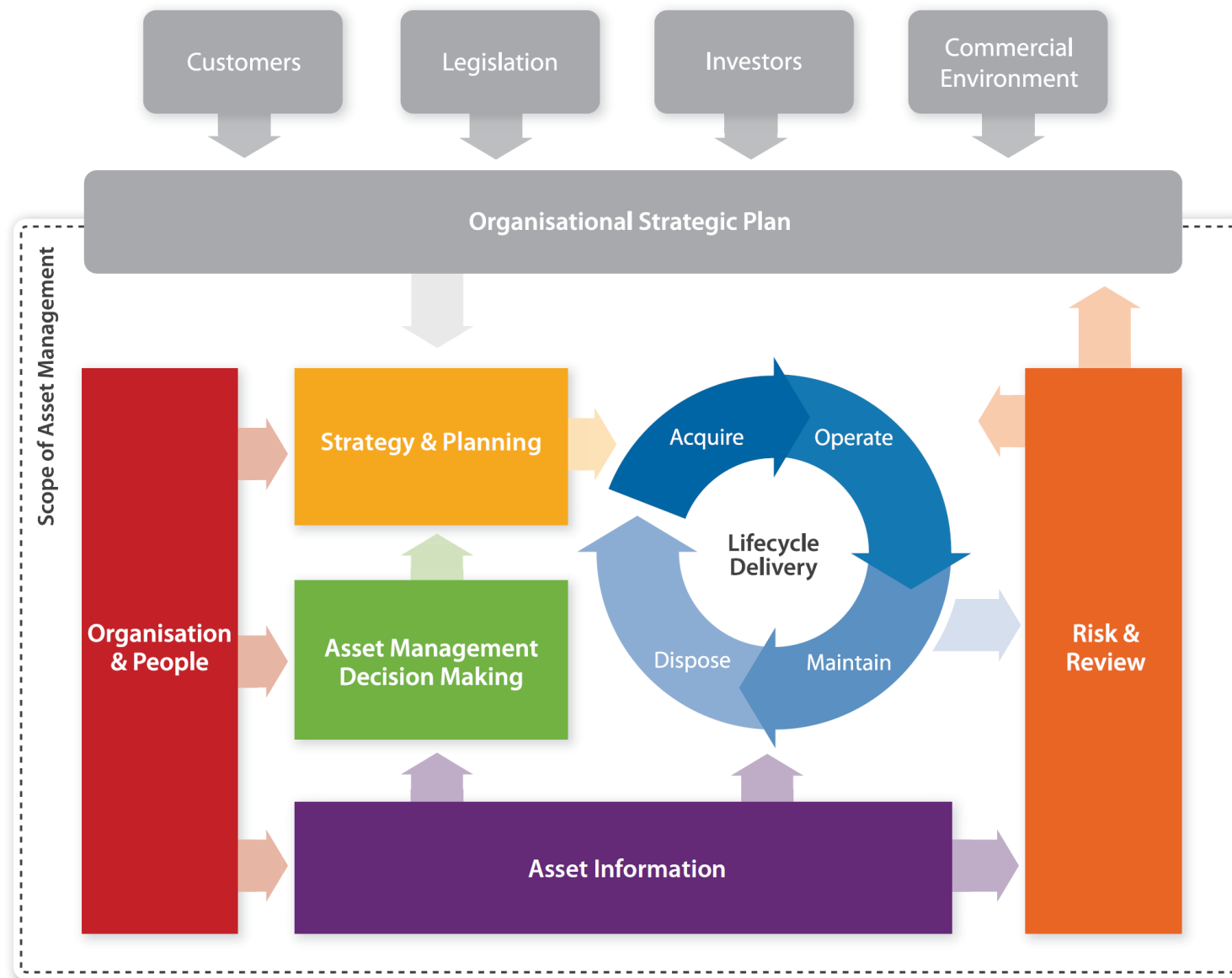
Basic Taxonomy

- 39 Landscape Subjects of the Asset Management conceptual model.

Group 1 - Strategy & Planning

1. Asset Management Policy
2. Asset Management Strategy & Objectives
3. Demand Analysis
4. Strategic Planning
5. Asset Management Planning

Group 2 - Asset Management Decision-Making

6. Capital Investment Decision-Making
7. Operations & Maintenance Decision-Making
8. Lifecycle Value Realisation
9. Resourcing Strategy
10. Shutdowns & Outage Strategy

Group 3 - Life Cycle Delivery

11. Technical Standards & Legislation
12. Asset Creation & Acquisition
13. Systems Engineering
14. Configuration Management
15. Maintenance Delivery
16. Reliability Engineering
17. Asset Operations
18. Resource Management
19. Shutdown & Outage Management
20. Fault & Incident Response
21. Asset Decommissioning & Disposal

Group 4 - Asset Information

22. Asset Information Strategy
23. Asset Information Standards
24. Asset Information Systems
25. Data & Information Management

Group 5 - Organisation & People

26. Procurement & Supply Chain Management
27. Asset Management Leadership
28. Organisational Structure
29. Organisational Culture
30. Competence Management

Group 6 - Risk & Review

31. Risk Assessment & Management
32. Contingency Planning & Resilience Analysis
33. Sustainable Development
34. Management of Change
35. Asset Performance & Health Monitoring
36. Asset Management System Monitoring
37. Management Review, Audit & Assurance
38. Asset Costing & Valuation
39. Stakeholder Engagement
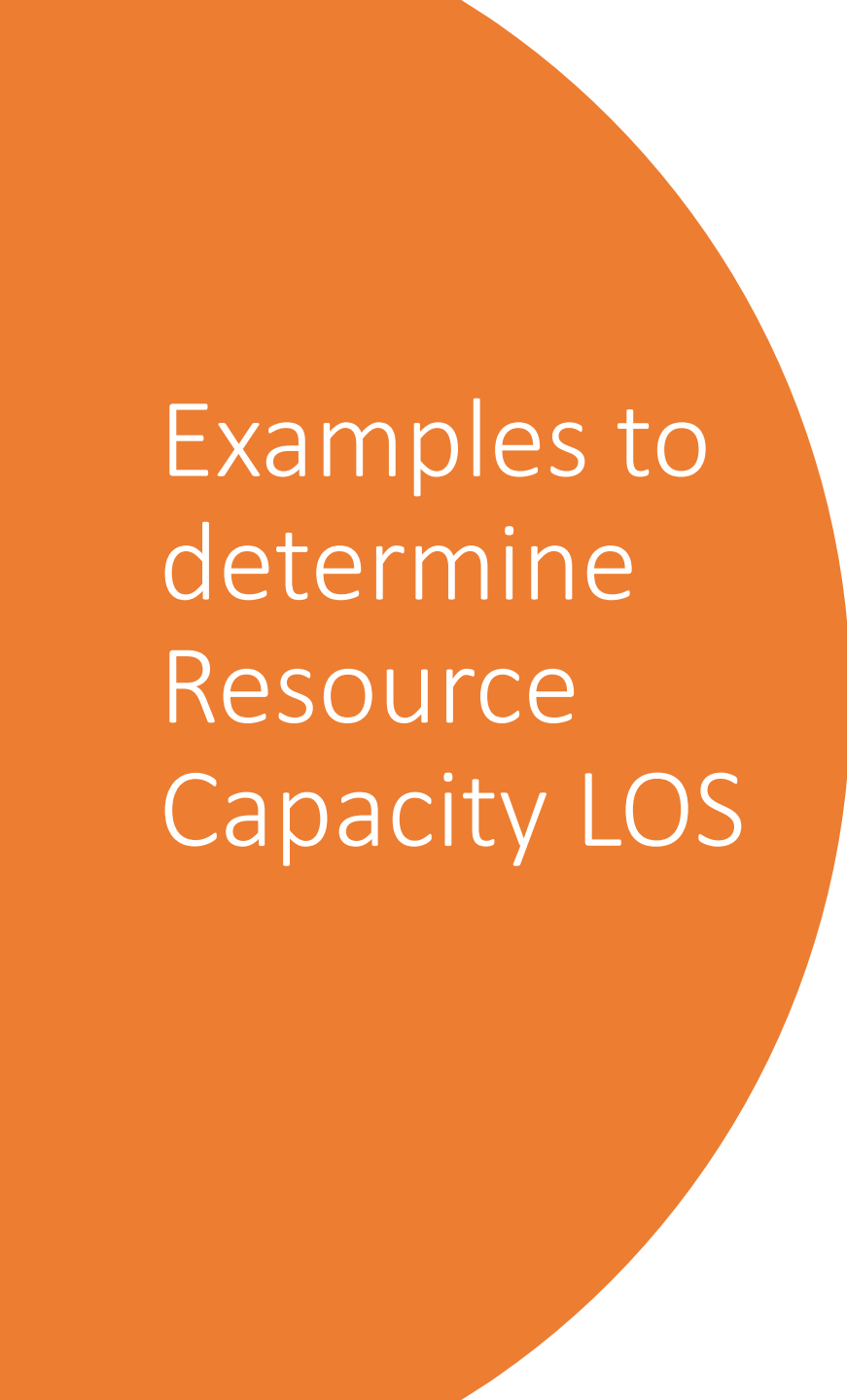
What is your Resource Capacity LOS?

- 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
- Resourcing Strategy & Resource Management – Annual science-based Strategy & Planning for the next fiscal budget.
- 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
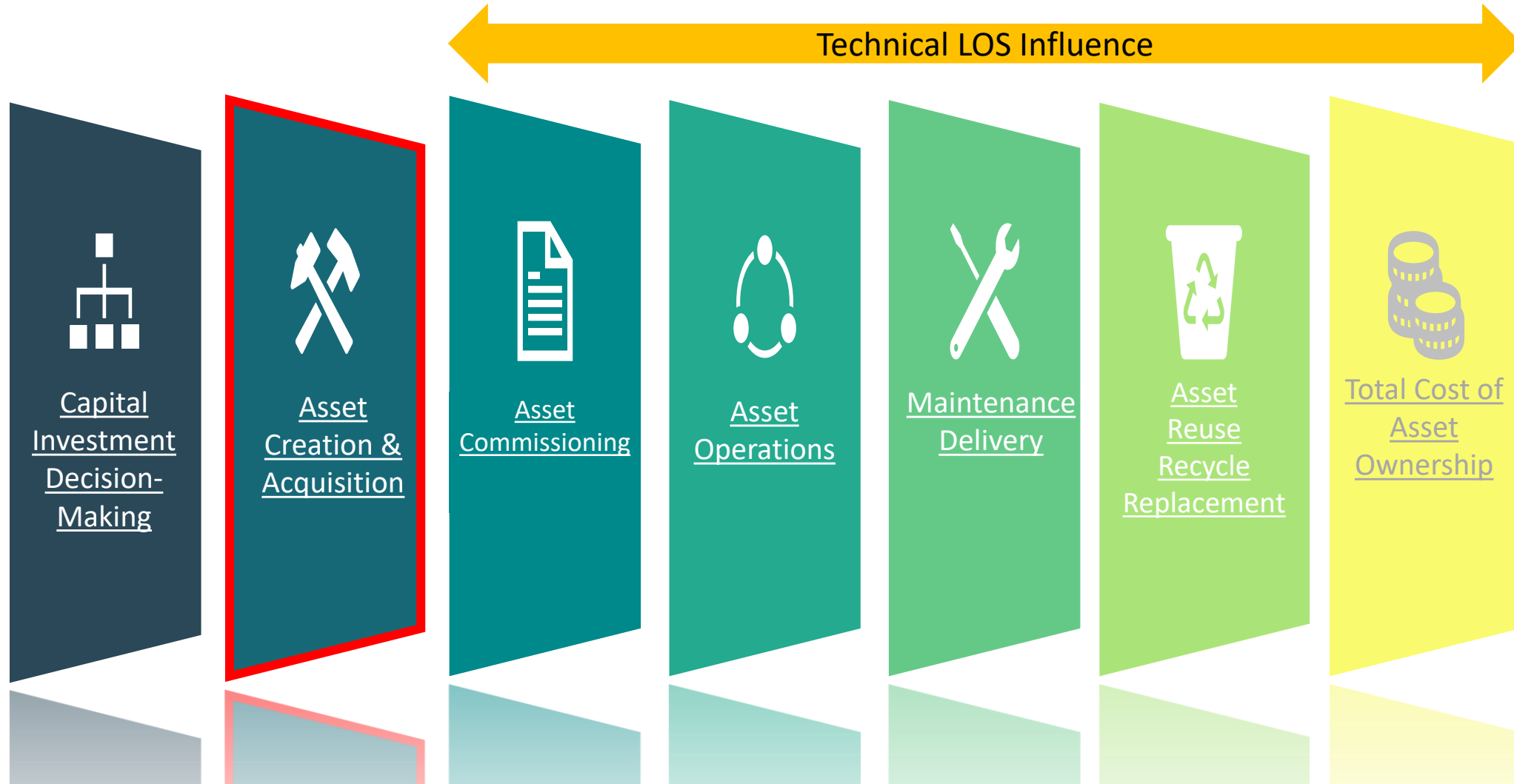
Examples to determine Resource Capacity LOS

- 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

Technical LOS Influence

Capital Investment Decision-Making

Asset Creation & Acquisition

Asset Commissioning

Asset Operations

Maintenance Delivery

Asset Reuse Recycle Replacement

Total Cost of Asset Ownership

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?

Email:
madeclercq66@gmail.com

info@appliedasset.com