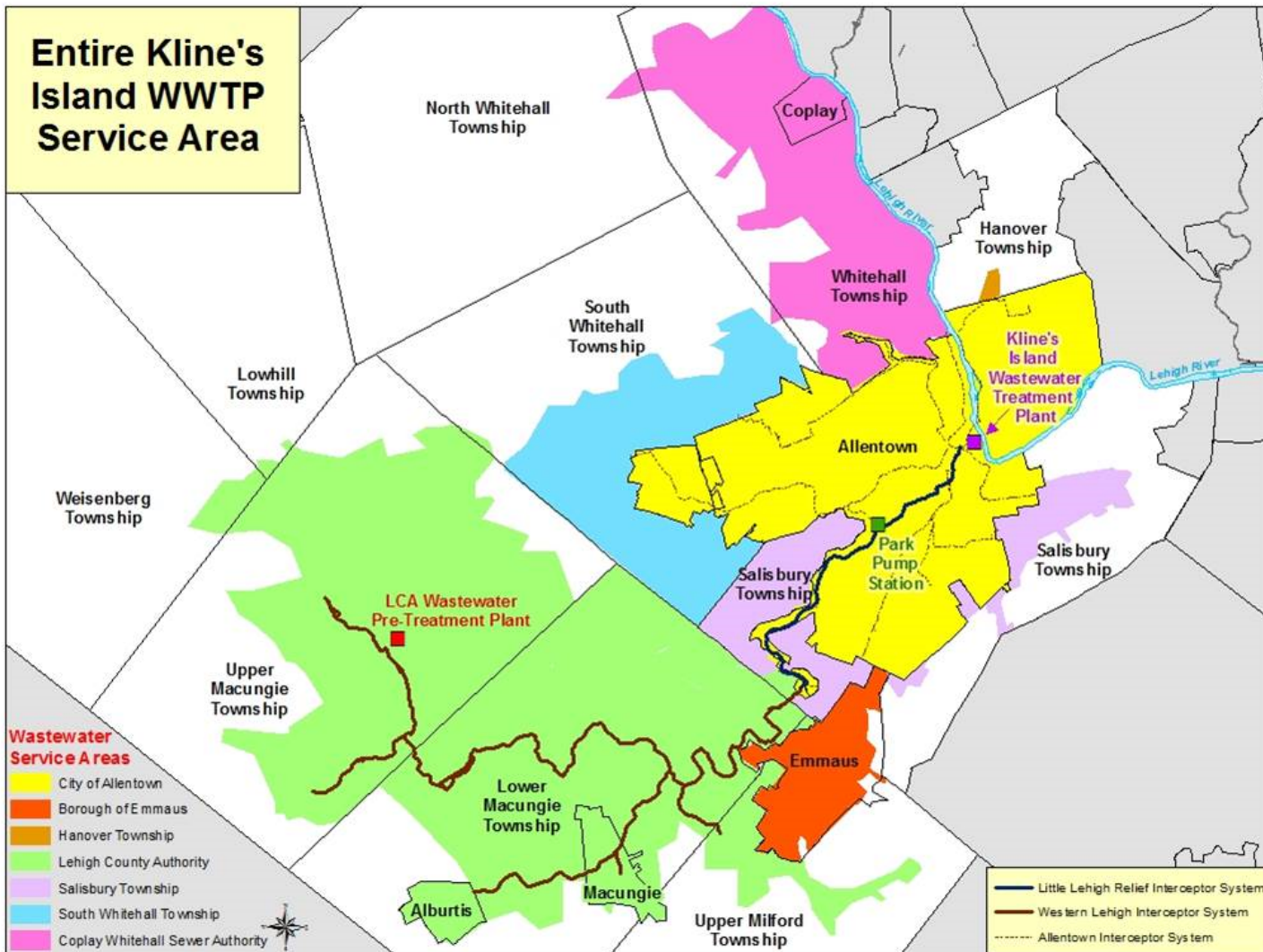


# Kline's Island Sewer System Long-Term Act 537 Plan Update Final Alternatives Analysis

LCA Board of Directors  
August 28, 2023





# Major System Challenges & Planning Drivers

01

## **Aging infrastructure**

→ wet-weather flows;  
sewer overflows;  
regulatory non-compliance

02

## **Size of existing infrastructure**

→ makes overflow  
issues worse; restricts  
economic  
development generally

03

## **Pretreatment plant age & capacity**

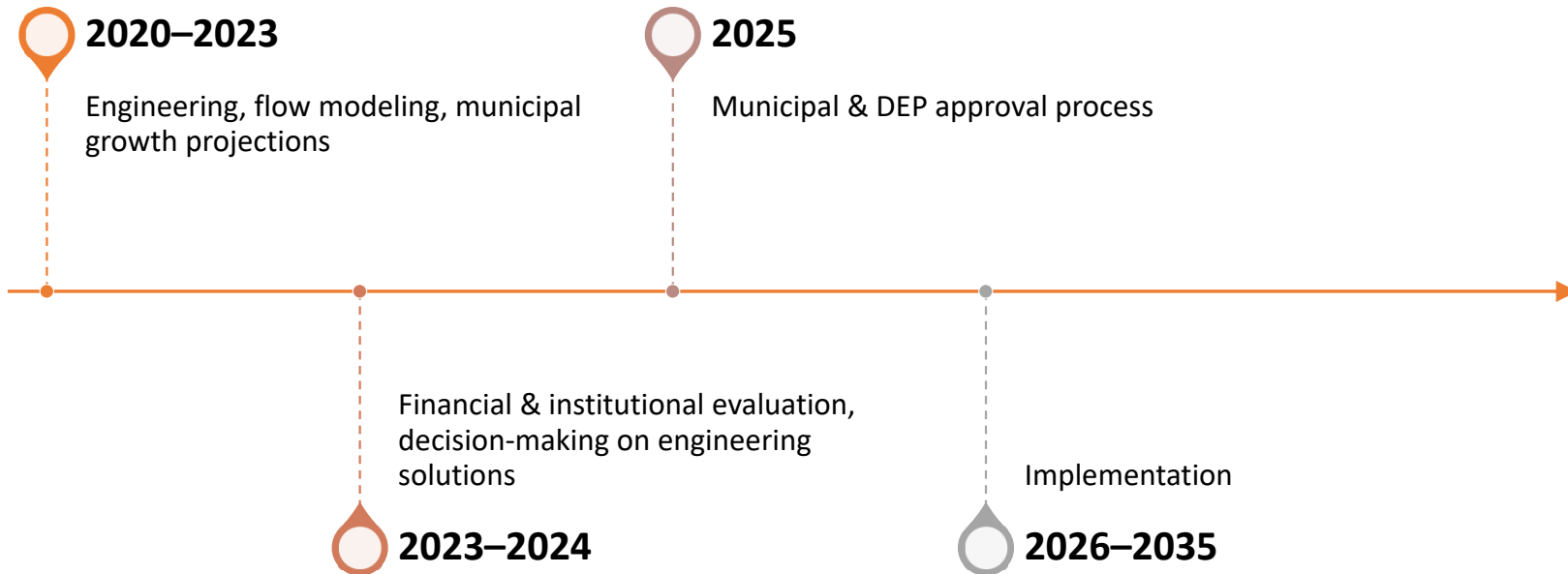
→ restricts  
manufacturing growth  
specifically

# What else must an Act 537 Plan include?

- All-inclusive solutions (including routine repair & rehab projects)
- Future flow projections, plan accommodate planned growth
- Financing plan & rate projections
- Implementation plan & institutional structure

# Timeline

*NOTE: Our commitment to PA Dept. of Environmental Protection is to develop a regional Act 537 Plan by March 2025*



# Solutions (Engineering Analysis: 90% Complete)

01

**Aging infrastructure**

SOLUTION: Municipal sewer rehab program

02

**Size of existing infrastructure**

SOLUTION: Parallel interceptors, pump stations & City treatment plant upgrades

03

**Pretreatment plant age & capacity**

SOLUTION: Major plant upgrades & capacity expansion

# Major Plan Components

## Kline's Island WWTP

- Wet-weather capacity enhancements (increase peak capacity to 120 million gallons per day)
- Master plan facility improvements

## Core Conveyance System

- Little Lehigh Interceptor upgrade
- Western Lehigh Interceptor (WLI) upgrade

## Pretreatment Plant

- Capacity expansion
- Master plan facility improvements

## Municipal Sewer Collection Systems

- Inflow & infiltration source reduction programs

## Inflow-Challenged Interceptors

- Signatory-specific interceptors, addressed through I&I programs or parallel interceptor projects



## Alternative 1:

## Western Lehigh Interceptor PARALLEL

### Legend

#### New or Expanded Pump Station

- New Kline's Island Lift Station
- Rabenold Pump Station

#### Paralleled or Replaced Pipe Diameters (in)

- 8 - 10
- 12
- 15 - 18
- 21 - 27
- 30 - 36
- 48
- 54
- 60
- All KISS Pipes

Final Alternative 1a Summary		
No.	Paralleled Gravity Pipes	Comment
1	Industrial Blvd Trunkline	Parallel extends upstream of interceptor
2	Iron Run Trunkline	Partial
3	Berengsville Trunkline	Partial
4	Upper Western Lehigh Interceptor	Partial
5	Upper Macungie Trunkline	Partial
6	Middle Western Lehigh Interceptor Spring Creek	
7	Alburtis Macungie Trunkline	Partial, upstream branch paralleled
8	Lower Western Lehigh Interceptor	Partial
9	Cedarcrest Trunkline	Partial
10	Little Cedar Creek Trunkline	Partial
11	Trout Creek Interceptor	Parallel extends upstream of interceptor
12	Trout Creek Relief Interceptor	Partial
13	Coplay Whitehall Lehigh Interceptor	Partial
14	Alertown Emmaus Interceptor	Partial, downstream of PPS to MLK Interceptor
15	Alertown Emmaus Interceptor	Replace with 48"
16	New MLK Interceptor	Construct 60"
<b>New and Expanded Force Mains and Pump Stations</b>		
17	Rabenold PS Expansion and Force Main Upsize	6 MGD. Replaced with 18"
18	New Kline's Island Lift Station	134 MGD max (34 MGD capacity for new lift station)

Paralleled or Replaced Gravity Pipes Summary		
Diameter (in)	Pipe Length (ft)	No. Segments
8	1,440	8
10	1,325	9
12	2,414	10
15	16,261	78
16	441	3
18	42,704	175
21	2,521	11
24	7,278	42
27	19,006	85
30	23,301	109
36	24,053	107
48	4,371	23
54	18	1
60	11,040	32
Total	156,174	693

New or Replaced Force Mains Summary		
Location	Diameter (in)	Pipe Length (ft)
RPS Replacement	18	6,465
Total		6,465

Lehigh County Authority  
Final Analysis of Alternatives  
KISS Act 537 Program

FINAL ALT 1A- KISS MODEL - 2050 FLOWS - 5 YR STORM  
PPS ABANDONED - GRAVITY MAINS - SIGNATORY 1 SRP



**Legend**

**New or Expanded Pump Station**

- New Kline's Island Lift Station
- Rabenold Pump Station
- Spring Creek Pump Station
- PTP Effluent Pump Station

**Paralleled or Replaced Pipe Diameters (in)**

- 8 - 10
- 12
- 15 - 18
- 21 - 27
- 30
- 36
- 42
- 60

**PTP EPS FM**

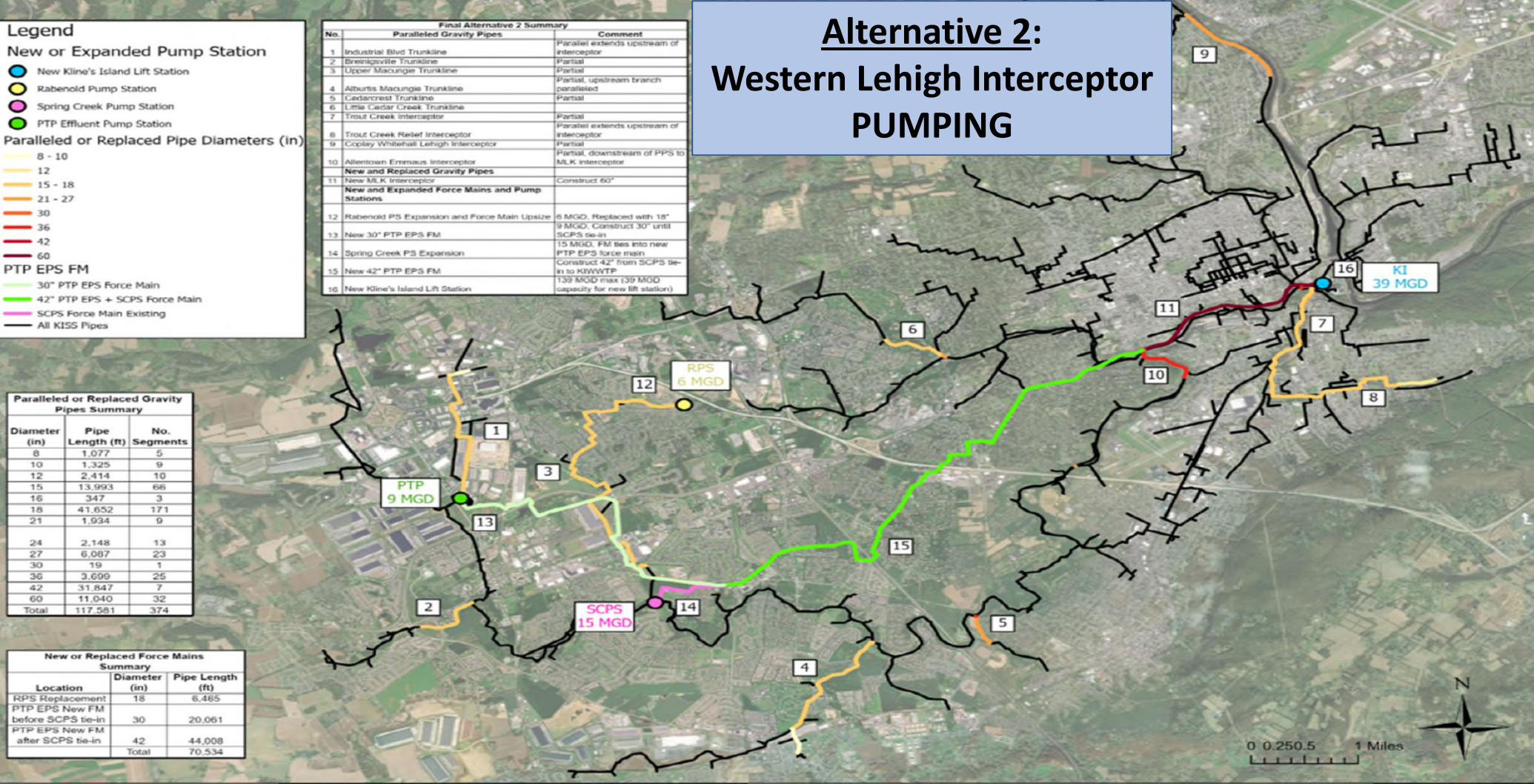
- 30" PTP EPS Force Main
- 42" PTP EPS + SCPS Force Main
- SCPS Force Main Existing
- All KISS Pipes

Final Alternative 2 Summary		
No.	Paralleled Gravity Pipes	Comment
1	Industrial Blvd Trunkline	Parallel extends upstream of interceptor
2	Brentsville Trunkline	Partial
3	Upper Macungie Trunkline	Partial, upstream branch paralleled
4	Alburtis Macungie Trunkline	Partial
5	Cedarcrest Trunkline	Partial
6	Little Cedar Creek Trunkline	Partial
7	Trout Creek Interceptor	Parallel extends upstream of interceptor
8	Trout Creek Relief Interceptor	Partial
9	Coplay Whitehall Lehigh Interceptor	Partial, downstream of PPS to MLK Interceptor
10	Allentown Emmaus Interceptor	Construct 60"
11	New MLK Interceptor	Construct 60"
12	Rabenold PS Expansion and Force Main Upsize	6 MGD, Replaced with 18"
13	New 30" PTP EPS FM	9 MGD, Construct 30" until SCPS tie-in
14	Spring Creek PS Expansion	15 MGD, FM ties into new PTP EPS force main
15	New 42" PTP EPS FM	Construct 42" from SCPS tie-in to KRWVTP
16	New Kline's Island Lift Station	139 MGD max (139 MGD capacity for new lift station)

# Alternative 2: Western Lehigh Interceptor PUMPING

Paralleled or Replaced Gravity Pipes Summary		
Diameter (in)	Pipe Length (ft)	No. Segments
8	1,077	5
10	1,325	9
12	2,414	10
15	13,993	66
16	347	3
18	41,652	171
21	1,934	9
24	2,148	13
27	6,087	23
30	19	1
36	3,699	25
42	31,847	7
60	11,040	32
Total	117,581	374

New or Replaced Force Mains Summary		
Location	Diameter (in)	Pipe Length (ft)
RPS Replacement	18	6,485
PTP EPS New FM before SCPS tie-in	30	20,061
PTP EPS New FM after SCPS tie-in	42	44,008
Total		70,534



## Cost Analysis:

### *Act 537 projects to be completed 2026-2035*

Major Plan Component	Alternative 1 – WLI Parallel	Alternative 2 – WLI Pumping
Kline's Island WWTP	\$50,500,000	\$50,500,000
Little Lehigh Interceptor	\$28,900,000	\$22,700,000
Western Lehigh Interceptor (WLI)	\$72,800,000	\$97,600,000
Pretreatment Plant	\$267,073,000	\$267,073,000
Municipal I&I Source Reduction	\$89,750,000	\$89,750,000
Inflow-Challenged Interceptors	\$67,800,000	\$60,200,000
<b>Total Cost Estimate*</b>	<b>\$576,823,000</b>	<b>\$587,823,000</b>

*\* Cost estimates are shown in 2023 dollars and include capital expenses only. Full net present worth analysis, including O&M costs, is under development.*

# What factors will influence cost estimates?



## **Life-Cycle Costs**

- Expected useful life and future replacements
- Operational costs (pumping = power costs)
- Permitting & construction challenges



## **Level of Protection**

- Sizing to accommodate future climate change
- Impact on short-term and long-term costs (finding the right balance)



## **Pretreatment Plant**

- Value engineering review
- Industrial users' feedback
- Financing plan



## **These key decisions must be made this year!**

# Other major considerations

- **Gravity vs. pumping**
  - Carbon footprint
  - Ease of construction
  - Environmental concerns (working in floodplain)
  - Social concerns (working in major roadways)
- **Opportunities for collaboration on I&I programs**
  - Joint contracts
  - Standard methods
  - Centralized project tracking
- **Cost sharing, new agreements, rate impacts**

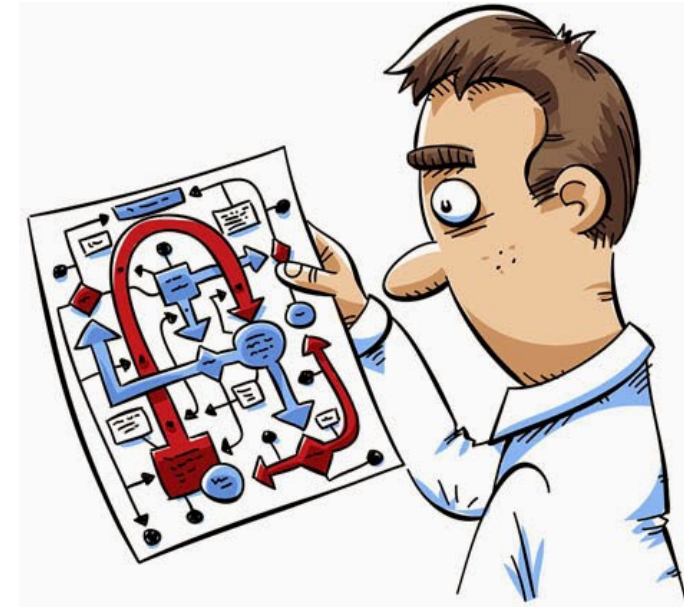




# LCA-Specific Questions

## 1. What is LCA's role in decision-making?

- Act 537 Plan adopted by municipalities, not LCA
  - Municipalities, not LCA, manage growth
  - LCA will fund & implement most of the projects
  - All costs pass through LCA in a very complicated way
  - Allentown Lease adds a layer of complexity
  - Many look to LCA to provide leadership!
- 
- *How would the LCA Board like to weigh in on key decisions?*



# LCA-Specific Questions

1. What is LCA's role in decision-making?

## 2. How much public input is desired?

- Continued deep collaboration with municipalities → ongoing
  - Present information to municipal boards/councils → start now
  - Key stakeholder outreach, phase 1 (1-1 visits) → ongoing
  - Key stakeholder outreach, phase 2 (blue ribbon panel) → start Fall 2023
  - Community forums → early 2024
  - Goal: Gather feedback before we write the final plan
- 
- *Feedback from the LCA Board on this approach?*





# LCA-Specific Questions

1. What is LCA's role in decision-making?
2. How much public input is desired?
- 3. How to draw conclusion on Pretreatment Plant projects?**
- 4. How will we implement all these projects?**

*Let's tackle these when we have more feedback & ideas to share?*

# Next Steps – Remainder of 2023

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1

Discuss public input and decision-making process with municipalities

2

Kick off public communications strategies

3

Make decisions (pretreatment plant approach, gravity vs. pumping, etc.)

4

Complete phase 2 financial analysis & develop cost-sharing approach (January 2024)

5

Get ready for final push – write the plan by September 2024!

# Discussion

LCA Board Perspectives?



Lehigh County Authority