

Transportation Asset Management and Managing Bridge Networks

Nat Coley, FHWA



FHWA

Transportation Asset Management Plans and Managing Bridge Networks

Overview

- TAMP Requirements/Dates
- Management The Network
- Life-cycle planning
- Risk management
- Financial plans
- Goal: better understanding of how to leverage your Asset Management Plan

Asset Management Plan Focus

Infrastructure Condition

- Goal: Maintain highway infrastructure assets in a state of good repair
 - Manage networks for the long term at the minimum practicable cost to:
 - Improve or preserve asset condition and system performance
 - Manage risk
 - Short-term performance targets are key indicators

Risk-based Asset Management Plan

Plan Contents

- Pavement and bridge inventory and conditions on the NHS
- Objectives, measures, and targets
- Performance gap identification
- Lifecycle planning
- Risk management analysis.
- Financial plan
- Investment strategies

Asset Management Plans Due Dates

- ***April 30, 2018*** – The due date for States to submit their Initial Asset Management Plan to FHWA for certification review for the TAMP processes.
- ***November 20, 2018*** – The end of the transition period provided for in MAP-21 Section 1106(b), States are to have developed and implemented Asset Management Plans and set targets to use NHPP funds. States may request an extension of this transition period.
- ***June 30, 2019*** – The due date for States to submit their fully compliant Asset Management Plan to FHWA.
- ***August 30, 2019*** – The due date for FHWA to determine whether the State has developed and implemented an AMP.

Network Management

- The appropriate investment calibration for bridge conditions requires a systematic condition inventory, with current and forecast deficiencies
- The goal of a bridge program is to achieve the best network conditions at the lowest life-cycle cost.
- At the program level, bridge management systems can aid in analyzing scenarios to achieve the lowest life-cycle cost for the entire inventory.

Network Management

- At a network level, bridge performance is largely determined by a systematic evaluation of network investments and network conditions.
- The key consideration is to calibrate funding to achieve the lowest life-cycle cost for the entire network.

Network Management

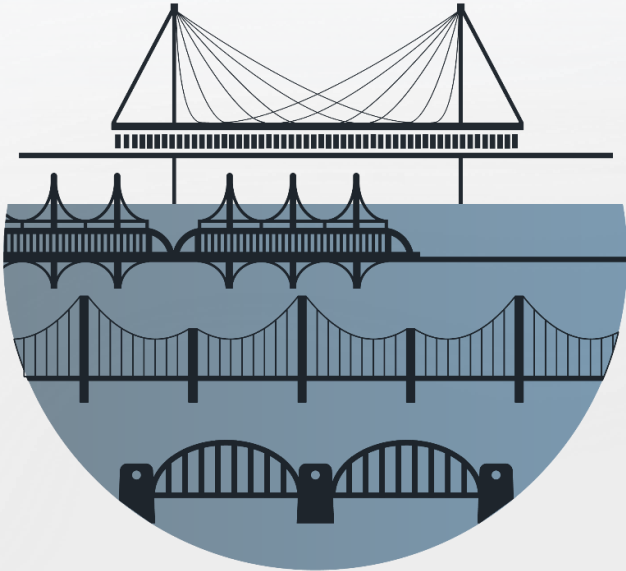
Therefore, the primary consideration of bridge projects is to ensure that the network functions at the lowest life-cycle cost. This implies a level of analysis as part of a bridge management system, with the ability to make program-level tradeoff analysis (investment levels versus outcomes) and program-level outputs for various types of bridge maintenance, repair and replacement activities

TAMP investment strategies should collectively make or support progress toward:

- Achieving and sustaining a desired state of good repair over the life cycle of the assets
- Improving or preserving the condition of the assets and the performance of the network relating to physical assets
- Achieving the State DOT targets for asset condition and performance of the NHS in accordance with 23 USC 150(d)
- Achieving the state performance goals and targets

What Is a Life-Cycle Plan(LCP)?

NETWORK LEVEL



- LCP considers the:
 - Availability of different treatment options
 - Cost
 - Funding and other constraints
 - Analysis period
 - Time value of money

LCP vs. LCCA

NETWORK LEVEL

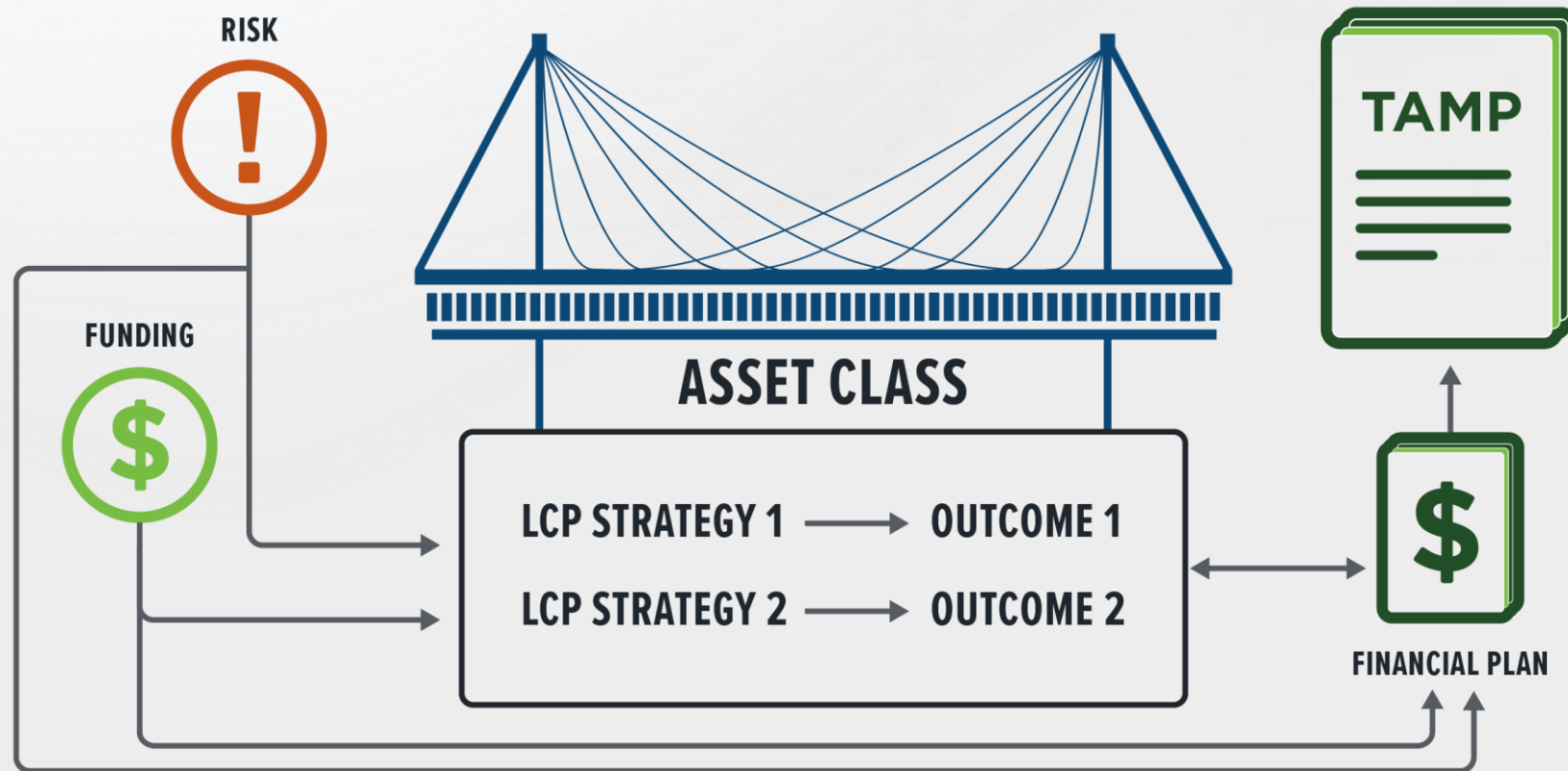


PROJECT LEVEL

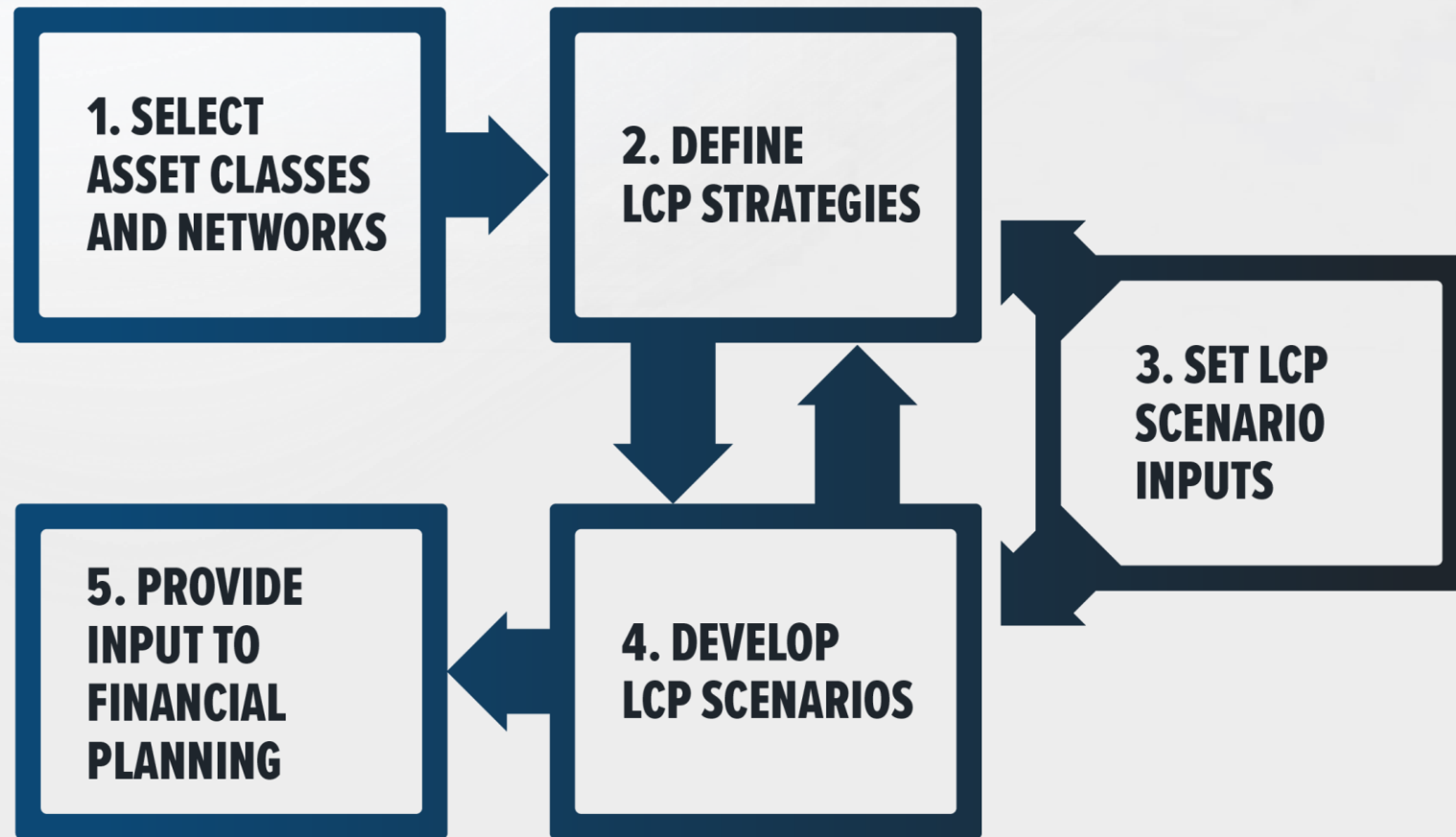


How Does LCP Support a TAMP?

LIFE CYCLE PLANNING PER ASSET CLASS



LCP Process



Using LCP Process Results

- What LCP scenario leads to the lowest practical life-cycle cost?
- Does the scenario address risks and constraints?
- What conditions can be achieved at different funding levels for each LCP scenario?
- What LCP scenarios should be advanced to the financial planning process?

Risk Management: Key Concepts

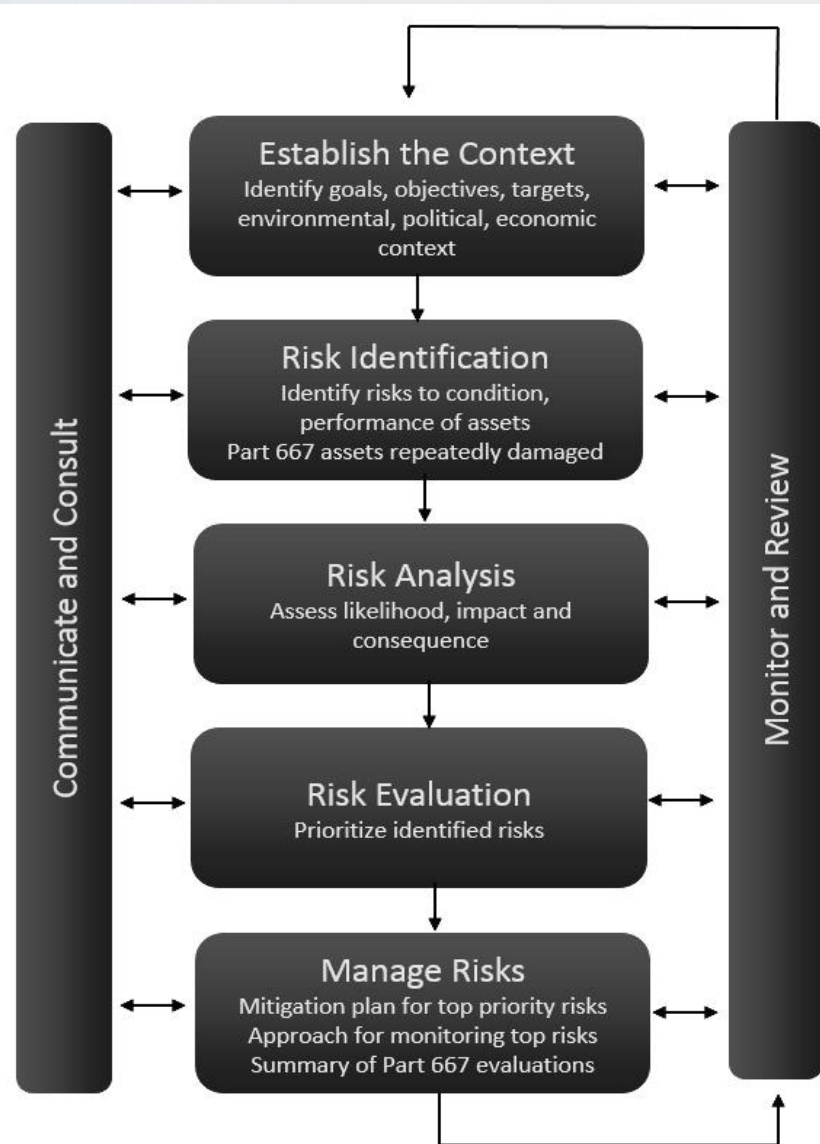
- Addresses uncertainty, variability, opportunities, and threats (Much of this is in Design Process, Don't double Count risks)
- Identifies, analyzes, prioritizes, and manages threats and opportunities to asset management performance objectives and condition targets
- Summarizes changes in environmental conditions and their impact

Role of Risk Management

- How does risk management support performance and asset management?
 - Provides a framework for **analyzing, prioritizing, and addressing** uncertainties specific to achieving TAMP performance objectives and condition targets, including the financial and LCP strategies



Risk Management Process



Analyze Risks

What is the likelihood and consequence associated with each risk?

Risk Matrix with Impact and Likelihood Definitions			Likelihood				
			Rare	Unlikely	Likely	Very Likely	Almost Certain
			Less than once every 10 years	Once in more than 3 but less than 10 years	Once between 1-3 years	Once a year	Several times a year
Impact	Catastrophic	Potential for multiple deaths & injuries, substantial public & private cost.	Medium	Medium	High	Very High	Catastrophic
	Major	Potential for multiple injuries, substantial public or private cost and/or foils agency objectives.	Low	Medium	Medium	High	Very High
	Moderate	Potential for injury, property damage, increased agency cost and/or impedes agency objectives.	Low	Medium	Medium	Medium	High
	Minor	Potential for moderate agency cost and impact to agency objectives.	Low	Low	Low	Medium	Medium
	Insignificant	Potential impact low and manageable with normal agency practices.	Low	Low	Low	Low	Medium



Purpose of a Financial Plan

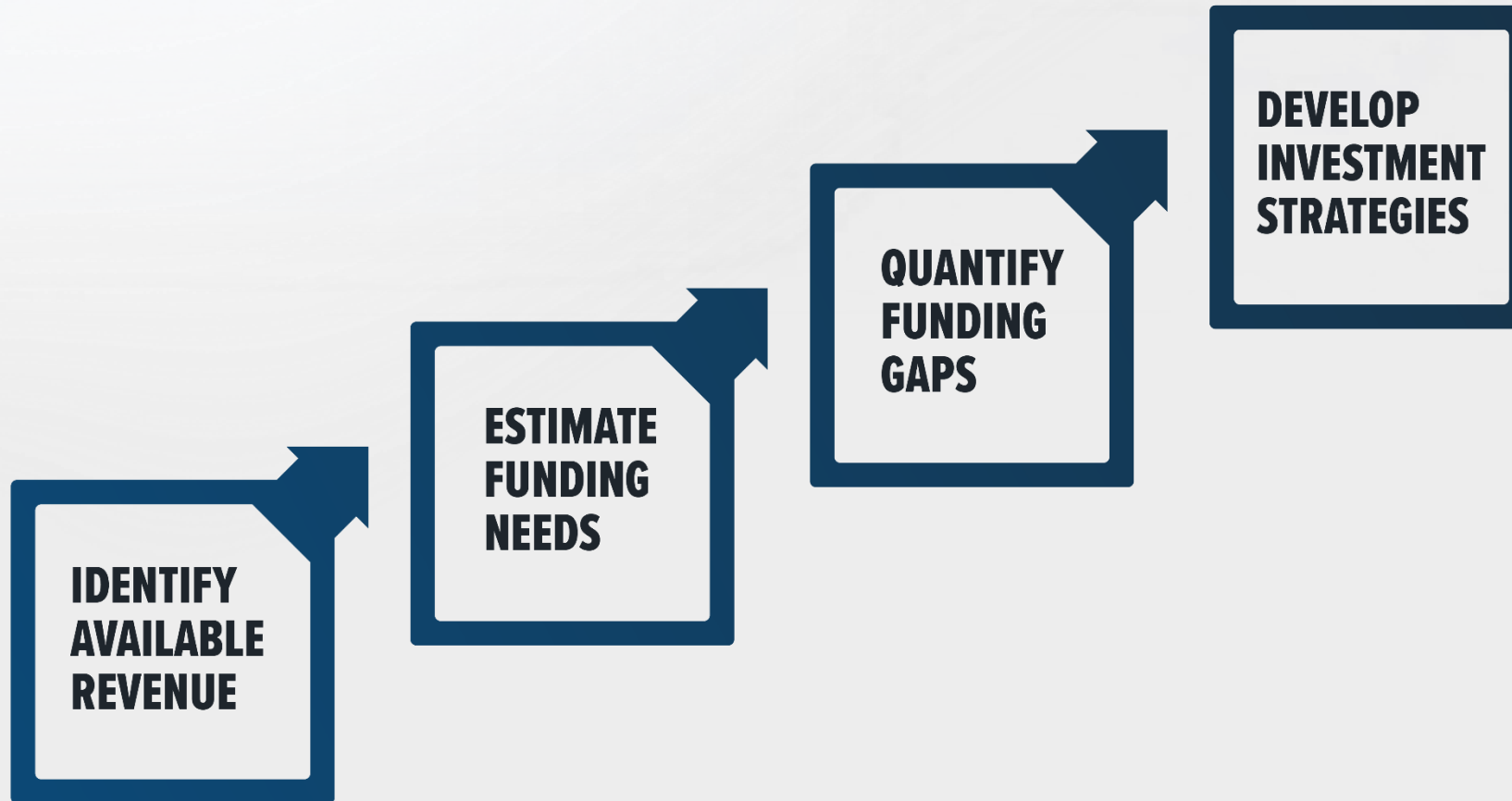
- Communicates the financial environment
- Provides 10-year revenue forecast
- Identifies funding needed to achieve desired state of good repair
- Demonstrates level of conditions achievable with anticipated funding level
- Basis for comparison of investment strategies

Information Used to Develop a Plan

- Financial information
- LCP
- Condition predictions
- Initial targets
- Risk analysis results
- Recommendations from other plans
- Performance gap analysis



Developing a Financial Plan



FHWA Resources

- FHWA Office of Asset Management
<http://www.fhwa.dot.gov/asset/index.cfm>
- NHI Transportation Asset Management Training Courses
- Certification and Consistency Review Guidance out for comment in the Federal Register, June 5, 2017
- Asset Management Q&As
- Interim Guidance for Life-cycle Planning, Risk Management, and Financial Plans

Thank You