

# Fundamentals of Asset Management

*Step 5. Set Target Level of Service*

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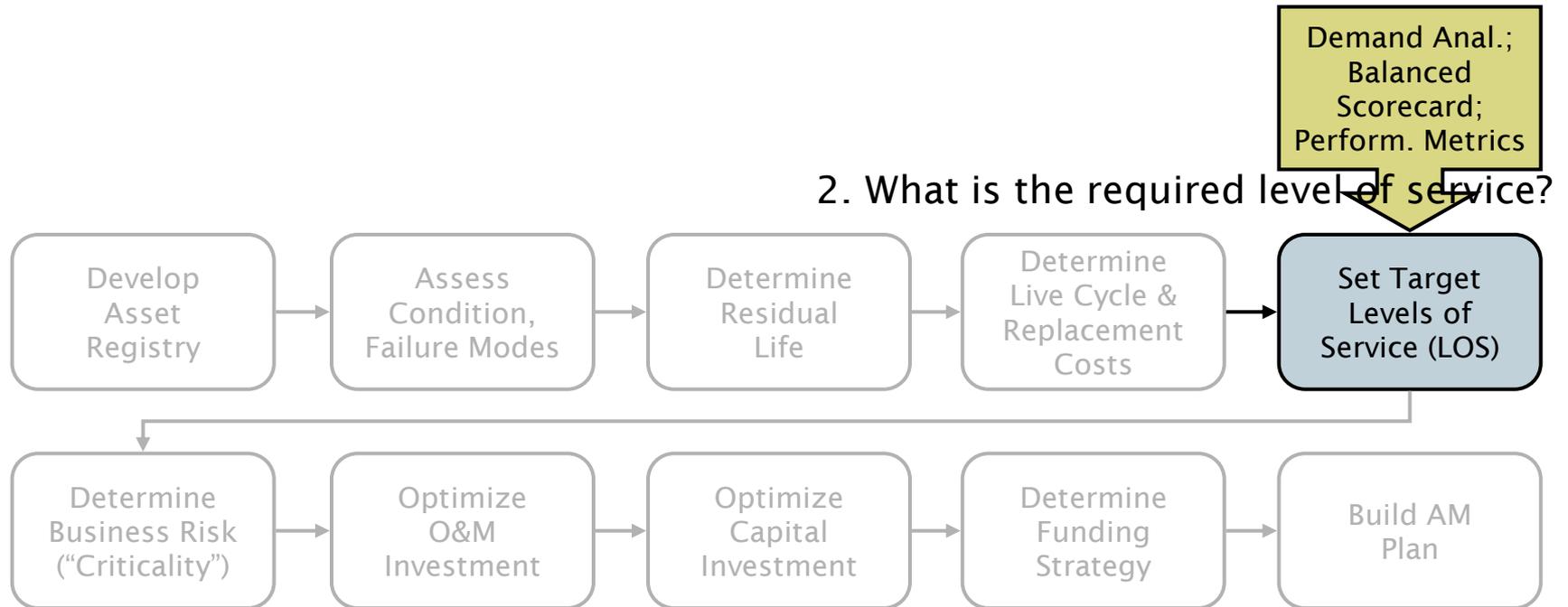
*A Hands-On Approach*

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## Second of 5 core questions

2. What is the required level of service (LOS)?
  - What is the *demand for my services* by my stakeholders?
  - What do *regulators require*?
  - What is my *actual performance*?

# AM plan 10-step process



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# Level of service

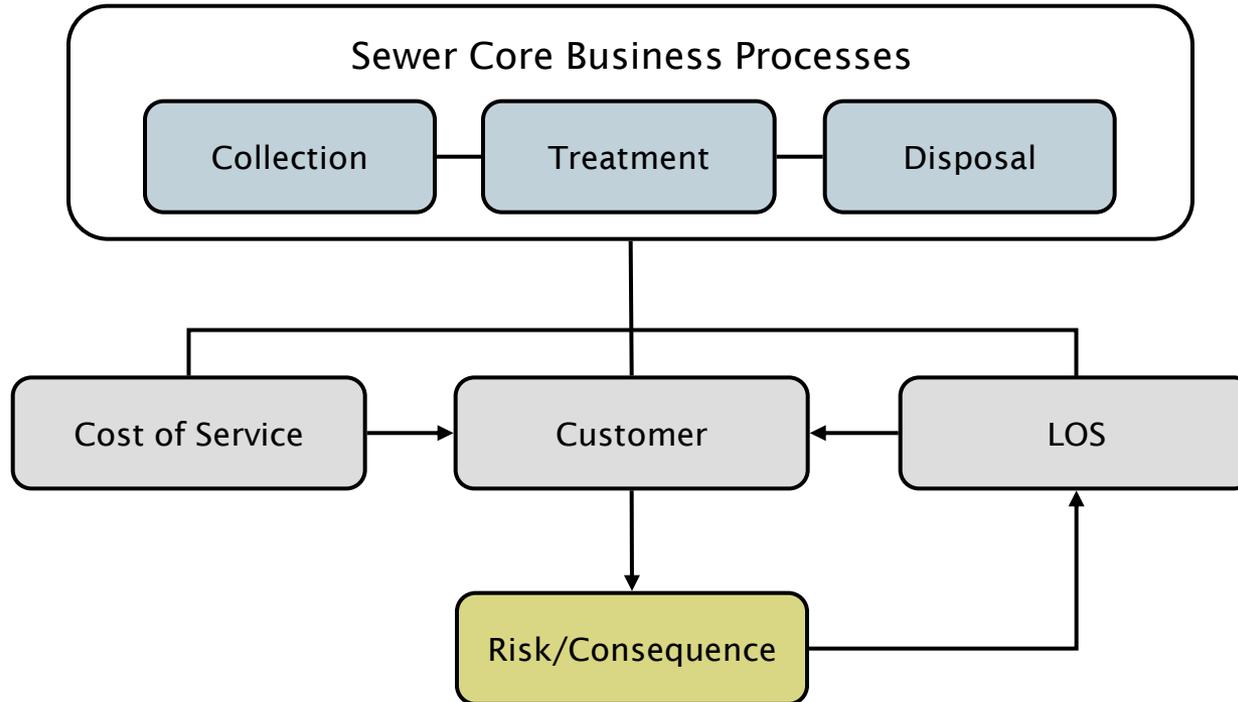
- Good, output-oriented management is driven by a defined standard or level of service
- Where that LOS is
  - Driven by *customer-user* demand
  - As determined by the appropriate legislative body in a political arena
  - Tied at the *strategic* organizational level to the *tactical* asset level
- LOS can be defined as
  - Characteristics or attributes of a service that describe its required level of performance
  - These characteristics typically describe *how much, of what nature, and how frequently* about the service

# Why LOS?

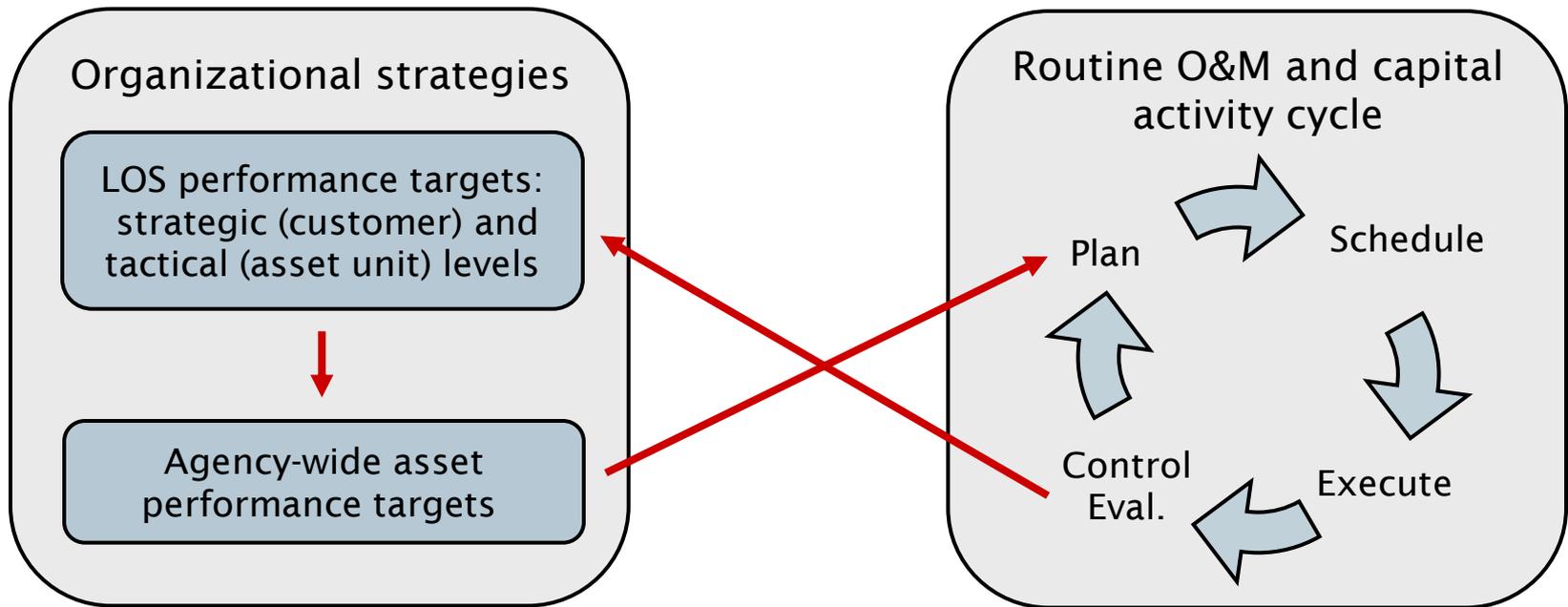
It helps us...

- *Concentrate* (focus) efforts and resources
  - On agreed on service levels
  - Less *service-level-defined by notion*
- *Communicate* service expectations and choices
  - Increased services equal increased costs
  - Discussion of trade-offs and risks
- *Negotiate* (regulators and council/commission/board)
  - Service levels
  - Costs and budgets
  - Rate impacts
  - Reinvestments for renewal
  - Level of risk

# LOS's strategic position



# Alignment of routine O&M and capital activities with organizational strategies



# Nature of LOS

- LOS occurs at multiple levels
  - Agency-wide
  - Groups or systems of assets (collection system, treatment plants)
  - Assets (individual pump stations, digesters, clarifiers)
  - Key asset components (pumps, motors, vfd's)
- LOS targets are established to *roll up* to meet higher level targets

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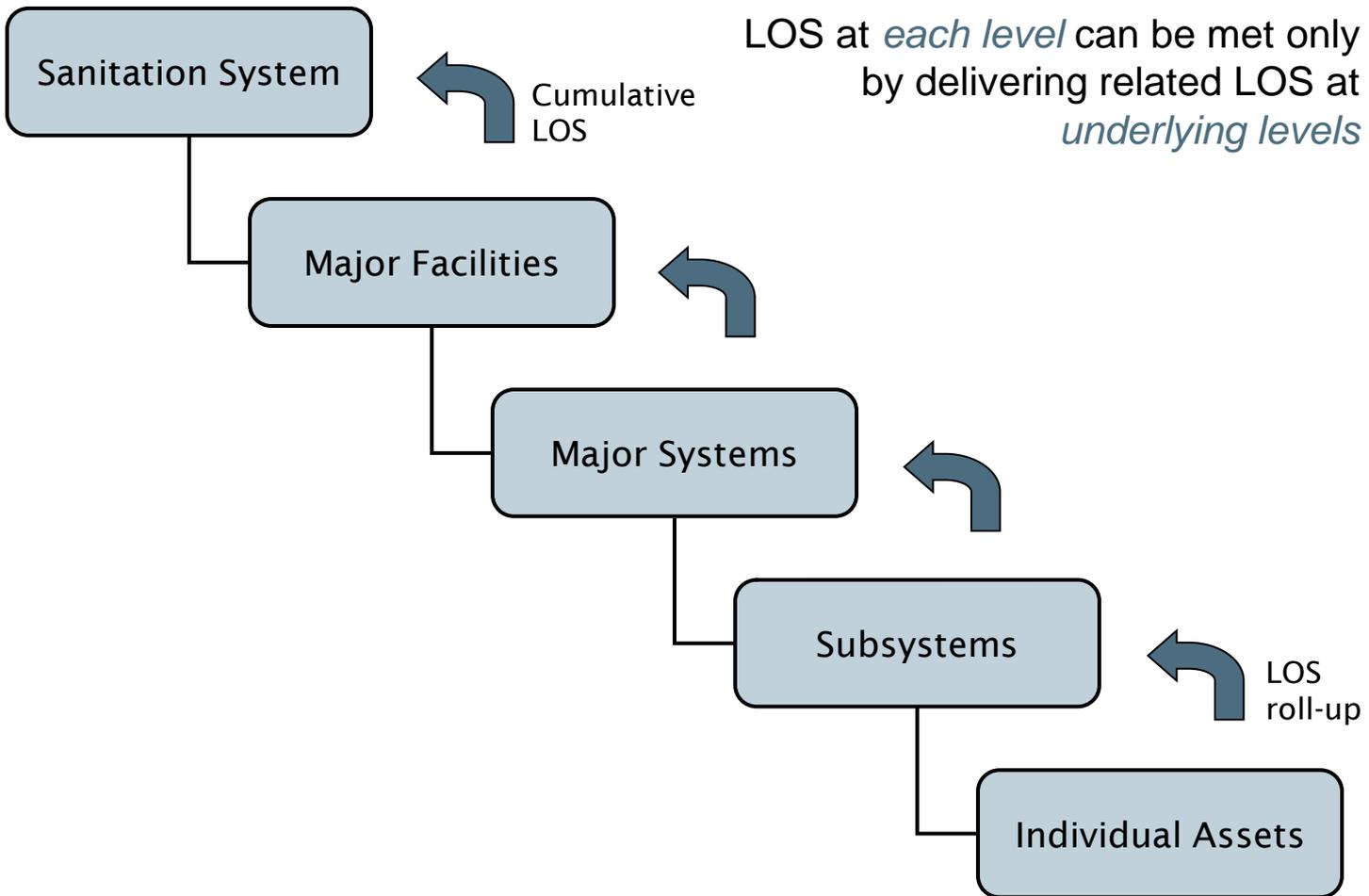
## Nature of LOS, continued

There are internal and external LOS targets

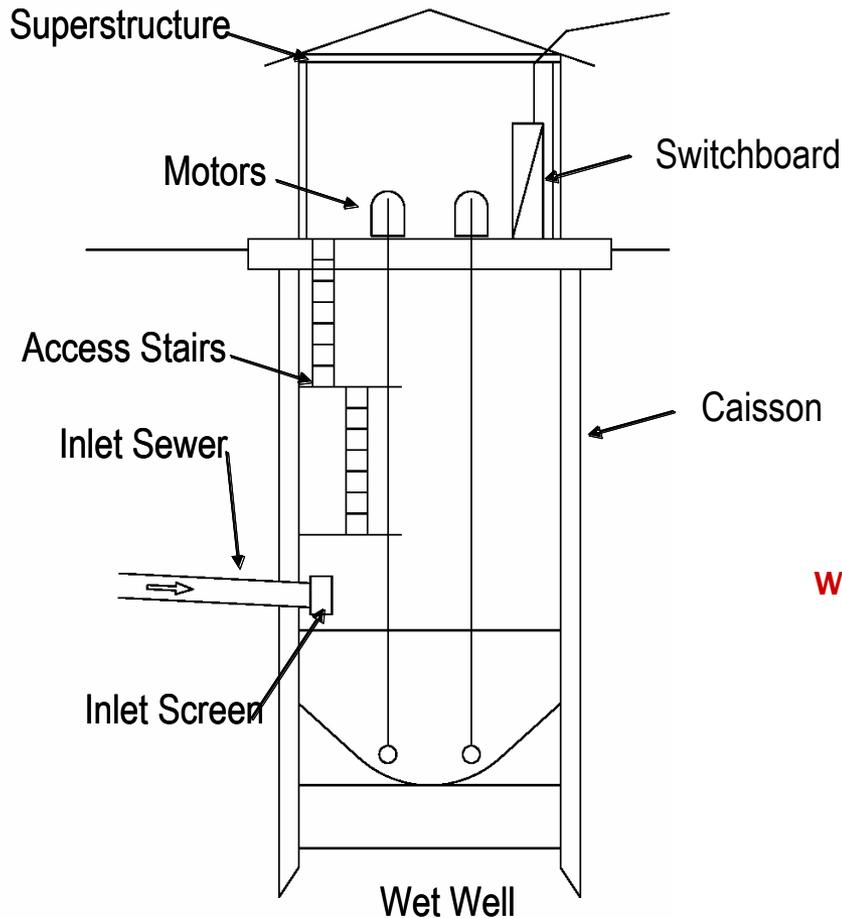
- External LOS targets typically are strategic or KPI outcomes
  - Driven by customer-user demand
  - Confirmed or determined by the appropriate legislative body in a political arena
- Internal LOS targets typically are tactical and geared toward focusing activities

LOS is level of service, KPI is key performance indicator

# Roll up of LOS



# Pump station LOS requirements



*Which assets relate directly to achieving target levels of service?*

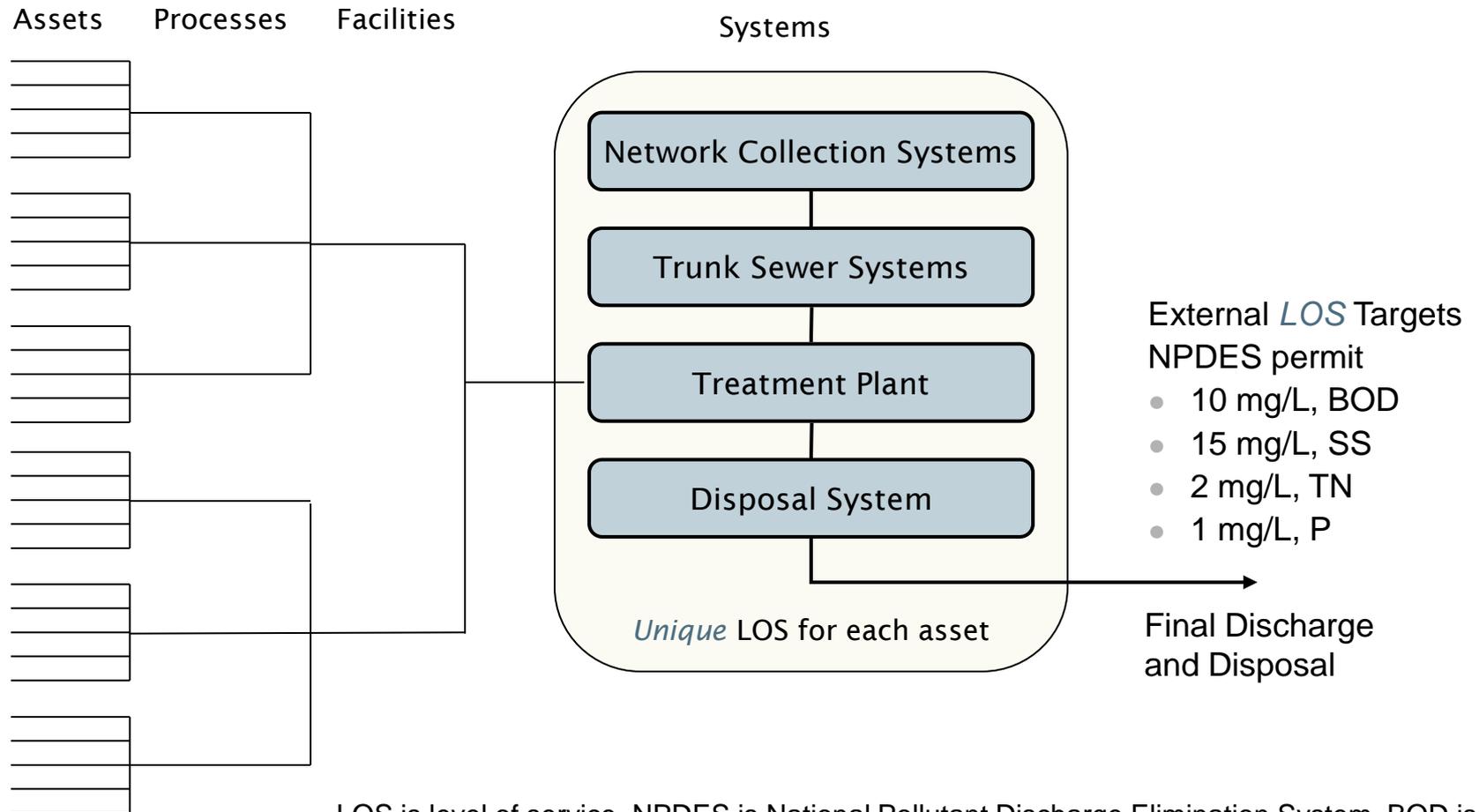
External *LOS for Pump Station*

- No preventable SSOs
- 3 odor complaints/year. max.
- 35 dB at boundary, max.
- OSHA compliance
- NPDES & CMOM compliance

**Where in the lift station is noise generated?**

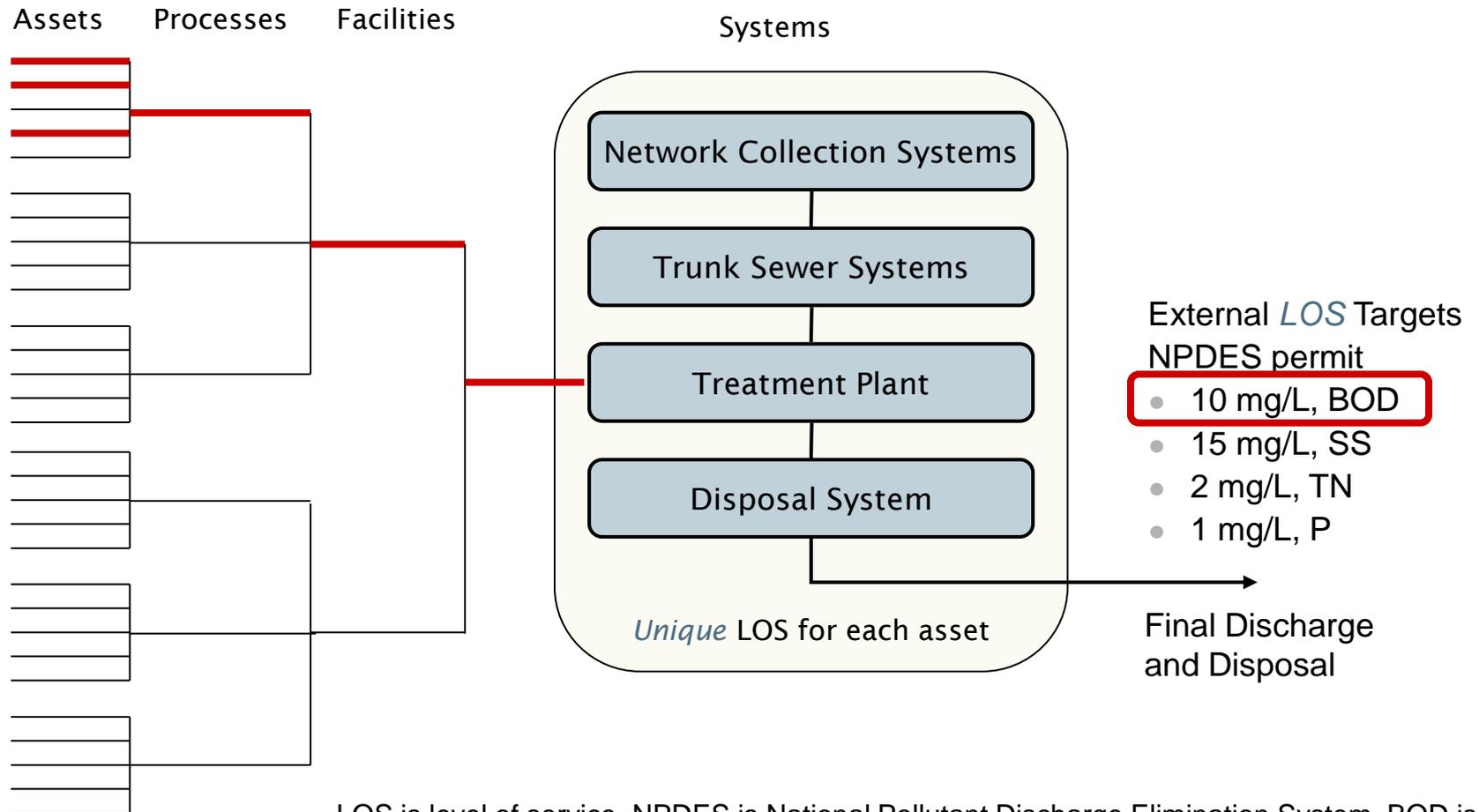
LOS is level of service, SSOs are storm sewer overflows, dB is decibel, OSHA is Occupational Safety and Health Administration, NPDES is National Pollutant Discharge Elimination System, CMOM is capacity, management, operation, and maintenance

# System performance requirements



LOS is level of service, NPDES is National Pollutant Discharge Elimination System, BOD is biochemical oxygen demand, SS is suspended solids, TN is total nitrogen, P is phosphorus

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# Four major *failure modes*

<i>Failure Mode</i>	<i>Definition</i>	<i>Tactical Aspects</i>	<i>Management Strategy</i>
<b>Capacity</b>	Volume of demand exceeds design capacity	Growth, system expansion	Redesign
<b>LOS</b>	Functional requirements exceed design capacity	Codes & permits: NPDES, CSOs, OSHA, noise, odor, life safety; service, etc.	O&M optimization, renewal
<b>Mortality</b>	Consumption of asset reduces performance below acceptable level	Physical deterioration due to age, usage (including operator error), acts of nature	O&M optimization, renewal
<b>Efficiency</b>	Operations costs exceed that of feasible alternatives	Pay-back period	Replace

NPDES is National Pollutant Discharge Elimination System, CSOs are combined sewer overflows, and OSHA is Occupational Safety and Health Administration

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# Forces driving LOS

LOS is constantly subjected to forces of change:

- Growth/retrenchment
- Regulatory requirements
- Demands of customers
- Physical deterioration
- Operational costs/efficiencies

# Example: Pump station LOS

<i>Standard</i>	<i>Measure</i>	<i>Current</i>	<i>Target</i>
<i>Performance</i>			
Odor	Complaints/year	0.5	1
	Number/year	2	0
Spills	Gallons/spill	56,000	2,000
Pumping	Percent influent	99.68%	100%
<i>Reliability</i>			
SCADA	Outages/year	7	2
	Duration, hours	72+	8
Power	Outages/year	1	1
	Duration, hours	7	2.5

# Example: Pump station LOS

<i>Standard</i>	<i>Measure</i>	<i>Current</i>	<i>Target</i>
<i>Reliability, cont.</i>			
Pumps	% reserve capacity, peak Q	30%	30%
	% redundancy at peak Q	0	50%
Power	2nd source, hours	7	2.5
<i>Regulatory</i>			
Spill reporting	Verbal, hours	NA	24
	Report, days	21	10
	Impact notice, hours	NA	8
	Training, hours/yr	0	8

# Key points from this session

## *What is my required sustainable level of service?*

### Key Points:

- LOS is the “collection of measurable attributes or characteristics of a product or service delivered” to a customer
- LOS is most useful in a long term perspective - “sustainable LOS”
- LOS is ultimately defined by customers and regulators through the agency’s Policy Board.
- System performance and customer satisfaction (“serviceability”) are related but separate concepts.
- LOS is directly related to the cost of service and the level of acceptable business risk.
- LOS is best measured across a range of balanced measures.
- Staff and Board should be involved in determining LOS, but it is not necessary that the Board be involved if they refuse.

### Associated Techniques:

- Customer demand analysis
- Regulatory requirements analysis
- Level of service statements; LOS “roll-up” hierarchy
- Balanced scorecard”
- Asset functionality statements
- AM Charter