



Economic Framework: Performance Standards for Water Loss

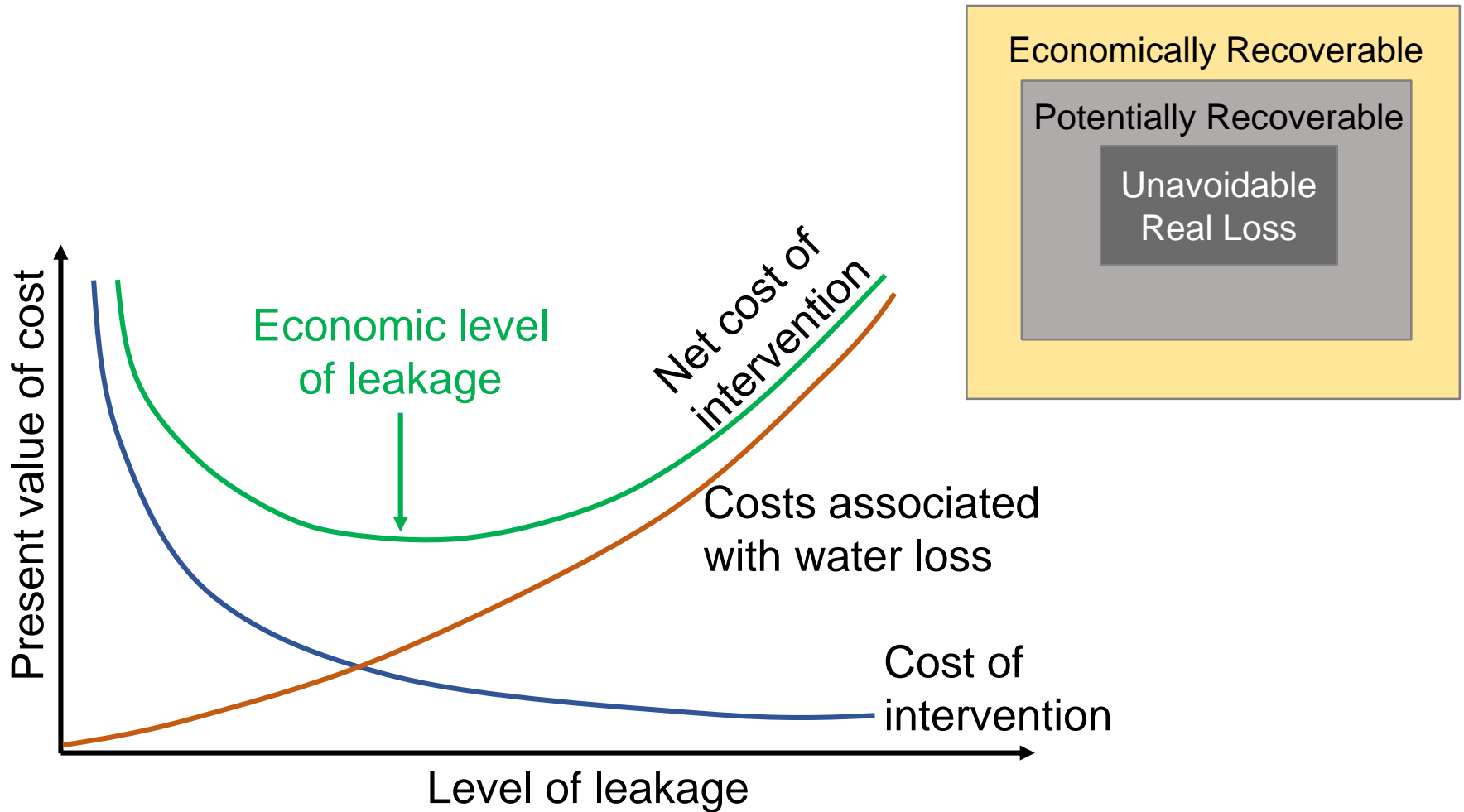
Kartiki Naik

State Water Resources Control Board

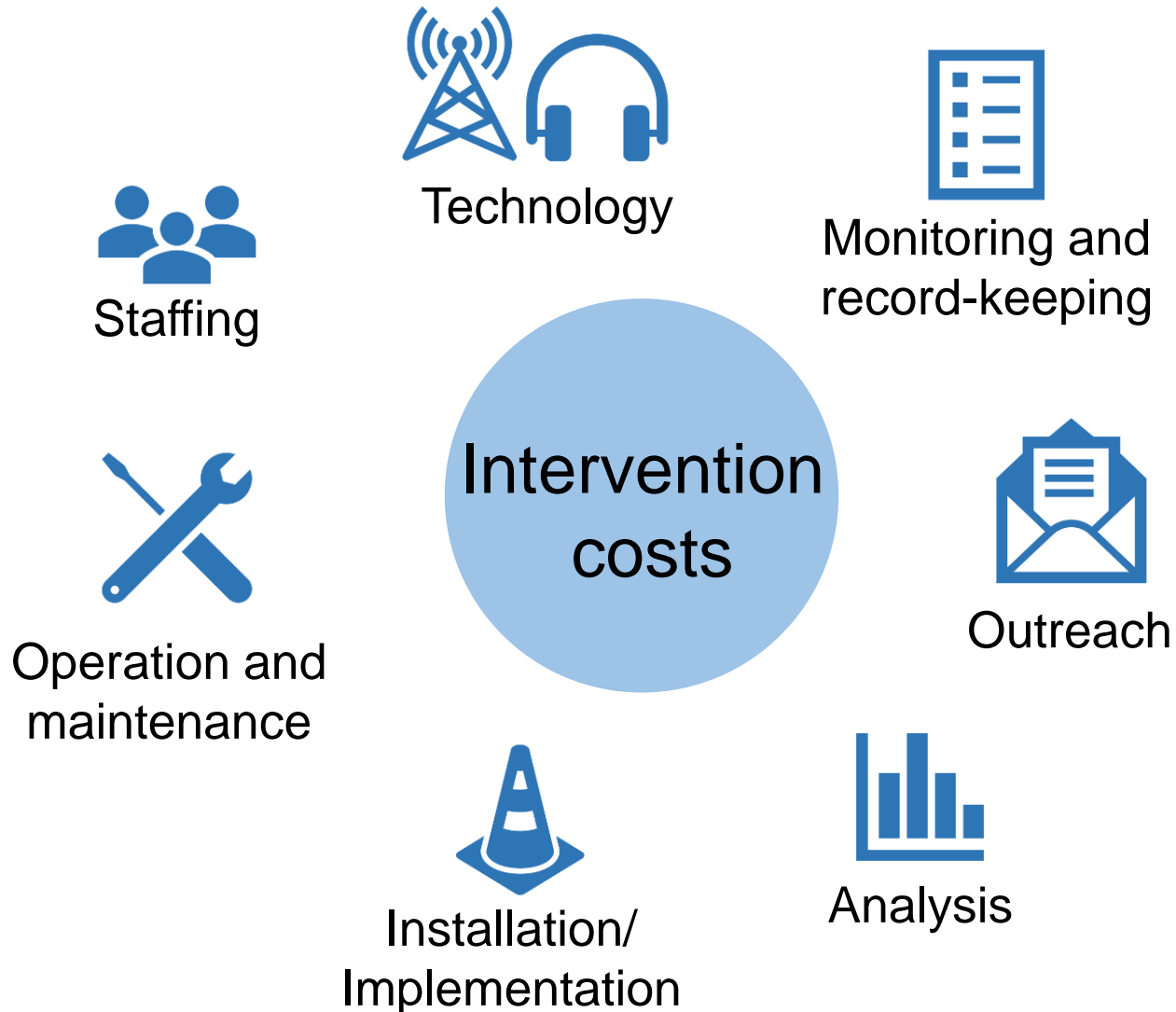


February, 2019

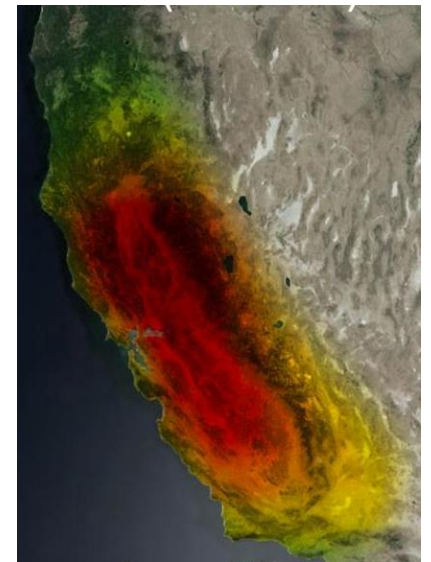
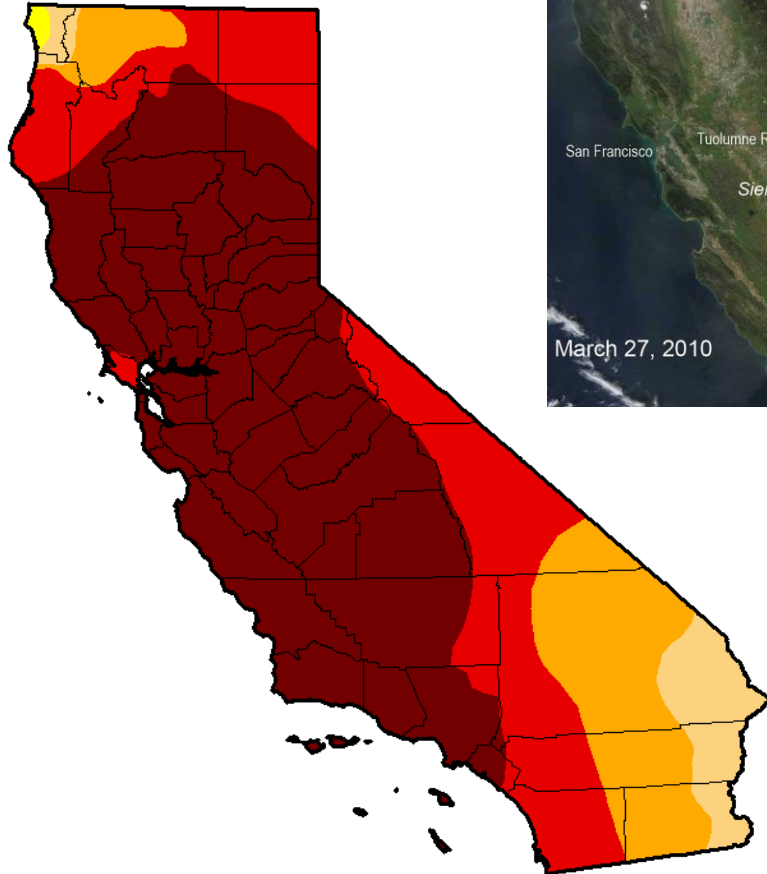
Economic Level of Leakage



Cost of Compliance



Need for a Long-term Approach



Benefits from Compliance

Avoided cost of water



Benefits from Compliance



Avoided damages



Avoided cost of outages

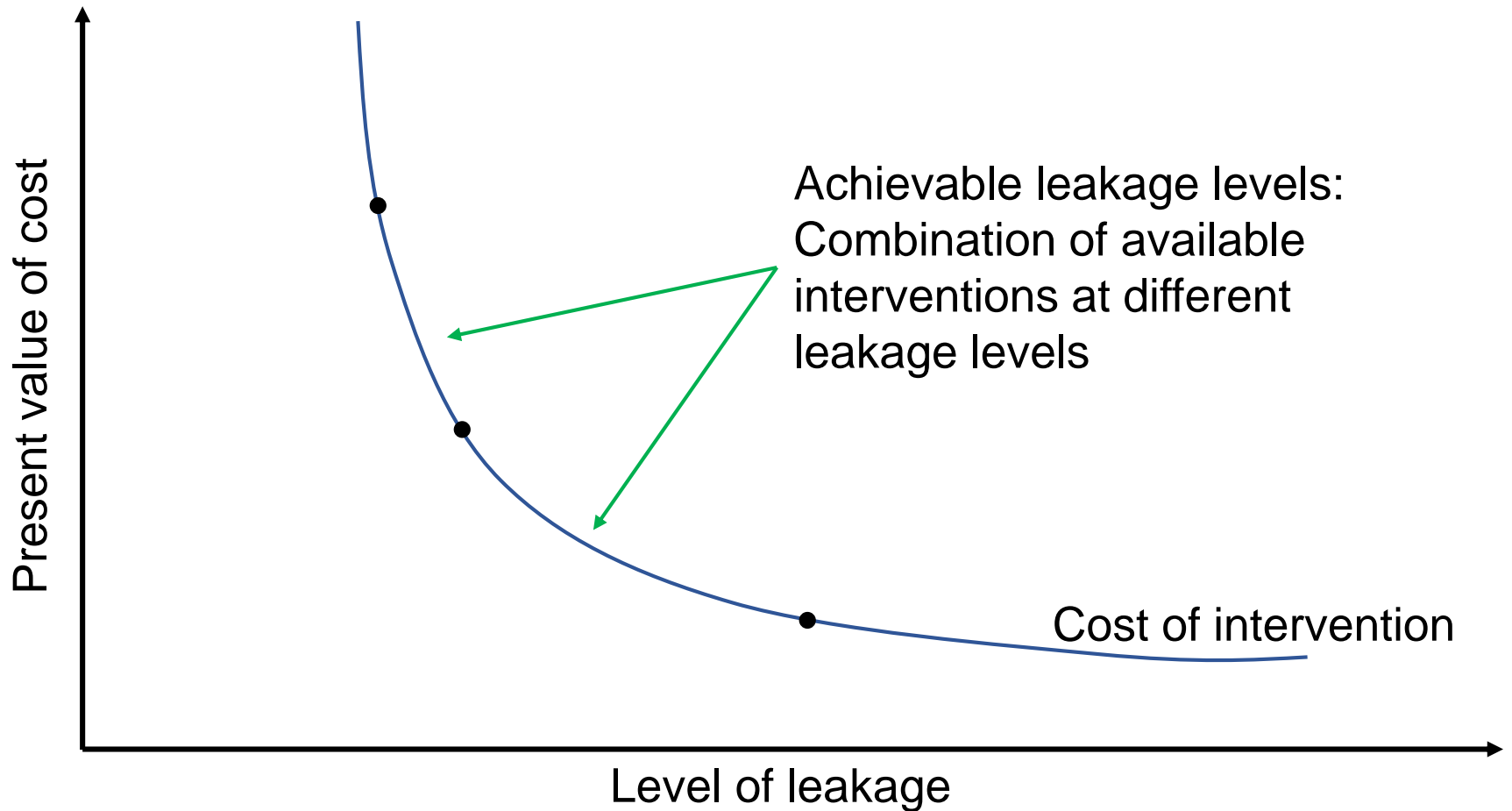


Impacts on traffic

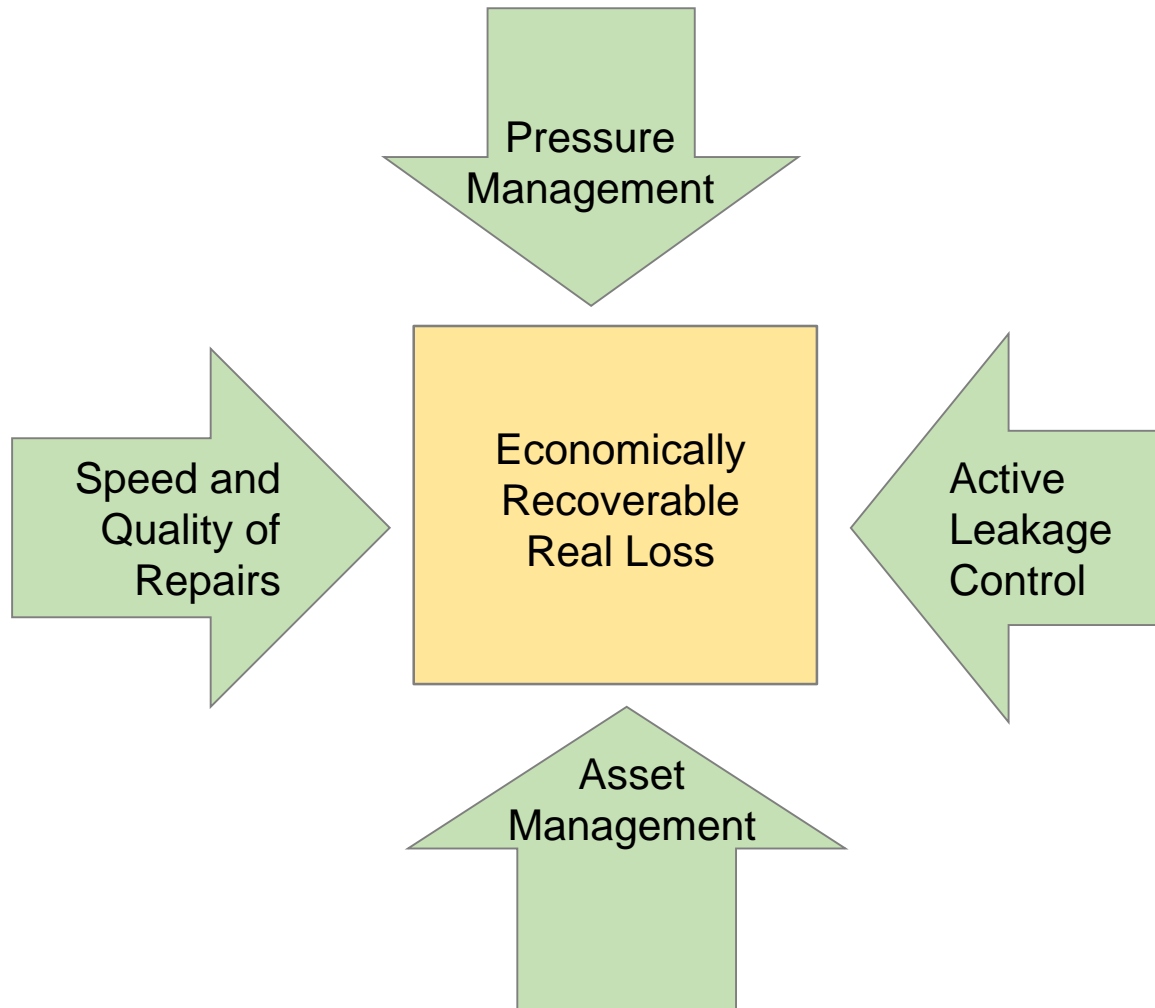


Customer satisfaction

Intervention Toolbox

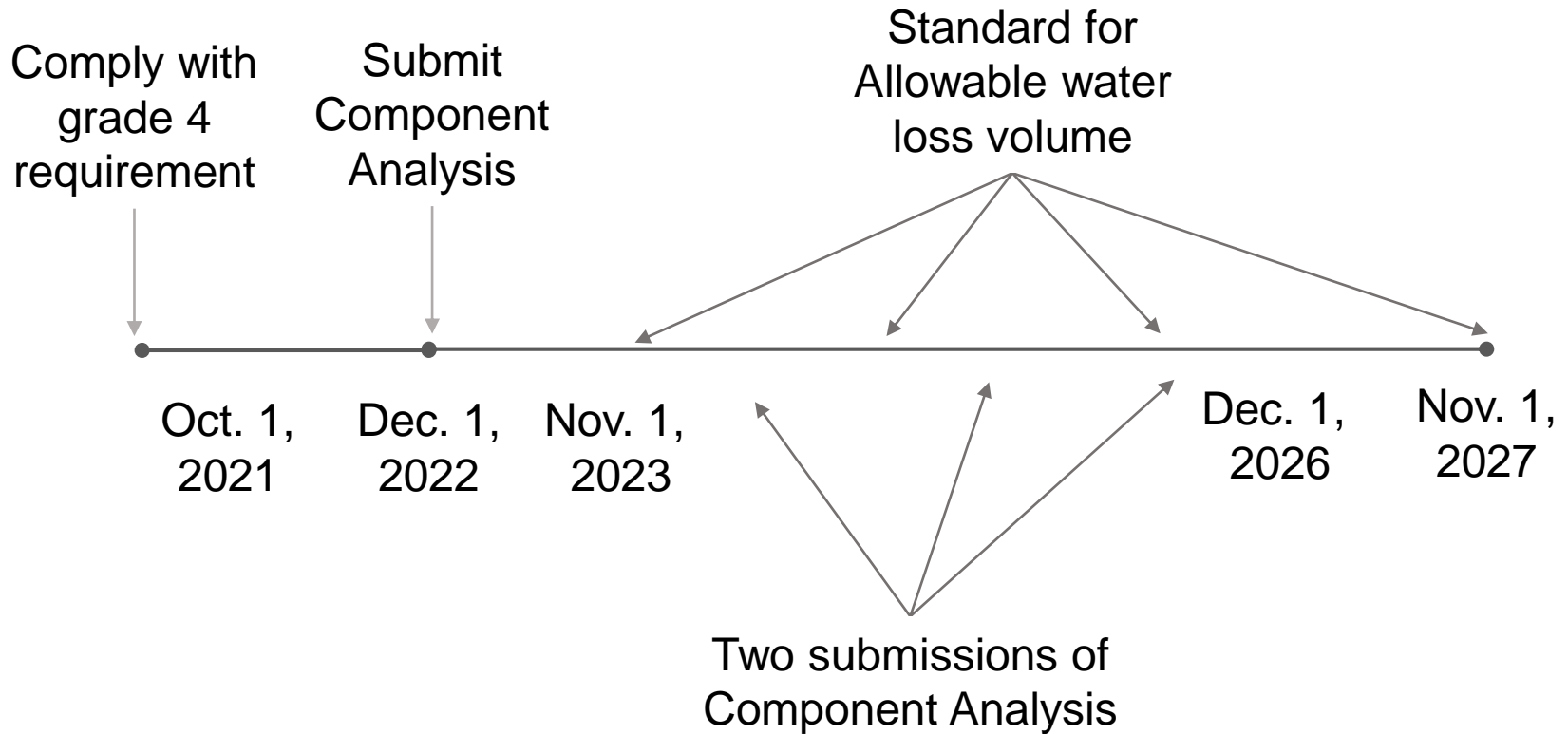


Intervention Toolbox



Monitoring and Initial Implementation

Phases 1 and 2



Initial Performance Standards

Water Loss Audits

Electronic Annual Reports

Case studies

Literature



- Water loss estimates
- System characteristics
- Intervention costs at different leakage levels

- Reduction through different interventions
- Cost of water
- Avoided costs:
Outages, Damages, Energy, Capacity



Costs for Monitoring and Analysis

- Component Analyses
- Pressure Monitoring

+

Cost of Interventions for reducing losses at a given level of leakage

v/s

Avoided cost of lost water

Adjustments for Phases 1 and 2

Phase 1

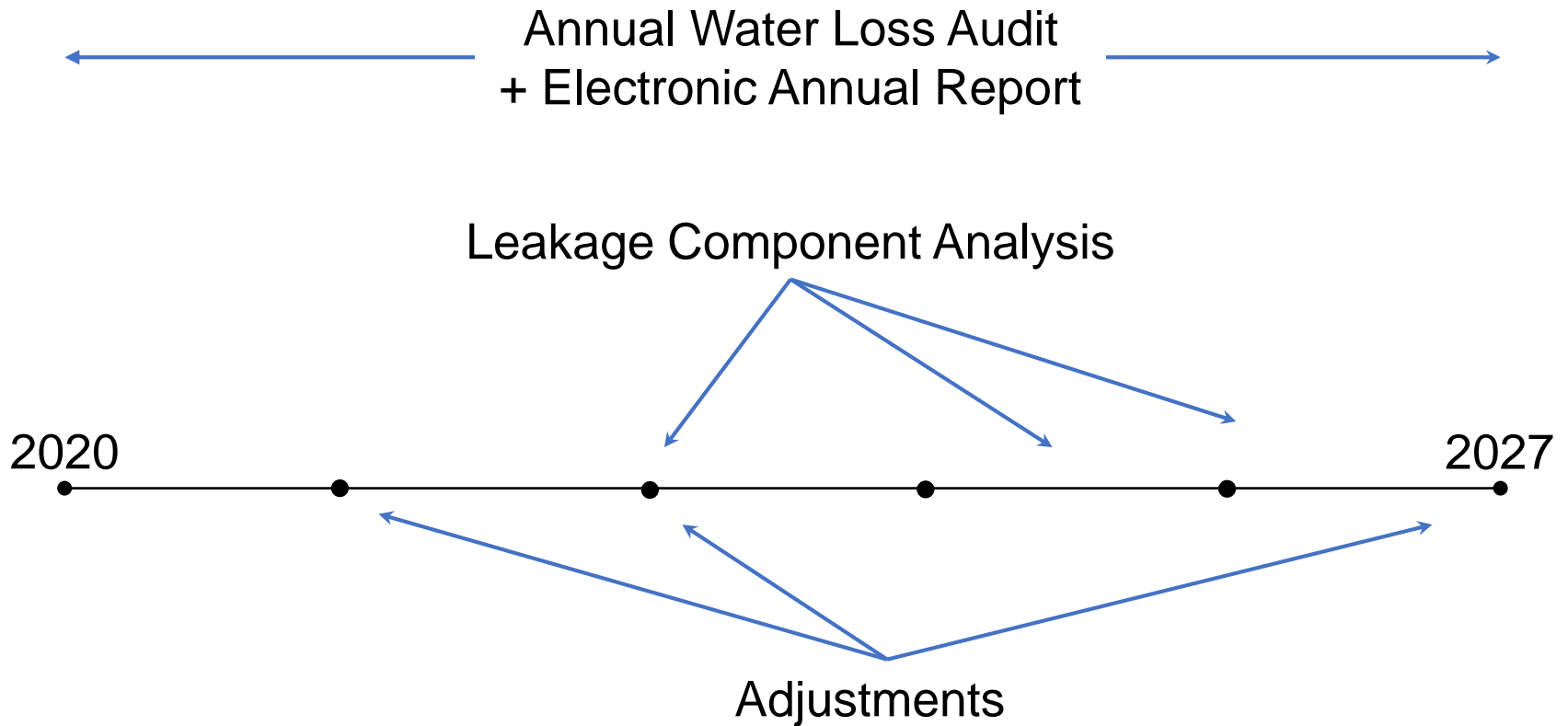
- Compliance date for:
 - Grade 4 for Average Operational Pressure (AWWA audit)
 - Submission of Component Analysis
- Allowable water loss volume for Phase 2
 - Adjustment requests based on audit data

Phase 2

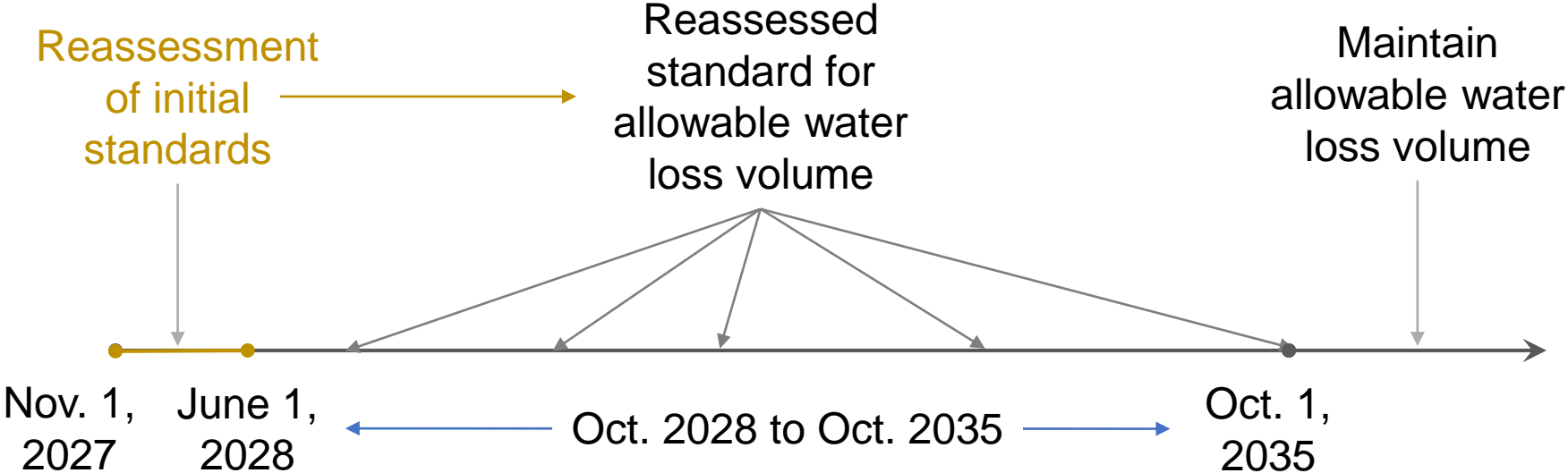
Allowable water loss volume for Phases 3 and 4

- Submission of adjustment requests based on initial implementation

Additional Data from Phases 1 and 2



Systemwide Implementation Phase 3



Reassessed Performance Standards

Water Loss Audits

Initial implementation

Electronic Annual Reports

Adjustments

Component Analysis

Case studies

Literature



- Water loss estimates
- System characteristics
- Intervention costs at different leakage levels
- Leakage profile

- Reduction through different interventions
- Cost of water
- Avoided costs: Outages, Damages, Energy, Capacity
- Implementation constraints



Costs for Monitoring and Analysis

- Component Analyses
- Pressure Monitoring

+

Cost of Interventions for reducing losses at a given level of leakage

v/s

Avoided cost of lost water

Summary of Proposed Framework

- Long term phased approach
 - Adjustments in compliance requirements
 - Findings from initial implementation
- Cost-effective implementation from intervention toolbox
 - Data from water loss audits, Component Analysis, initial Implementation, case studies, literature
 - System characteristics, leakage profile, water loss estimates, intervention efficiencies, water cost profile
- Benefits
 - Revenue
 - Avoided costs of damage, outages, energy and capacity
 - Customer satisfaction

Next steps

- Spring 2019 workshop on economic model:
May - June 2019
- Formal rulemaking process expected to begin:
Early July 2019

https://www.waterboards.ca.gov



Board



Programs



Drinking Water



Water Quality

Hot Topics

Agriculture

Cannabis Cultivation

Conservation

Delta Watermaster

Beaches & Ocean

Drought Year Info

Enforcement

Financial Assistance

Groundwater

Human Right to Water

Operator Certification

Permit / Licensing

Petitions

Septic Systems

Storage Tanks

Storm Water

Strategic Plan

Water Quality A

More Programs

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https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/water_loss_control.html