Updated CSO Control Plans: Tools and Alternatives Development

November 15, 2023

DRAFT

zoom

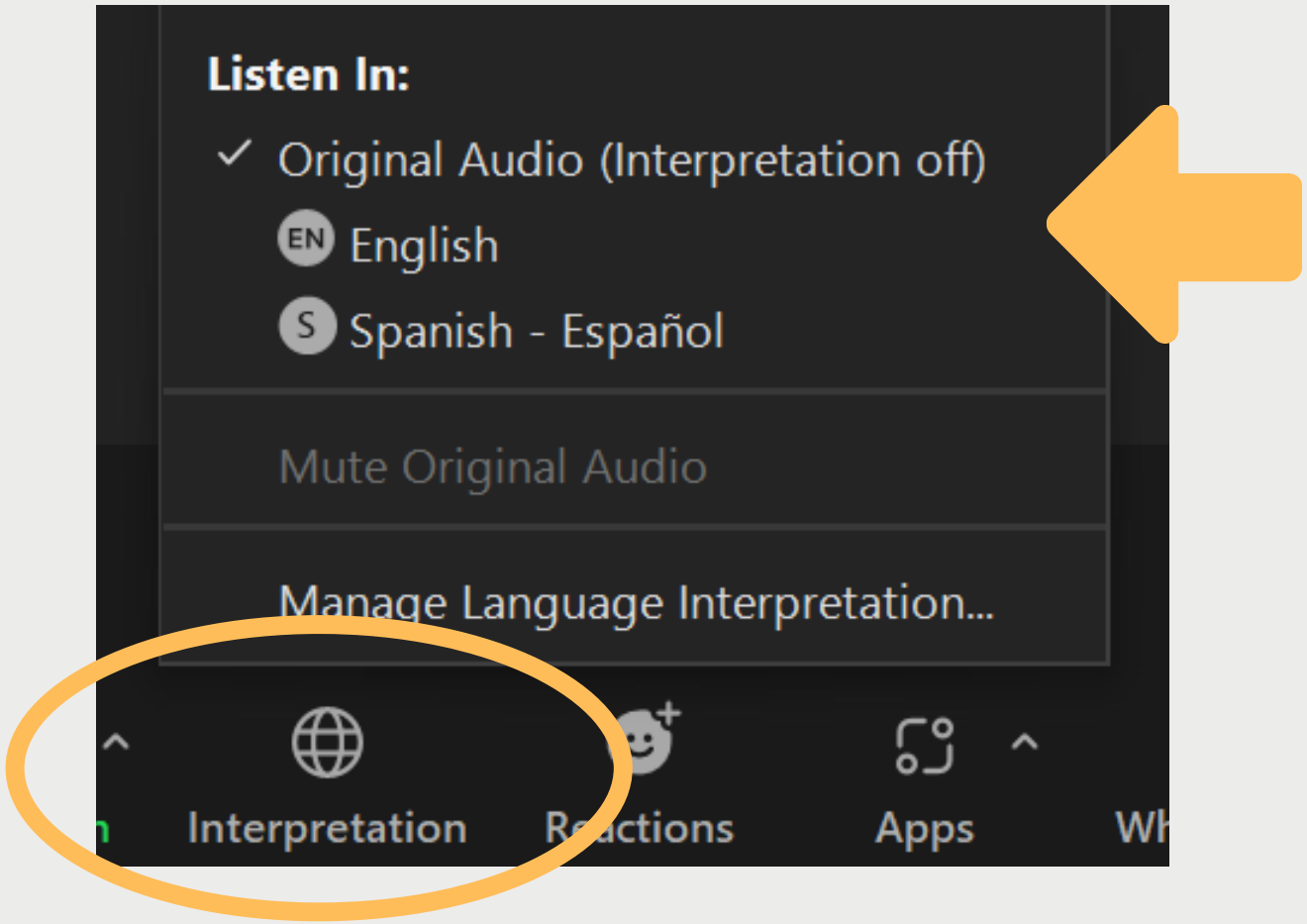
Interpretation

SOMERVIVA

OFFICE OF IMMIGRANT AFFAIRS

WE SPEAK YOUR LANGUAGE
HABLAMOS SU IDIOMA
FALAMOS A SUA LÍNGUA
NOU PALE LANG OU
हामी तपाईंको भाषा बोल्दछौं।
我们会说您的语言

Interpretation on a computer



Click on the globe symbol in the bottom right corner of your screen.

Select the option for the language you speak.

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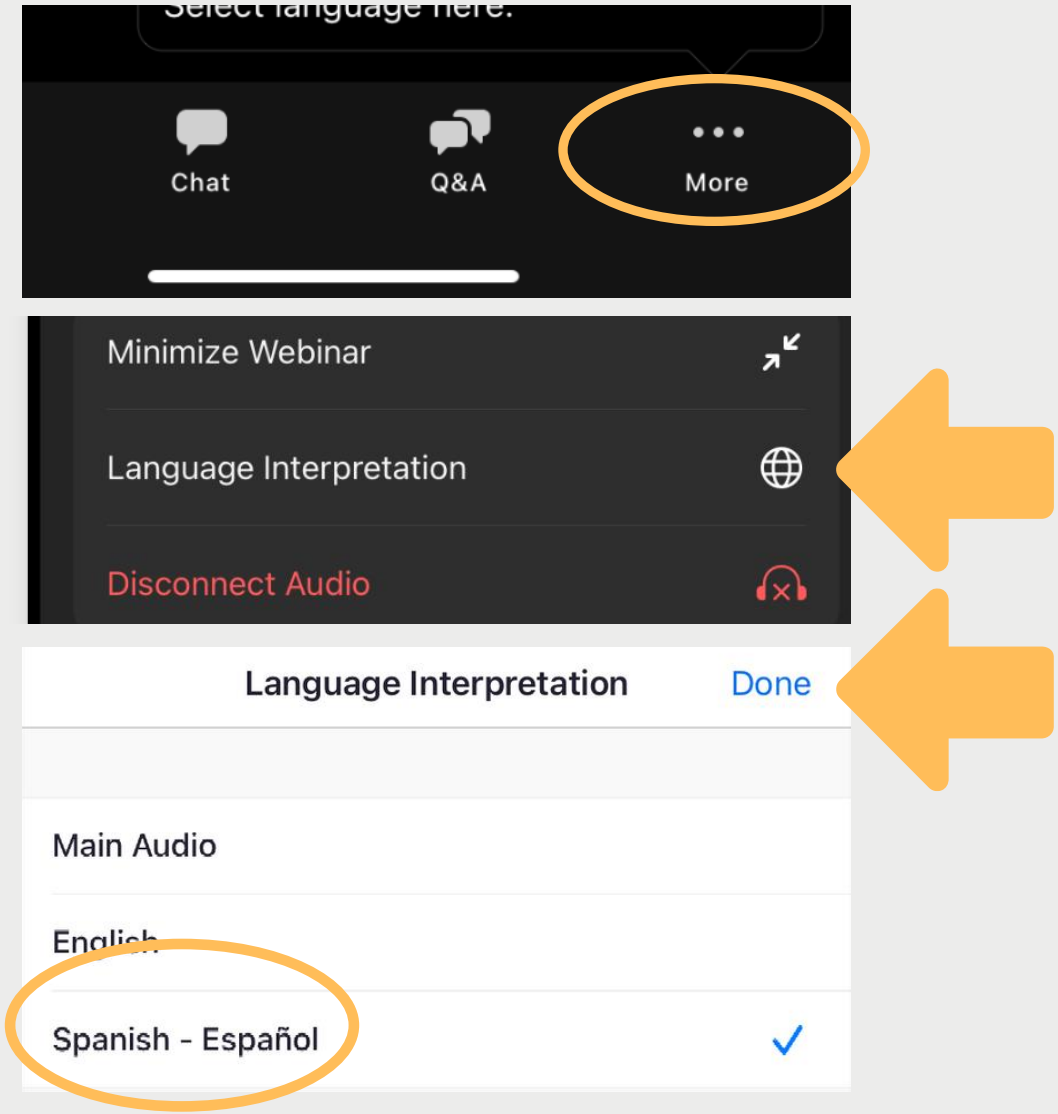
Interpretation on a smartphone



Click on the three dots in the bottom right corner of your screen.

Select the option with the globe symbol.

Select your language. Press "Done" in the top right corner.

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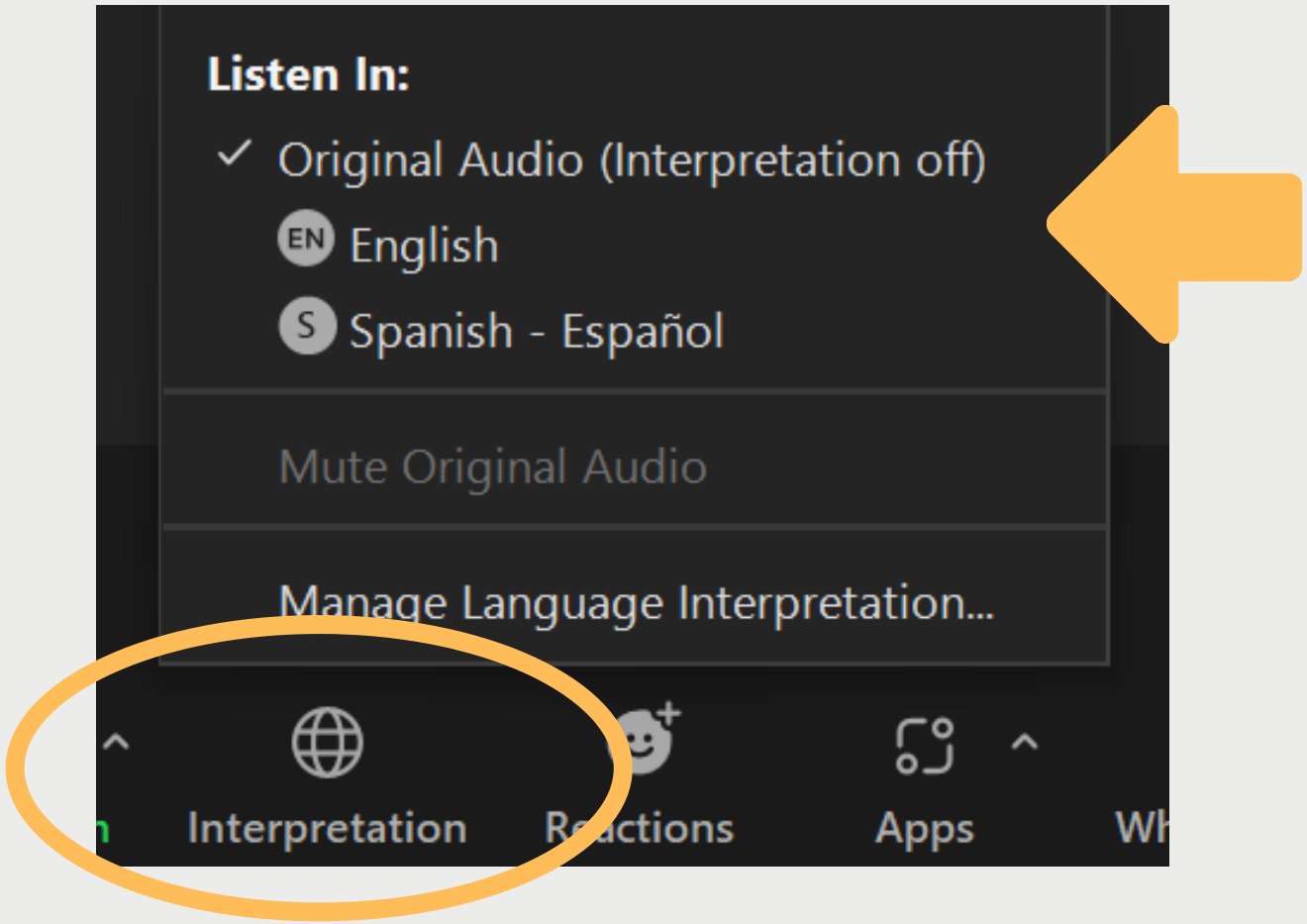
Interpretación

Interpretación en una computadora



Haga clic en el globo terráqueo ubicado en la esquina derecha abajo de su pantalla.

Seleccione la opción para el lenguaje que usted habla.

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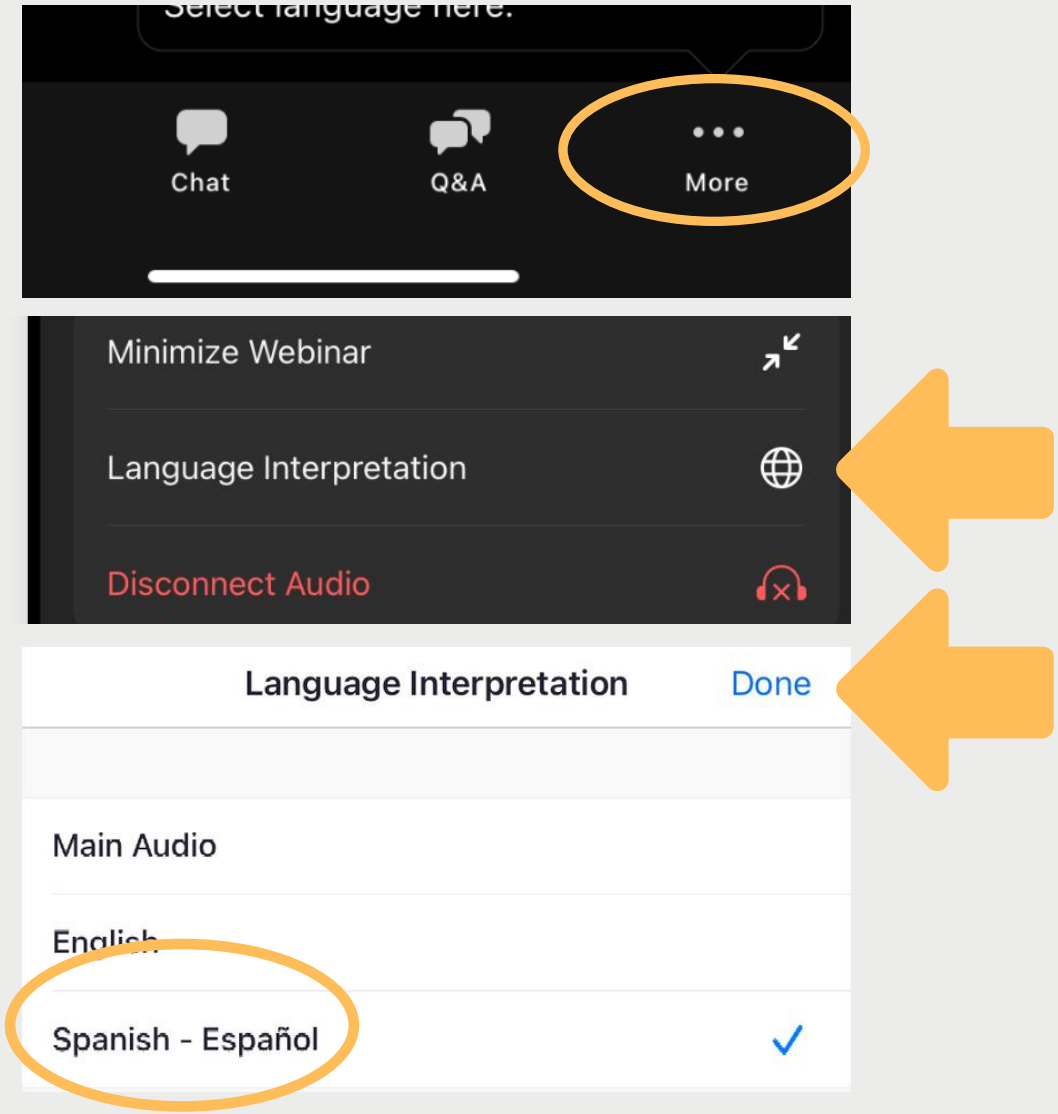
Interpretación en un teléfono inteligente



Haga clic en los tres puntos ubicados en la esquina derecha abajo de su pantalla.

Seleccione la opción con el símbolo de globo.

Seleccione su lenguaje. Presione “Done” arriba en la esquina derecha de su pantalla.

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Interpretação

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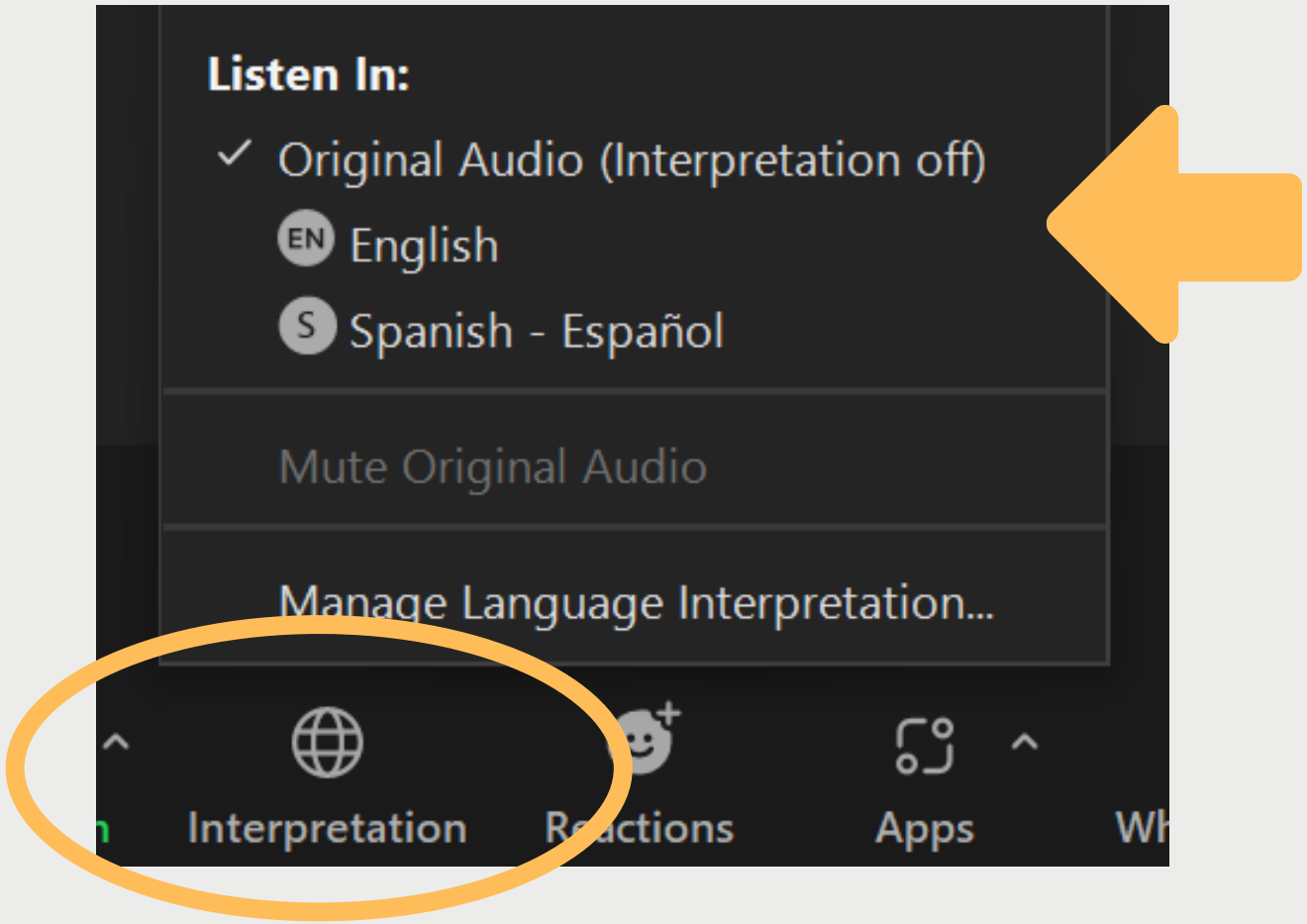
Interpretação em um computador



Clique no símbolo de um globo no canto inferior direito da sua tela.

Selecione a opção para o idioma que você fala.

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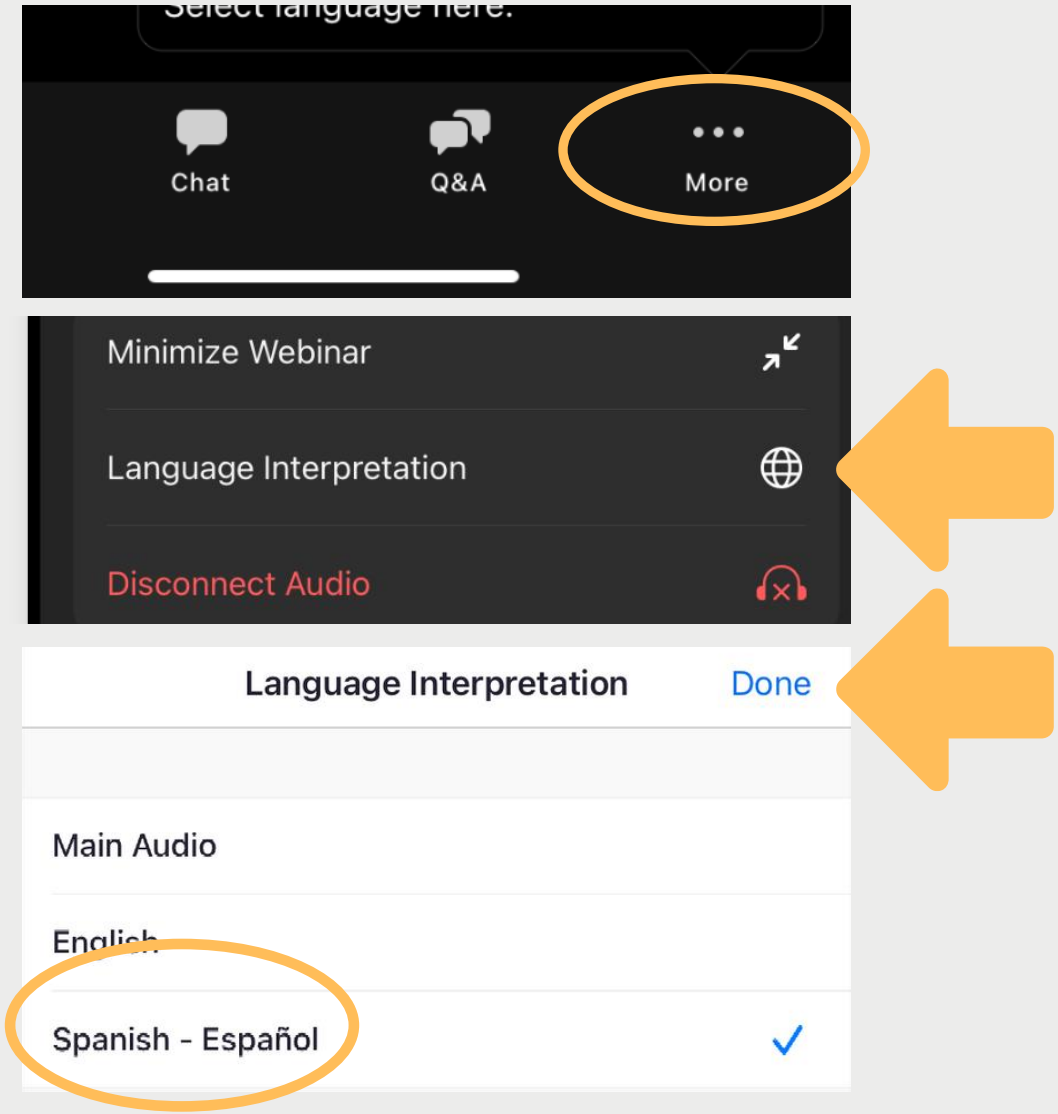
Interpretação em um celular smartphone



Clique nos três pontinhos no canto inferior direito da sua tela.

Selecione a opção com o símbolo de um globo.

Selecione o seu idioma. Aperte “Done” no canto superior direito.

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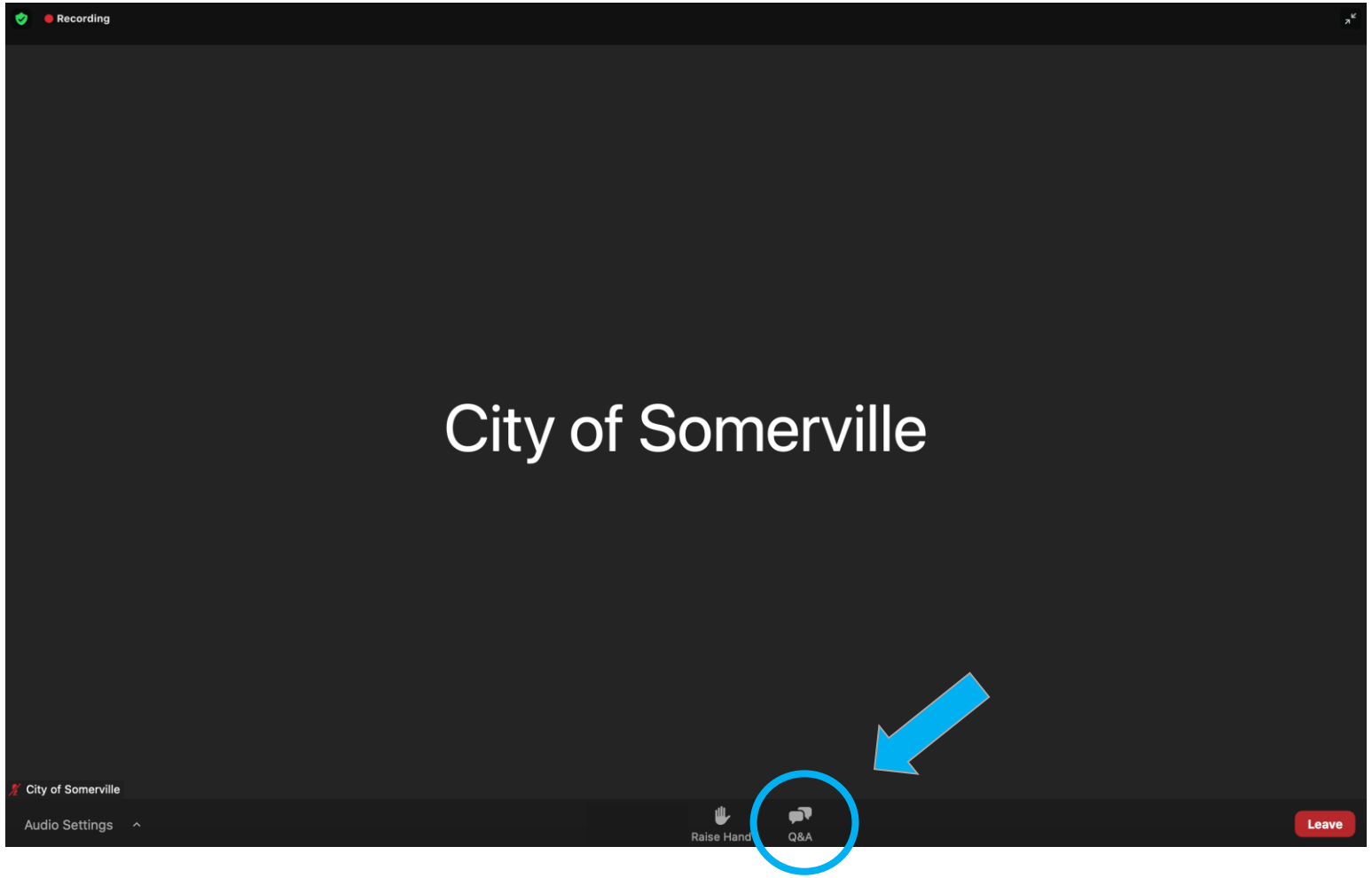
Interpretation will now begin.

La interpretación ahora comenzará.

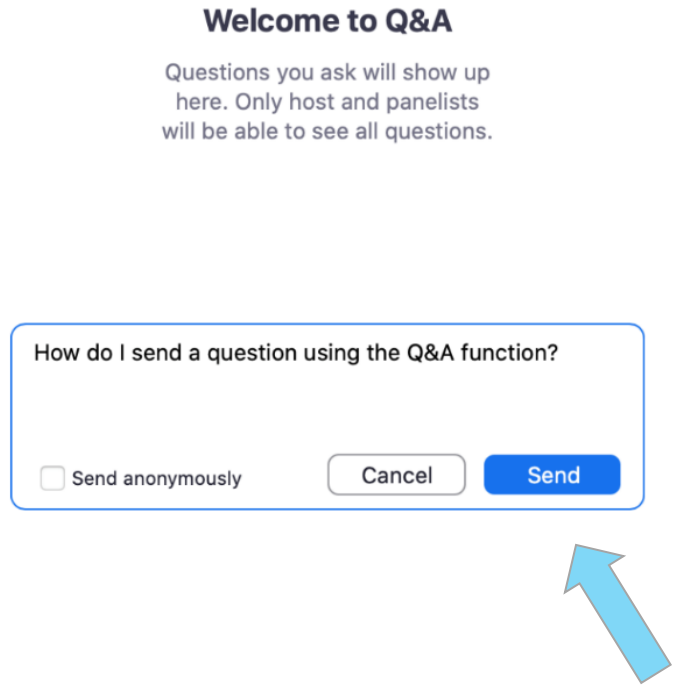
A interpretação começará agora.

How to Use Zoom's Q&A Function



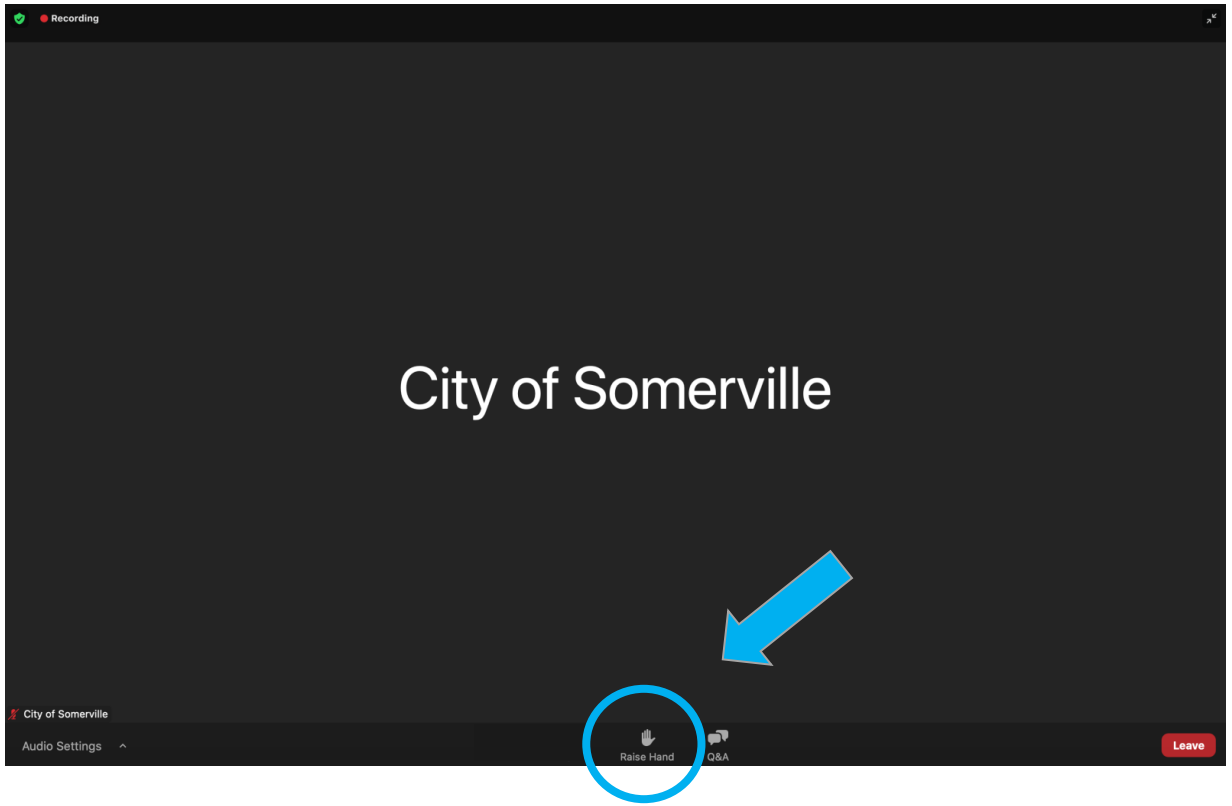
Click the "Q&A" button in the webinar controls bar

Type your question in the bottom of the Q&A window. Click "Send" to submit your question

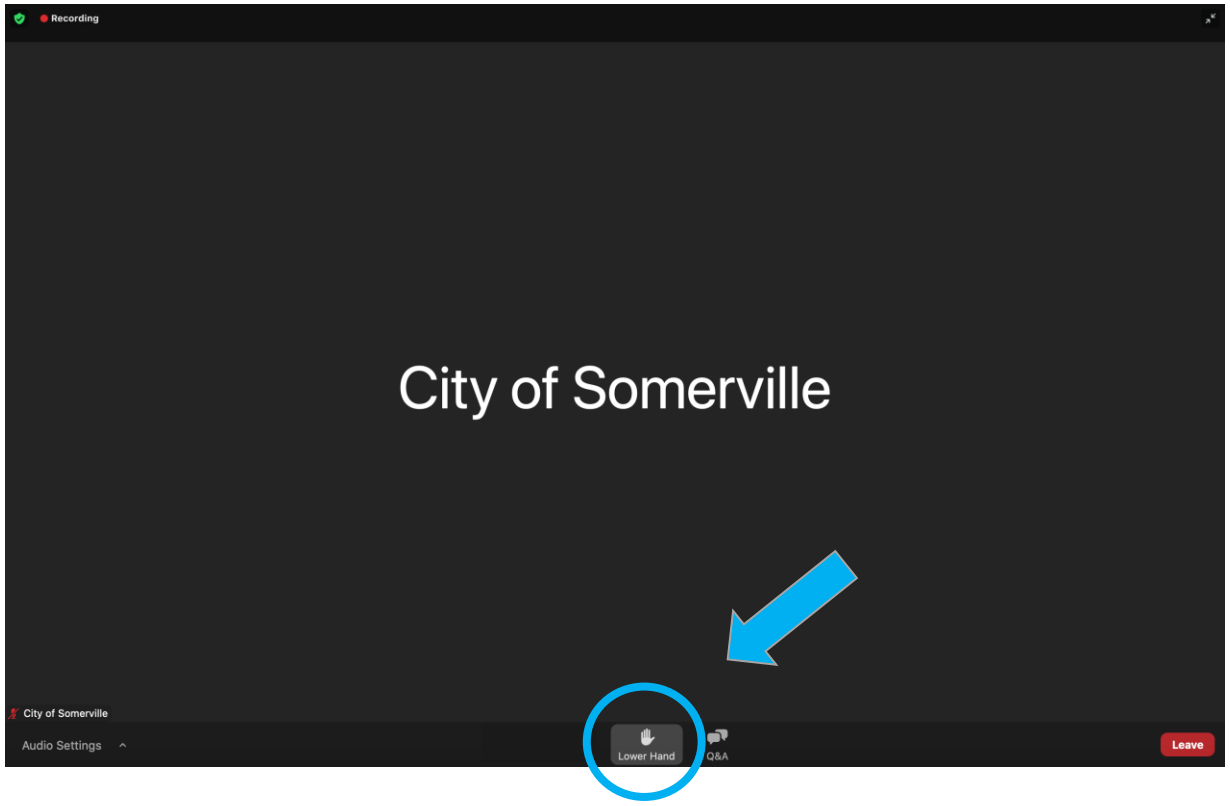


How to Raise Your Hand to Ask a Question

Click the “Raise Hand” button on the webinar controls toolbar



When your question has been answered, click “Lower Hand”



If you are experiencing technical difficulties, please call: 518-929-3234

If you are calling in: Dial *9 to raise your hand
Dial *6 to unmute and mute

Meeting Guidelines

- The meeting is being **recorded**.
- **Q&A function** is enabled for questions and any **technical issues** you might experience.
- You may **type questions** at any time using the Q&A feature.
- Please **raise your hand** if you wish to *ask questions*.
- Please limit your questions to **1 minute** per person so that we can hear from as many people as possible.

Please pace your speech to allow our interpreters time to translate.

Updated CSO Control Plans: Tools and Alternatives Development

November 15, 2023

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Agenda

1. Welcome
2. Overview of the Updated Combined Sewer Overflow (CSO) Control Plans Process and Regional Effort
3. CSO Control Toolbox
4. The Bigger Picture – Goals and Priorities
   - *Develop, Select, and Evaluate Alternatives*
   - *Participant Feedback*
5. Next Steps

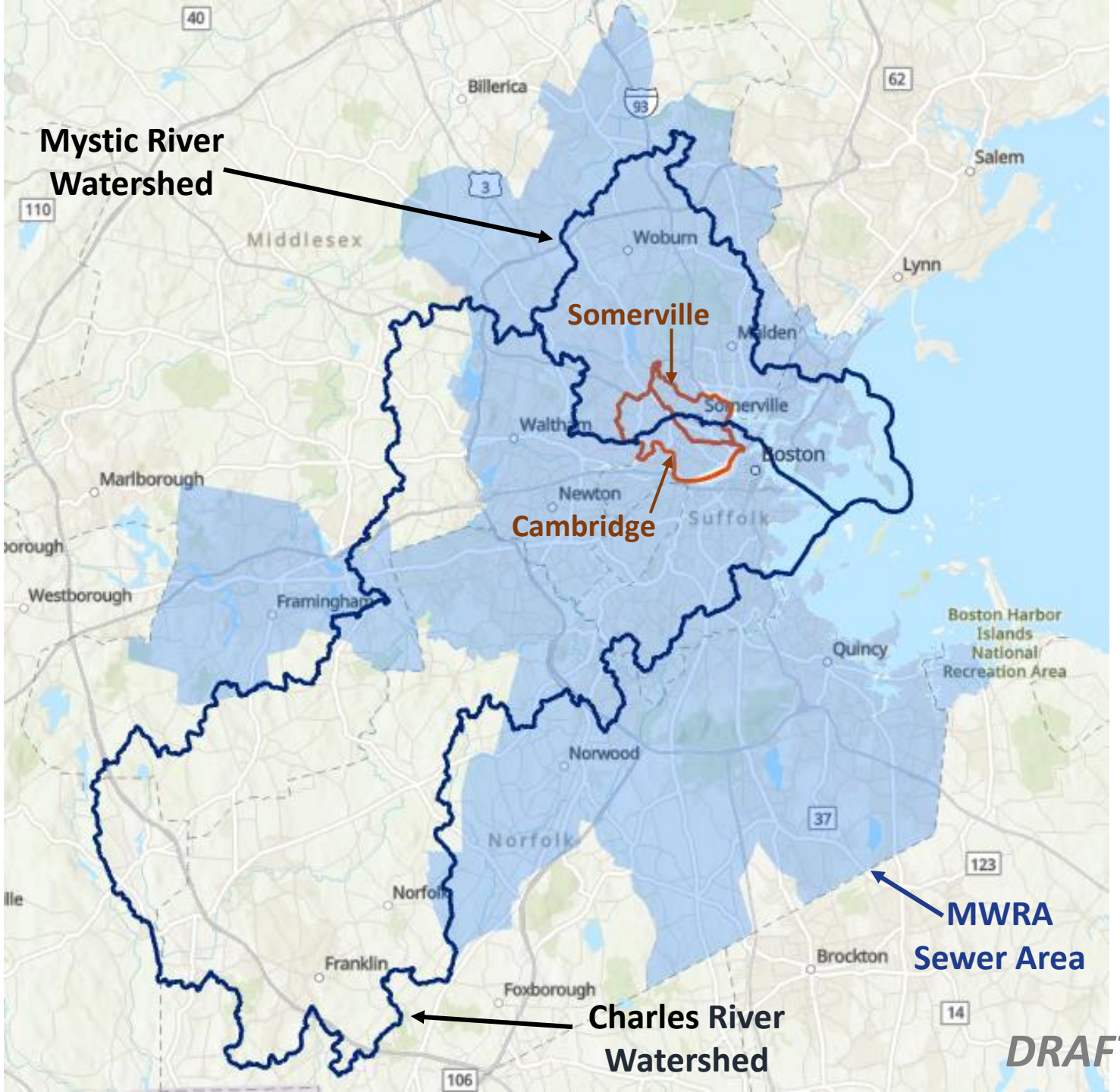
Who We Are

City of Somerville

City of Cambridge

Massachusetts Water Resources Authority (MWRA)

https://voice.somervillema.gov/joint-cso-planning



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Overview of the Updated CSO Control Plans Process & Regional Effort

What is a combined sewer overflow (CSO)?

Why do CSOs matter?

Updated CSO Control Plans
(Goals, Timelines, Modeling)

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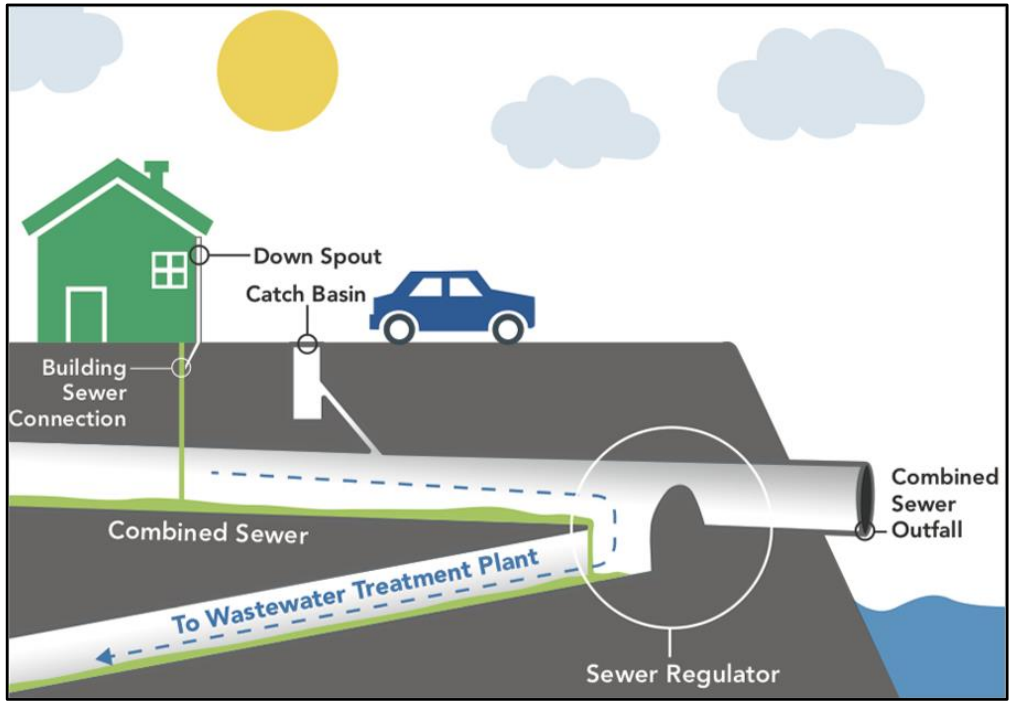
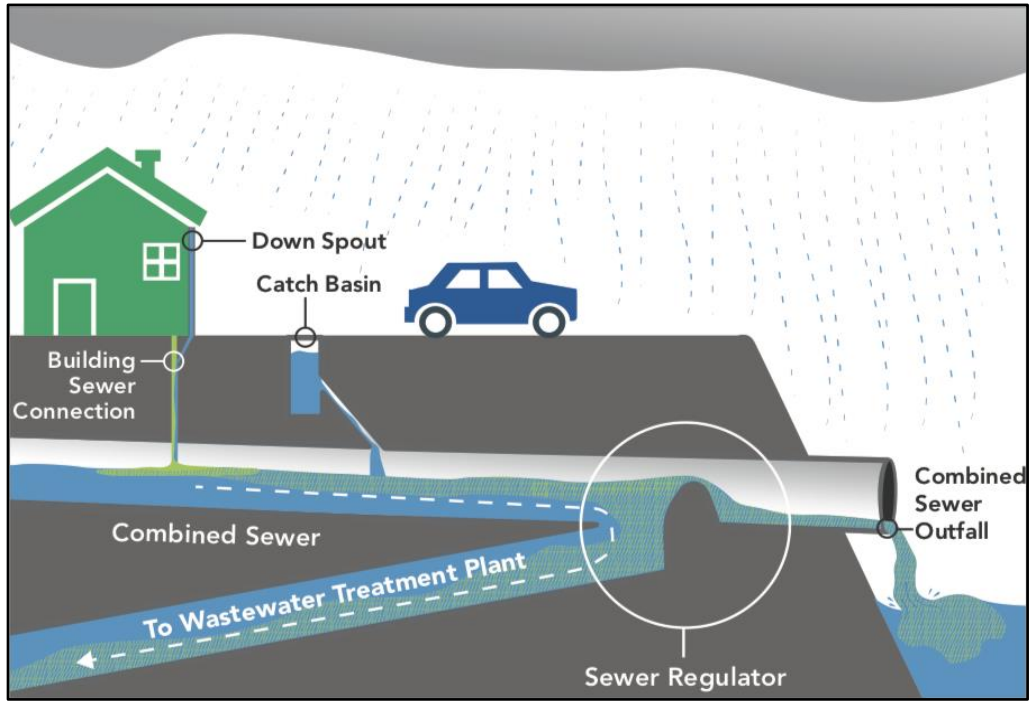
What is a combined sewer overflow (CSO)?

Combined System – No or Moderate Rain



Combined System – Heavy Rain



Sewage + Stormwater = Combined Sewer Overflows

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Why are combined sewer overflows allowed?

To protect our homes, streets, & neighborhoods from combined sewer flows

Sewer system can back-up into basements and garden-level apartments.

Sanitary Sewer Overflows (SSOs) release sewage in neighborhoods and can contribute to local flooding.

What is in combined sewer overflows?

Stormwater	Sewage	Combined Sewer Overflows
• Pathogens (bacteria, viruses) • Oil and grease • Nutrients (phosphorus, nitrogen) • Trash • Others	• Pathogens (bacteria, viruses) • Oil and grease • Wipes • Nutrients (phosphorus, nitrogen) • Pharmaceuticals • Industrial waste • Others	• Pathogens (bacteria, viruses) • Oil and grease • Wipes • Nutrients (phosphorus, nitrogen) • Pharmaceuticals • Industrial waste • Trash • Others

Negative impact on water quality, environmental health, and public health

Why do combined sewer overflow volumes change from year to year?

It's complicated. Main reason is that no two rainstorms are the same.

- How hard it is raining?
- How long does it last?
- Where does the rain fall?

Year	Rain[1] (inches)	Number of Heavy Rainstorms[2]	CSO Discharge Volumes[3] to Charles River, Mystic River and Alewife Brook (Million Gallons)
2021	60.03	11	237.73
2022	34.94	4	3.79

Footnotes:

1) Measured at Ward St Headworks
2) Storms with rainfall intensity greater than 0.4 in/hr
3) Metered CSO volumes

What should you do during and after combined sewer overflows?

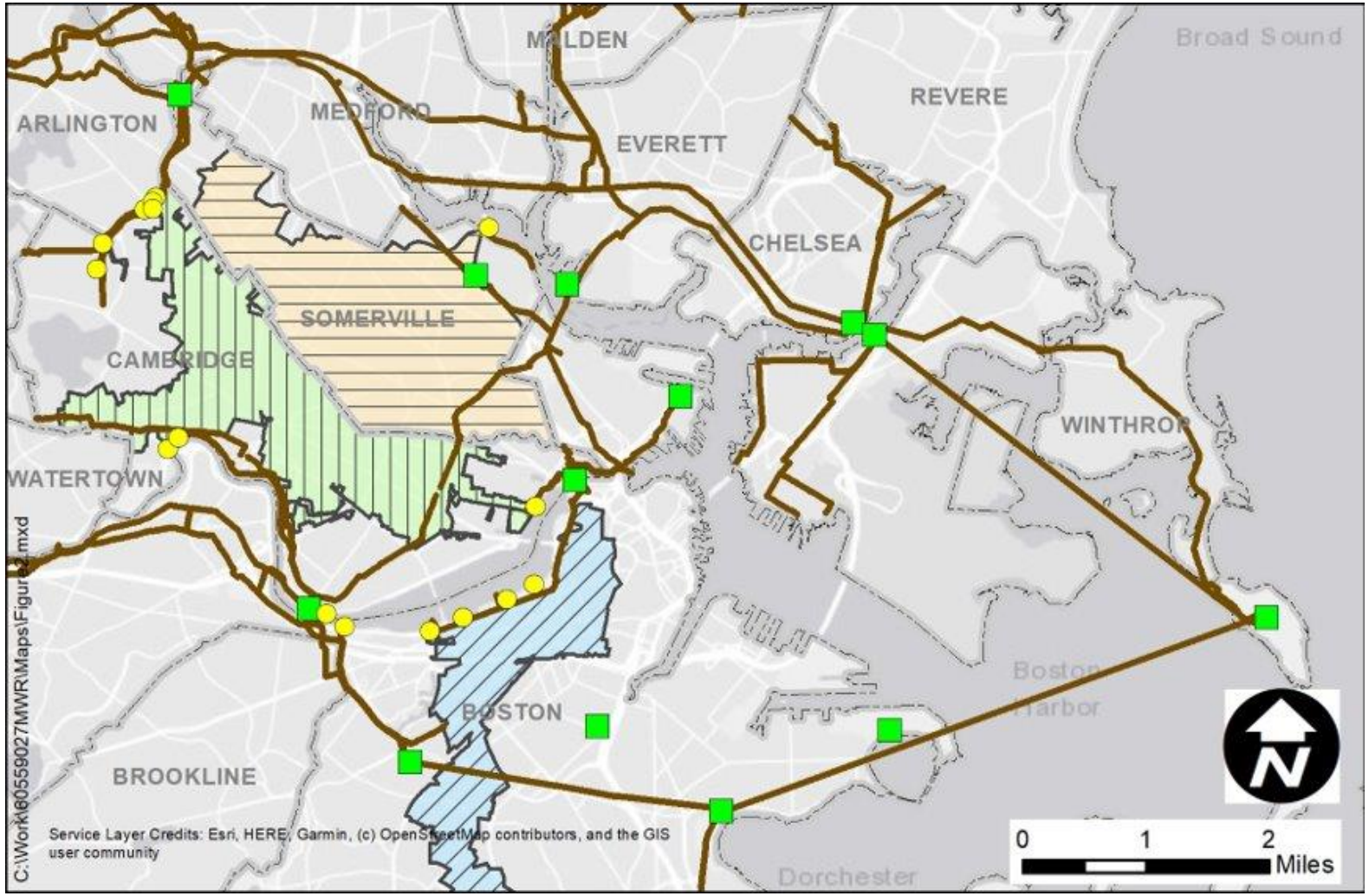
Avoid contact with the water for **48 hours** (2 days) during and after heavy rain.

Sign up for CSO notifications:

MWRA: https://bit.ly/mwrareports
Cambridge: https://www.cambridgema.gov/subscribe
Somerville: https://www.somervillema.gov/cso

What are we doing now about combined sewer overflows?

Three (Cambridge, Somerville, and MWRA) Updated CSO Control Plans with the overall goal to reduce or eliminate CSOs



LEGEND

- MWRA Interceptor
- MWRA Facility
- CSO Outfall
- Combined area tributary to MWRA outfalls discharging to the Charles River
- Combined areas in Somerville
- Combined areas in Cambridge

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What is the timeline of the three Updated CSO Control Plans?

2022

- Public Meeting #1: Overview of CSOs
- Public Meeting #2: Typical year development, goals, priorities

2023

- **Public Meeting #3: CSO control tools and alternatives**

2024

- Public Meeting #4: Alternatives screening & affordability analysis

2025

- Public Meeting #5: Alternative screening results

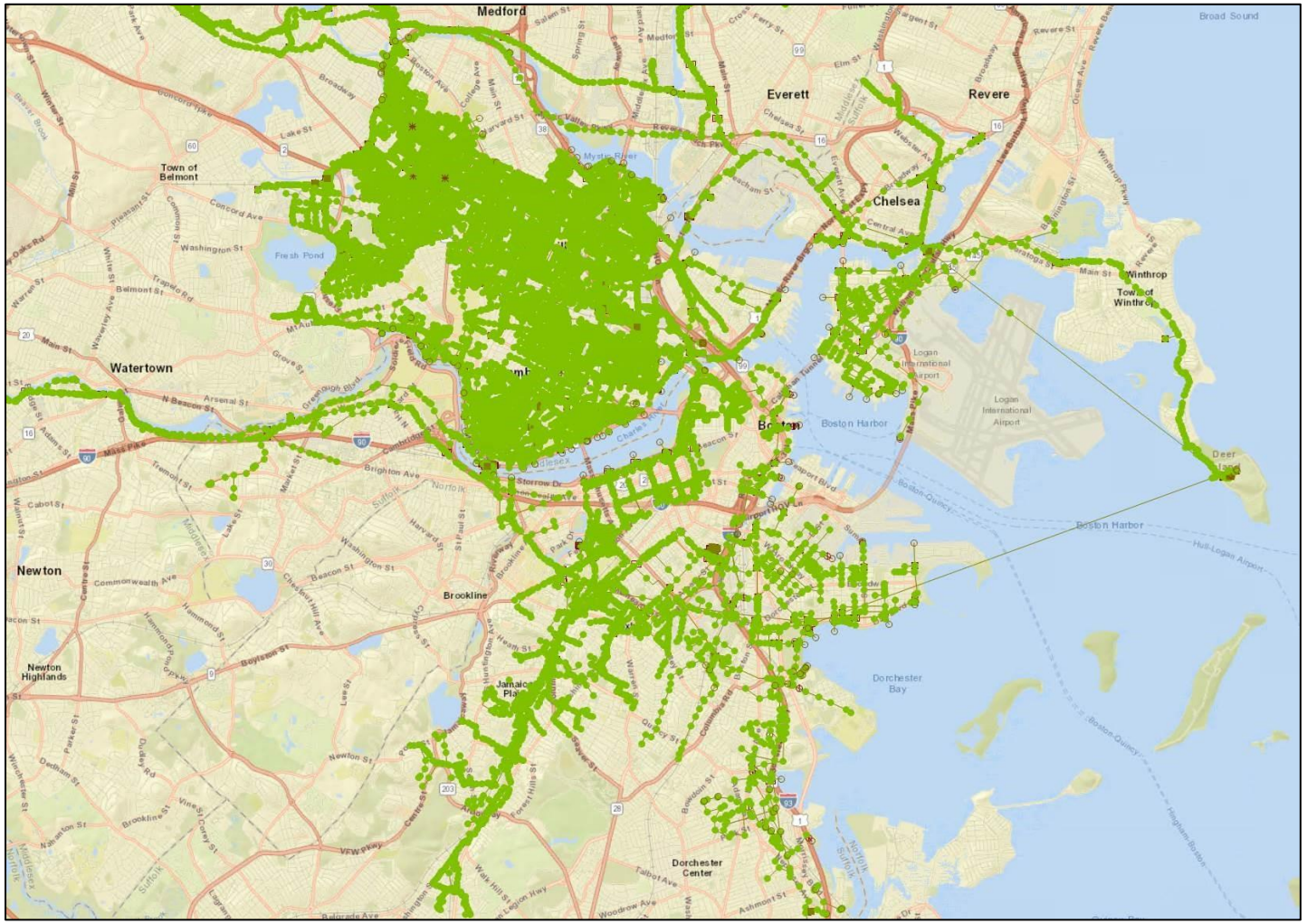
2026

- Public Meeting #6: Draft CSO control plans
- Public Meeting #7: Final CSO control plans

What are we using?

Unified (Compiled) Computer Model

- Digital model of pipes, combined sewer overflow outfalls, pump stations, and treatment facilities
- MWRA, Cambridge, and Somerville each have their own models
- Combined the three models to produce consistent results



Pipe Network in the Unified Model

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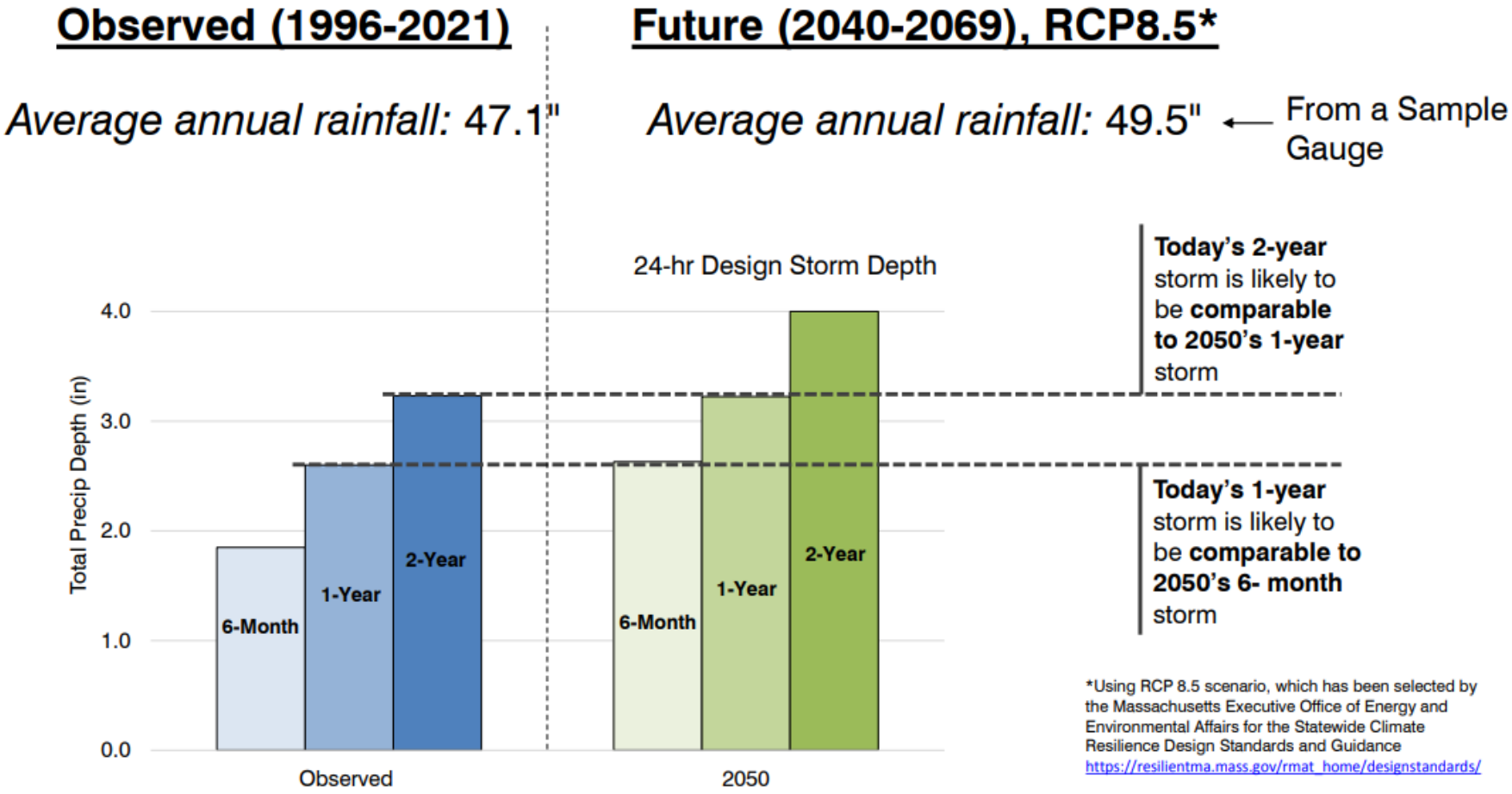
What will future rain look like?

- As our climate continues to change, more intense and heavier rainfall will make flooding and CSOs worse in the region.
- Based on climate prediction tools larger rainstorm are predicted to occur more often.



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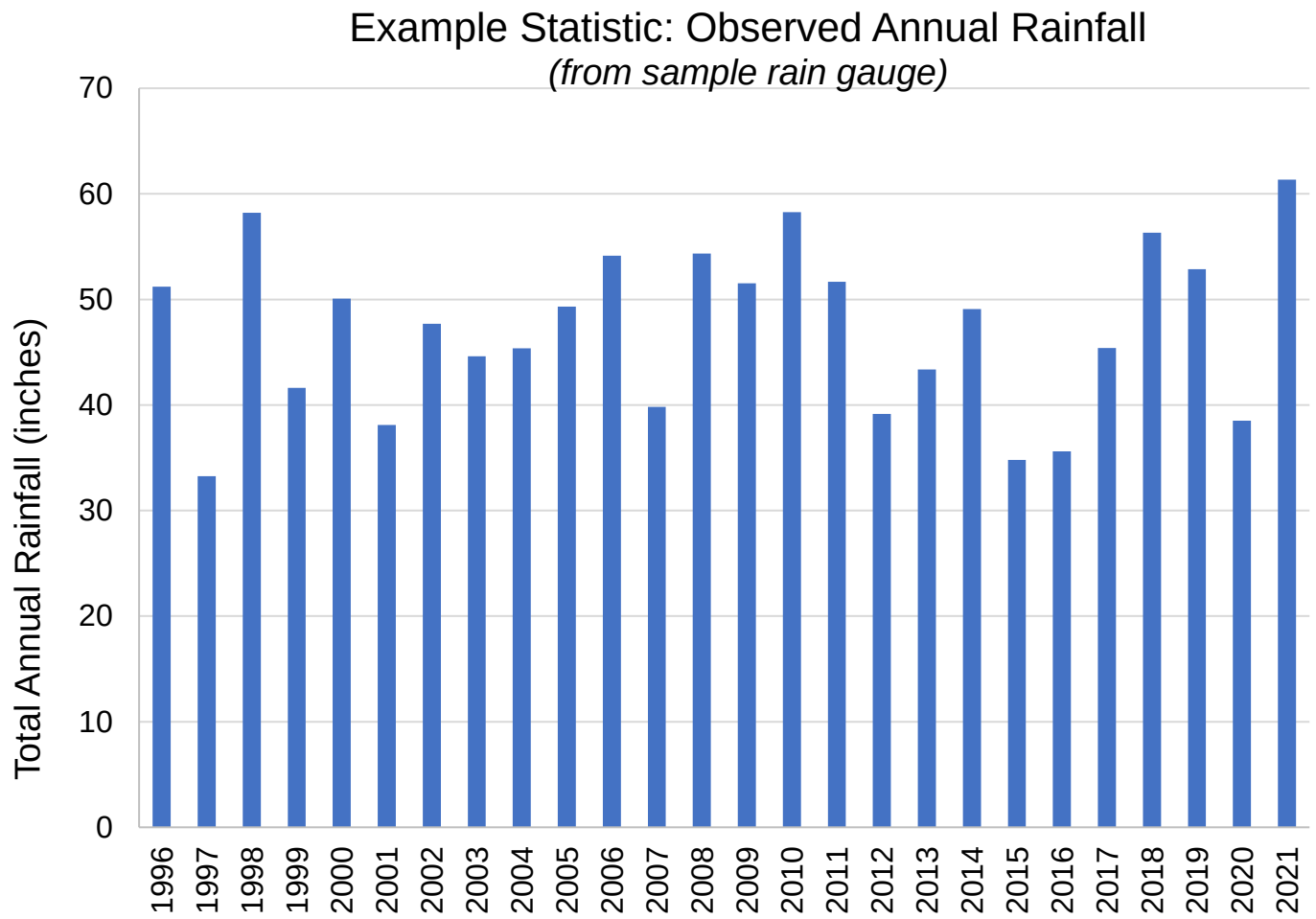
What is a Typical Year?

- A full year of rain data that best represents rain over time
- A representative "average" year for planning, as rain changes from year to year



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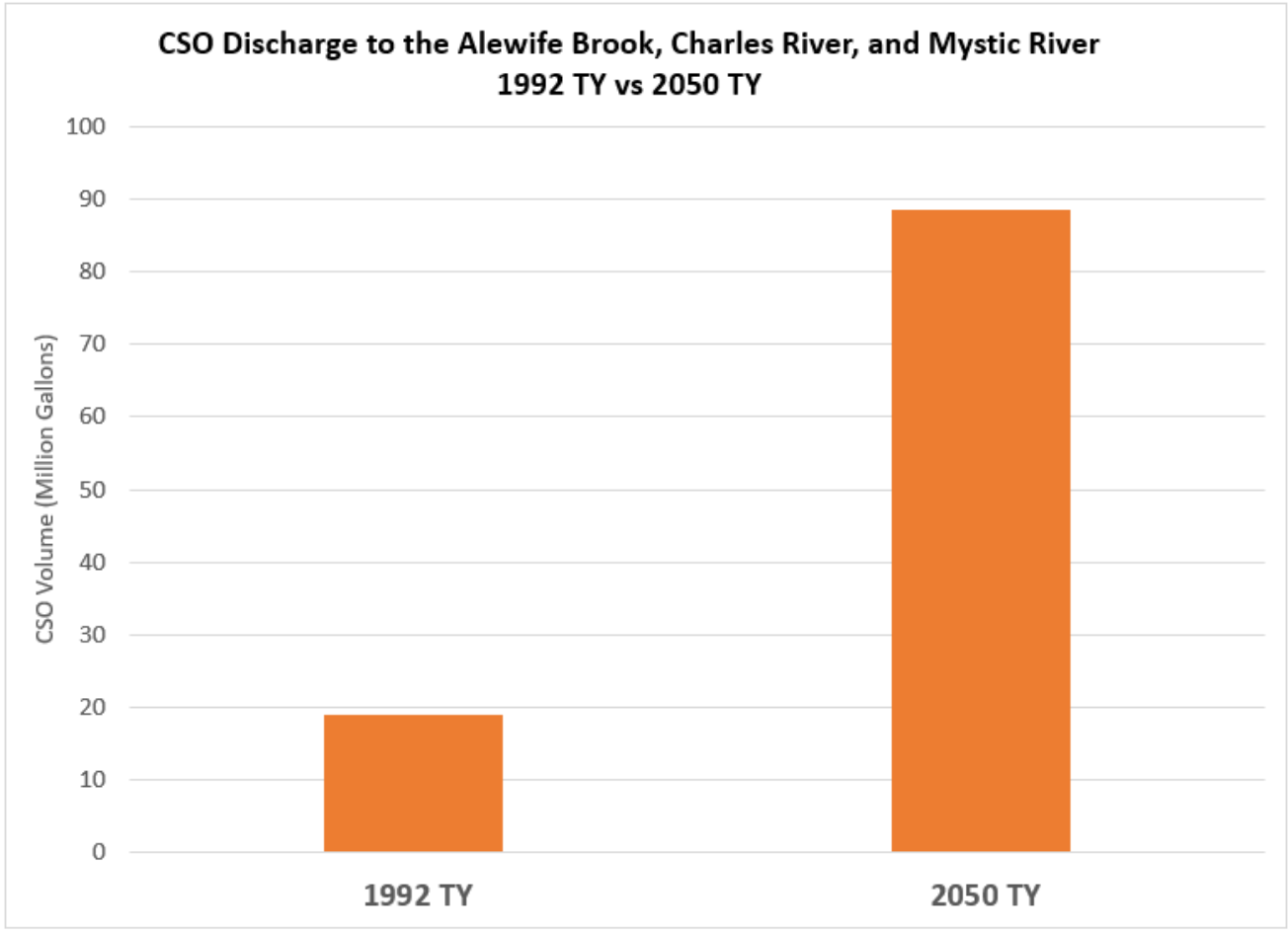
2050 Typical Year (TY) and beyond?

2050 Typical Year:

- One year of rainfall that reflects the future
- Developed using future climate change projections for precipitation, temperature, and tides
- Consistent way to compare alternatives
- Way to measure progress once plan is in place
- Improves on EPAs CSO Policy

Design Storms:

- Rainstorms larger than those included in the 2050 TY.
- Will also be used to evaluate alternatives



System Conditions are the same for both model results. Only precipitation, temperature, and tides have changed.

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CSO Control Toolbox

Our Tools for Reducing or Treating CSOs

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CSO Tools

Reducing CSO volumes

- Sewer Separation
- Green Stormwater Infrastructure
- Inflow/infiltration reduction
- Storage
- Conveyance

Treating CSOs

- Treatment

Developing CSO Control Alternatives

What are CSO control alternatives?

A suite of CSO control tools that, in combination, meet a range of CSO reduction targets.

TOOLS ARE
THE BUILDING BLOCKS
FOR ALTERNATIVES.

Sewer separation
Green stormwater infrastructure
Inflow / infiltration reduction
Storage
Conveyance
Treatment

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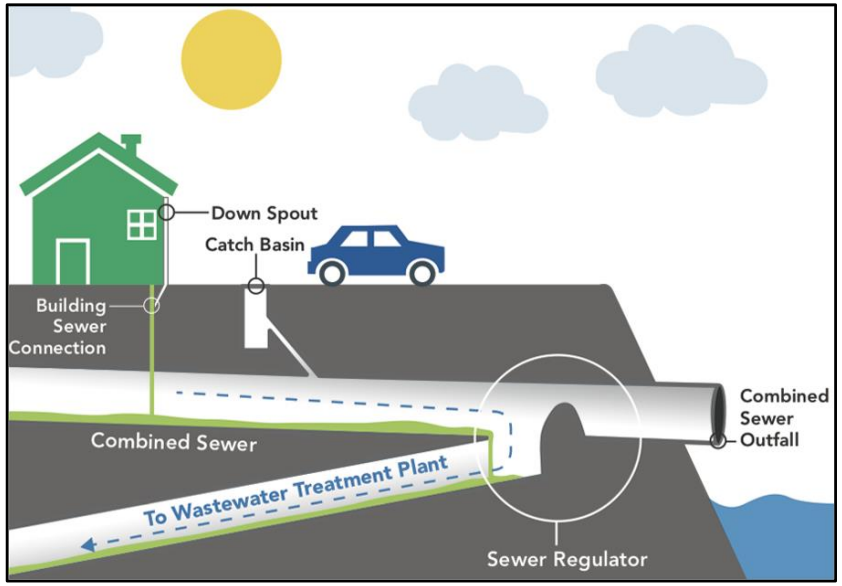
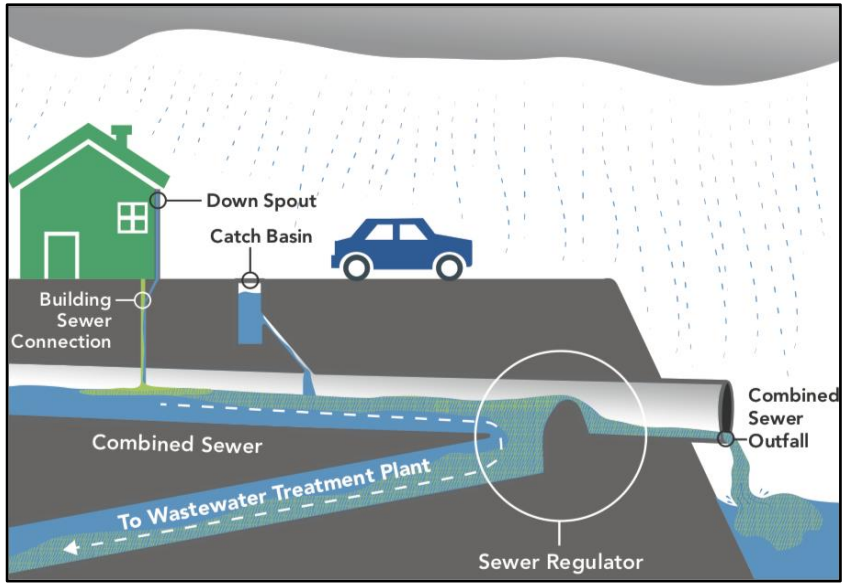
Reducing CSOs Tool: **Sewer Separation**

- Build separate/ parallel pipe networks
- Removes stormwater from combined system into a separate pipe
- All stormwater discharges directly to river

Combined System

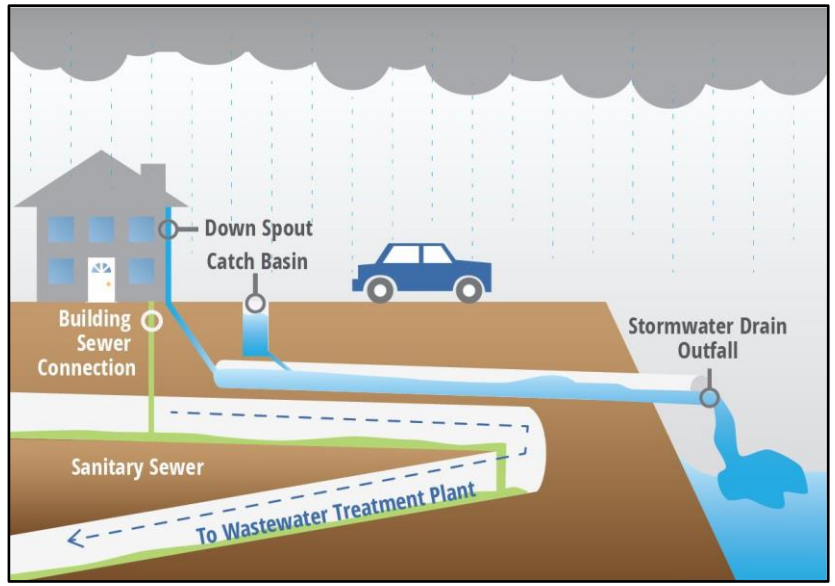


No or Moderate Rain



Heavy Rain

Separate System



Any Rain

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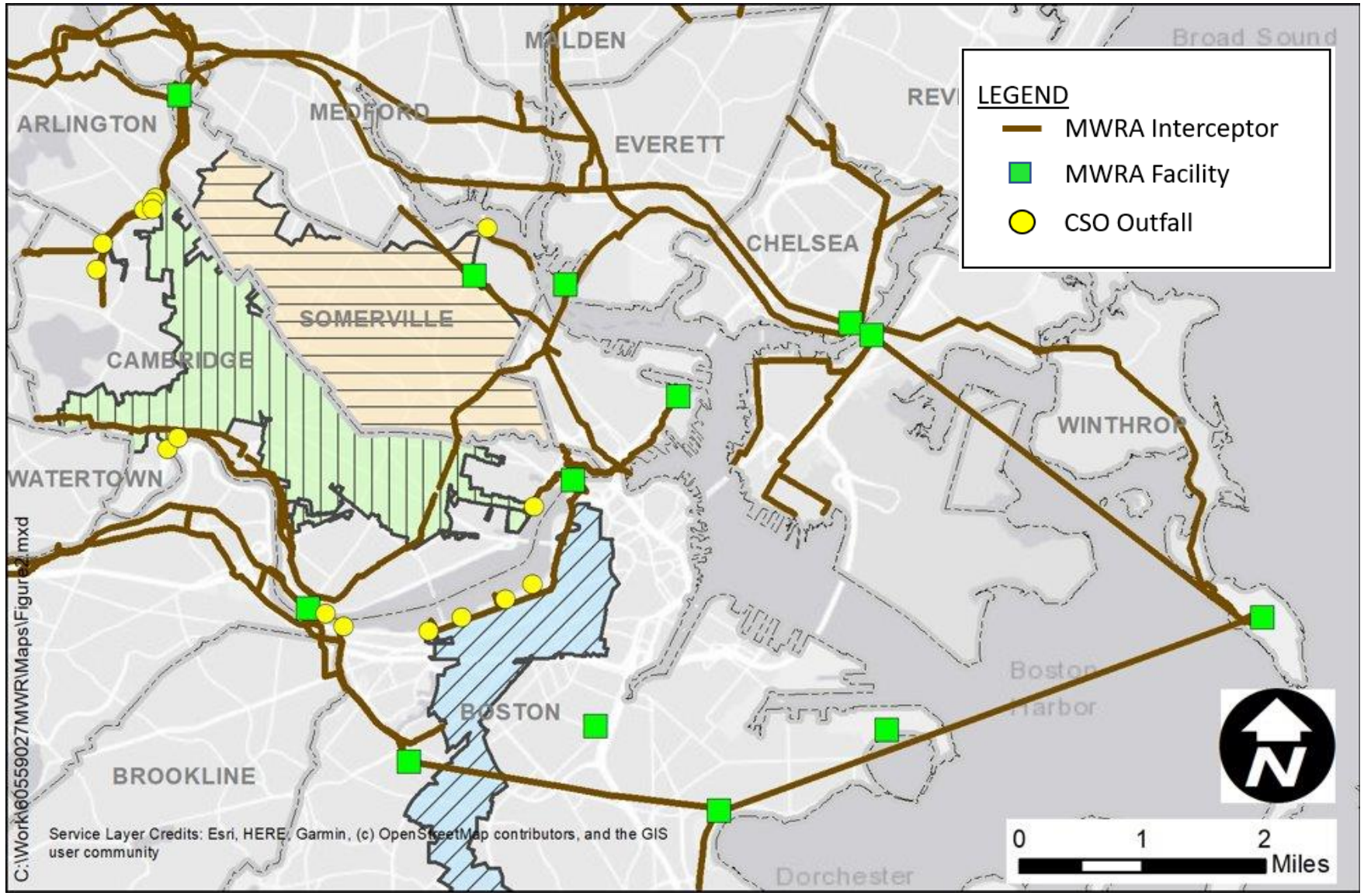
Reducing CSOs Tool: **Sewer Separation**

Combined areas in Cambridge, Somerville, and Boston



Areas to separate stormwater and route to waterways:

- 2,600 acres in Cambridge
- 2,100 acres in Somerville
- 1,200 acres in Boston

When discharging more stormwater, we must consider:

- Stormwater quality
- Stormwater quantity

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Reducing CSOs Tool: **Sewer Separation**

Effective tool to reduce or eliminate CSOs

Renews pipe infrastructure

Increases untreated stormwater to river

- Degrades water quality
- Increases flooding

Construction impacts

- Street by street construction in neighborhoods
- Noise
- Traffic
- Parking

Reducing CSOs Tool:
Green Stormwater Infrastructure

Stormwater Bumpout on Somerville Ave, Somerville
(200 sf footprint, 250 cf storage)

- Collects some of the stormwater runoff before it enters the pipe network system
- Can treat stormwater to reduce pollutants

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Reducing CSOs Tool: **Green Stormwater Infrastructure**

Limited CSO reduction benefits

Adds green space/neighborhood amenity

- Reduced urban heat island

Recharges groundwater

Improves stormwater quality

Constraints to siting in urban areas

- Limited space
- Bike lanes
- Pedestrian spaces
- Mature trees and their roots
- Bus routes

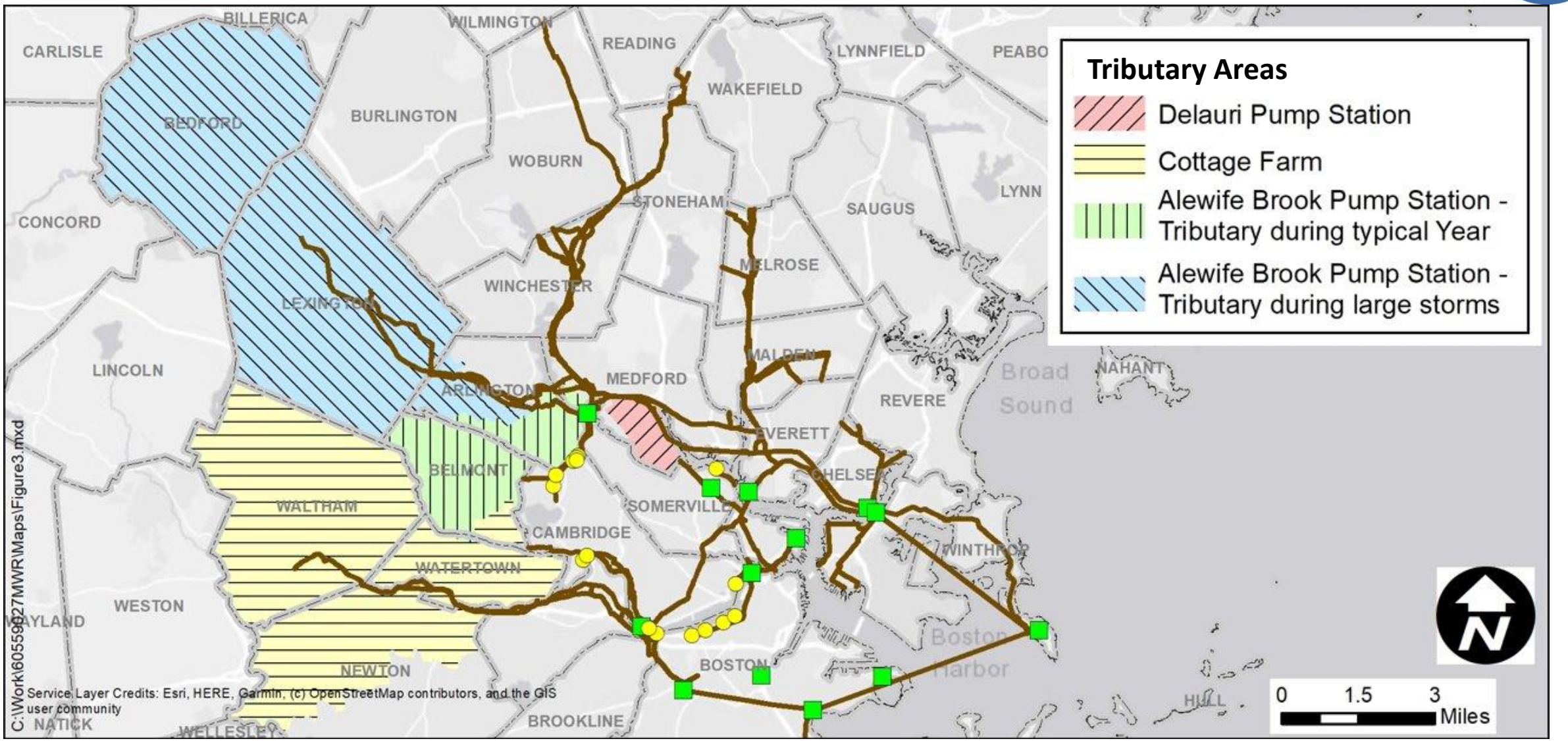
Long term impacts

- Maintenance of installations
- Disruption of parking

Reducing CSOs Tool: **Infiltration/Inflow Reduction**

- Fixing old pipes to reduce groundwater and stormwater entering the pipe network

Reducing CSOs Tool: **Infiltration/Inflow Reduction**



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Reducing CSOs Tool: **Infiltration/Inflow Reduction**

Limited CSO reduction benefits

Renews pipe infrastructure

Construction impacts

- Street by street construction in neighborhoods
- Noise
- Traffic
- Parking

Reducing CSOs Tool: **CSO Storage**

Can hold combined sewer overflows until after the storm by:

- Increasing pipe size
- Building a new storage tank or tunnel

Can release it back to the system for full treatment at Deer Island WWTP.

Union Park CSO Facility Storage Basins: Photo Credit: Simpson Gumpertz & Heger (SGH)
https://www.sgh.com/project/union-park-detention-facility/

Reducing CSOs Tool: **CSO Storage**

Effective tool to reduce CSOs

Limited space in urban areas

Construction impacts

- Noise
- Traffic

Long Term Impacts

- Noise from ventilation and pump back facility

Reducing CSOs Tool: **Conveyance**

Improving the flow through the pipes by:

- Increasing pipe size
- Increasing size of pumps
- Improve pump station operations

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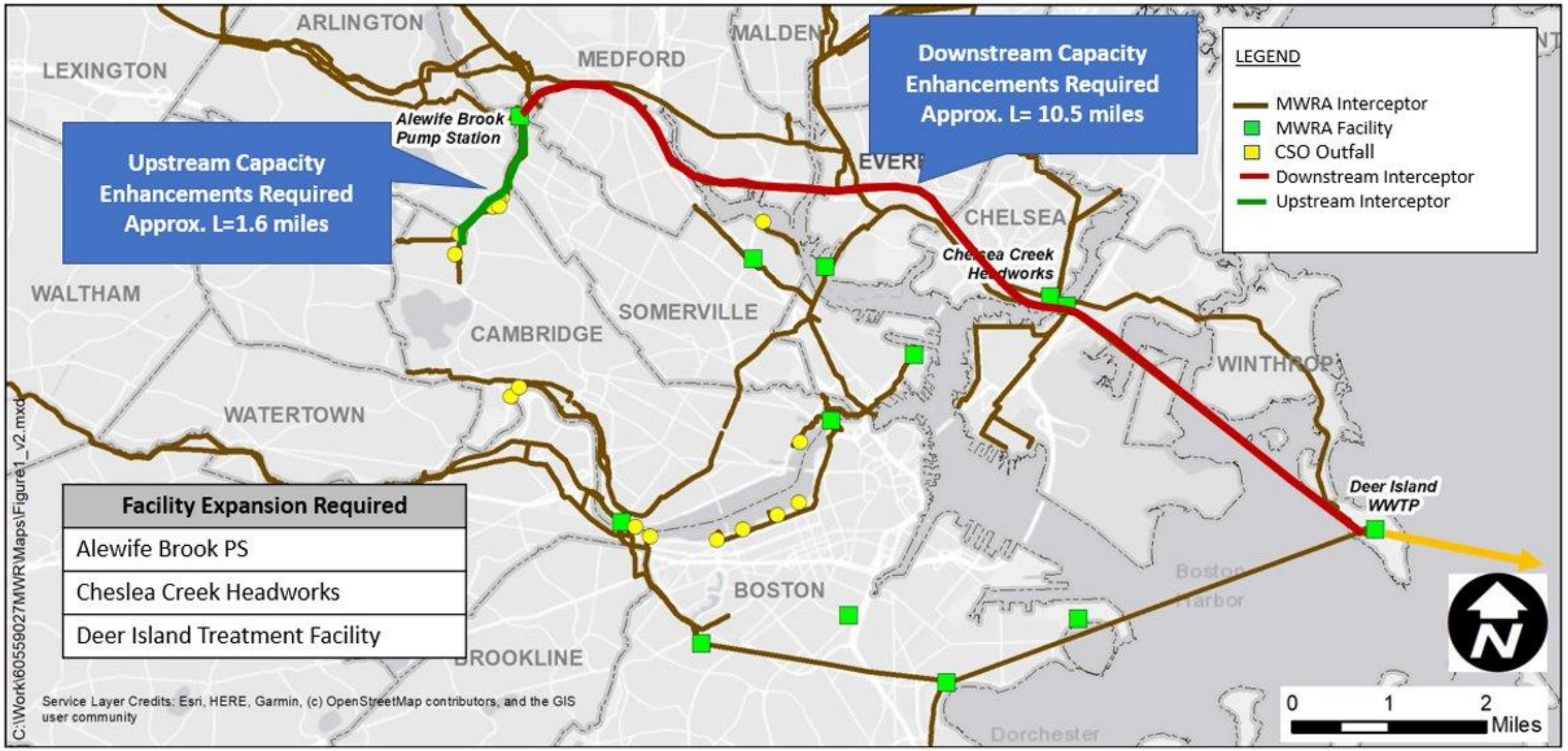
Reducing CSOs Tool: **Conveyance**

Example: Alewife Brook Pump Station (ABPS) Pumping Capacity



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Reducing CSOs Tool: **Conveyance**

- Effective tool to reduce CSOs
- Renews pipe and pump infrastructure
- Requires major pipe and facility upgrades
- Limited space in urban areas
- Construction impacts
  - Noise
  - Traffic

CSO Tools

Reducing CSO volumes

- Sewer Separation
- Green Stormwater Infrastructure
- Inflow/infiltration reduction
- Storage
- Conveyance

Treating CSOs

- Treatment

Treating CSOs Tool: **CSO Treatment**

Treat combined sewer flows before discharging into rivers to remove:

- Trash
- Bacteria
- Sediment
- Other pathogens

Prison Point CSO Facility

Mechanical Bar Screens

Wet Weather Pump

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Treating CSOs Tool: **CSO Treatment**

Effective tool to **treat** CSO discharge

Finding suitable sites can be difficult

Construction impacts

- Noise
- Traffic

Operation Impacts

- Truck traffic
- Chemical deliveries

The Bigger Picture - Goals and Priorities

Community priorities

Steps to developing alternatives

Participant feedback

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Community Values within the Region

- Diversity
- Community character
- Climate citizenship
- Public health and safety
- Innovation
- Creativity
- Accessibility
- Growth
- Sustainability
- Resilience
- Urban ecosystem function
- Natural resources
- Partnership

Updated CSO Control Plans Goals

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Develop, Select, and Evaluate Alternatives

Alternative Development/Selection

Step #1

Creating alternatives by combining tools for each combined sewer outfall

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Alternative Development/Selection

Step #2

Initial selection of alternatives

Alternative Development/Selection

Step #3

Further evaluation & comparison of alternatives

- ☑ Reduce/eliminate combined sewer overflows
- ☑ Reduce flooding and flooding impacts
- ☑ Reduce sanitary sewer overflows
- ☑ Improve water quality
- ☑ Improve our infrastructure (pipes, facilities)
- ☑ Improve resilience of our infrastructure to future climate conditions
- ☑ Improve service to low income and minority communities
- ☑ Offers community co-benefits (e.g., green space, gathering space, heat reduction)
- ☑ Minimize neighborhood disruption
- ☑ Minimize costs to ratepayers / taxpayers
- ☑ **Other criteria based on public feedback**

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We want to hear from you!

Share feedback on the criteria during the meeting at menti.com.

To access the poll either:

1) Go to menti.com and enter code 2670 2429, or
2) Scan the QR code below

What will happen over the next year?

Continue to incorporate feedback from public - survey open from Nov 15th to Dec 31st, 2023 on:

https://voice.somervillema.gov/joint-cso-planning

Create and evaluate alternatives (steps 1 through 3)

Public Meeting #4 – Alternatives Screening and Affordability Analysis

Project Info & Contacts

For additional information on the project, see the project website:

https://voice.somervillema.gov/joint-cso-planning

Or contact

Cambridge: Catherine Woodbury - cwoodbury@cambridgema.gov

Somerville: Lucica Hiller - lhiller@somervillema.gov

MWRA: Jeremy Hall - jeremy.hall@mwra.com

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