

## Trash in Creeks

# Field Investigation Report and Benchmark Research Study

**Andrew Clamann** 

**ZWQC 11//09/22** 



Andrew.Clamann@austintexas.gov
Mateo.Scoggins@austintexas.gov
Leila.Gosselink@austintexas.gov

#### RESOLUTION NO. 20200123-10

WHEREAS, Austin's lokes, rivers, creeks, and springs are a charished natural resource that distinguish Austra and provide immensurable quality of life, localth, enriculous, and converses benefits, and

WHEREAN, the exceptional value the Austra community places on our rivers in reflected in Imagine Austin's Terrimonous and Water priority programs.

WHEREAN trush and other physical contemporary have been accomplished

WHEREAS, in 2018 the Texas Supreme Court found municipal plants bug base to be a violation of state law, officeively eliminating a key City of Austin

WHEREAS, since their introduction to Austin in 2011, electric recommissity devices, such as accorder, have served a valuable rule in providing medical power 22 million relps than far and supporting the COy's transportation result shall good enableshed in the 2019 Austin Strategic Medically.

WHEREAS, the illegal demping of electric minimmethility devices has compounded the environmental finances to our lides and conduct and accounts have

WHEREAS, the Wetershell Protection Department estimates that several handed scotters have been found in Austra materiolys and distingue influentature

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#### covered; and

WHEREAS, the 2015-2006 Watershed Protection Master Plan, Ap. C, Section 5, provides a Watershed Profile on Litter, but these occurs develop

dumping in our water bodies; and

sextures of trash and other physical communicates in Austra's watersheek, and WHEREAS, much and damped electric devices pose a threat to the health

and safety of Austin's river and creek economics and to the residents, visitors, sets, and width?

The City Manager is directed to prepare a study with recommendations increase the ecological health and safety of Austric's trions, takes, and conduct addressing litter problems, prevention, and abstences in our watershelp,

creeks, such as those generated by the Watershed Protection Departm (WPD)  $_{\rm I}$ 

districtes or limitations on the City's ability to precisely access to access of intercentral;

Any remails, recent findings related to later problems or abatement from

#### Figs 2 + f 5

massuance Recovery (ARR) downtown unser sweeps trush collection covariant:

 Best practices implemented by poer cities to provent and above their crecks, rivers, and lakes;

Reconsecutions for actions that WPD, ARR, and other City figurements used take to substantially prevent and abute lines in our untrobods, including programs, regulations, and capital improvement notions.

Estimates of the cost and resource mode to implement each colors, or nell or retential feedbar services, and in colors are consistent or colors.

An update on any of the data actions, or case studies provide Appendix C. Section 5, or the FY 2015-2016 Watershed Protect Master Plan that are not otherwise covered by the topical listed above.

dy, and finding options by February 20, 2020; and include any posttoms which ald be funded with currently approved budget to begin prior to the next flucal or budget cycle.

#### ME IT FURTHER RESOLVED.

The City Manager is described to take immediate action to address the dihazardoon descripting of efective insurroubbility decice, used as societies. Auster's watershools and to revision the residing constructional impacts. The Manager should explore and pursue all practical options, penerially lackading not limited by:

#### Page 3 of 5

- Producing as analysis of the penaltics for damping decirity incommods devices into Analysis eitem, Islam, credits, and springs, Including or flees, and as one history of these defineses, including penaltics changed;
   Coordinating among relevant City departments to resource such damping protected as an illust discharge of pollution under Article 5 (Discharge)
- Quality,
   Creating a new Cky fund, the Save Austin's Rivers Fund, to be use
  inducing the water quality of our from, creates, lakes, and q
  inducing the shapeward of nistrovershills de-love despring and mile
- Developing a public notrouth company regarding the harmful effect microscopility device damping and ways individuals can help, creating a website where neededs can easily optional or otherwise of
- recordings of such dumping offenses with the City if they so choice

  Posting notice of the penalties for this offense in negoted location
- Mentifying additional mechanisms for the prevention of this offer the enforcement of penaltics for this offerse, and for the exhipation environmental durage cause by this offerse.
- The City Manager is encounaged to consider best practices from peer cities

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above. The City Manager shall report back to Council within 90 days on action taken and actions requiring further direction from Council.

### Resolution No. 20200123-108 (CIUR 2234)

#### BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF AUSTIN:

The City Manager is directed to prepare a study with recommendations to improve the ecological health and safety of Austin's rivers, lakes, and creeks by addressing litter problems, prevention, and abatement in our watersheds, to include:

- Current data, historical trends, and maps related to litter in our lakes and creeks, such as those generated by the Watershed Protection Department (WPD);
- Known and likely sources of litter in Austin's watersheds, and current obstacles or limitations on the City's ability to precisely assess these sources for improved litter control;
- Best practices implemented by peer cities to prevent and abate litter in their creeks, rivers, and lakes;
- Recommendations for actions that WPD, ARR, and other City departments could take to substantially prevent and abate litter in our watersheds, including programs, regulations, and capital improvement projects;

## field study

benchmark report





downstream concentration



## Typical pollutant assessment: downstream – upstream = source contribution

This assessment does not work for trash



Variability in storm intensity

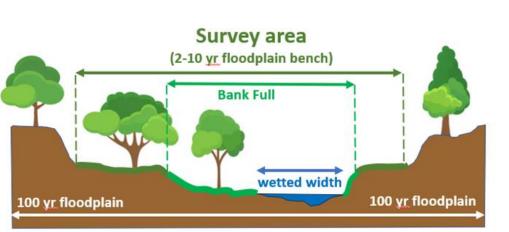


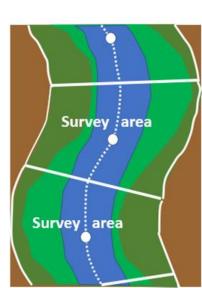


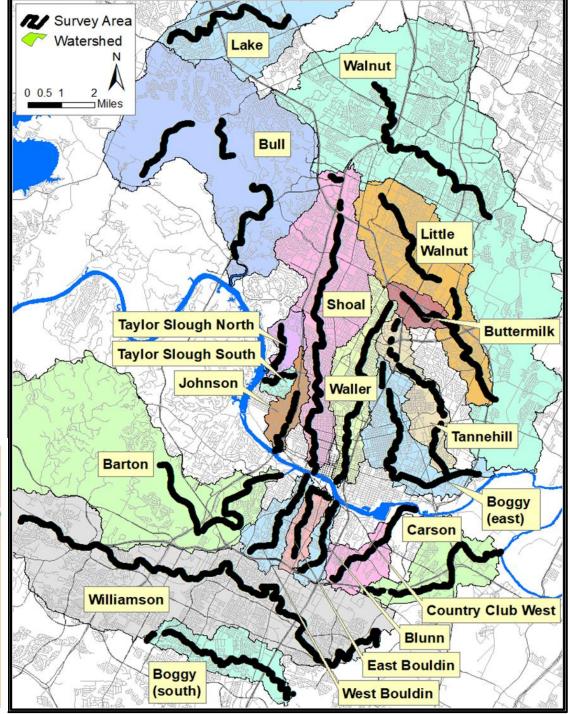
Variability in stream character

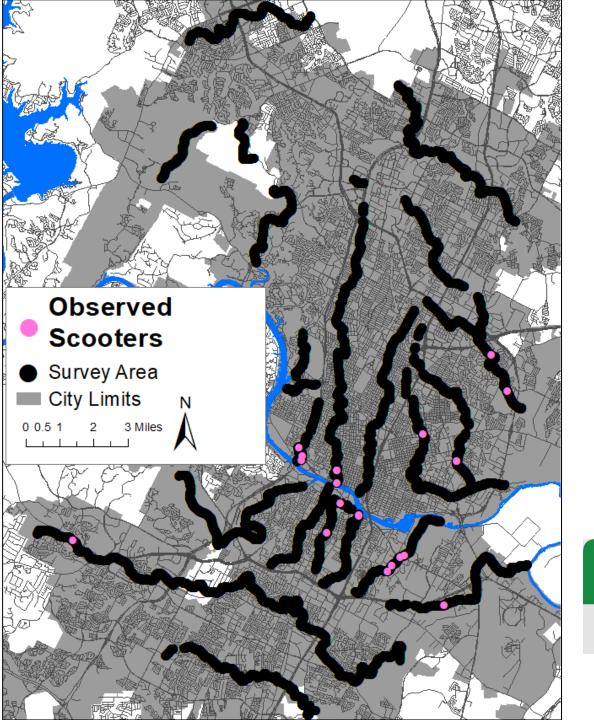
### **Data Collection**

- 20 Creeks
- 110 miles
- Observations every 30ft
- **19,467** data points









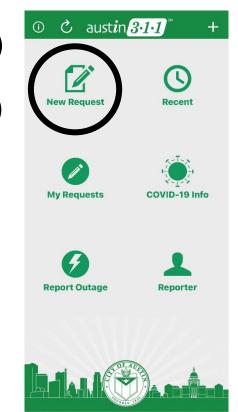
#### **Scooters**

only 21 found



Small number of occurrence due to:

- reduced permitted fleets (since 2020)
- improved process for reporting (311)
- efficient process for removal (vendor)



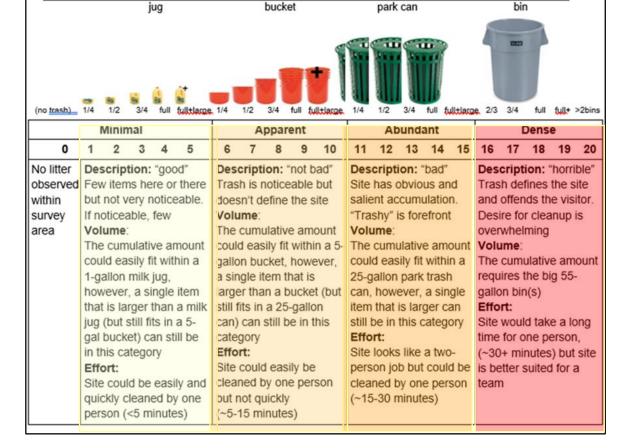
Cancel Choose Service

**SCOOTERS, BIKES & MICROMOBILITY** 

**Shared Micromobility** 

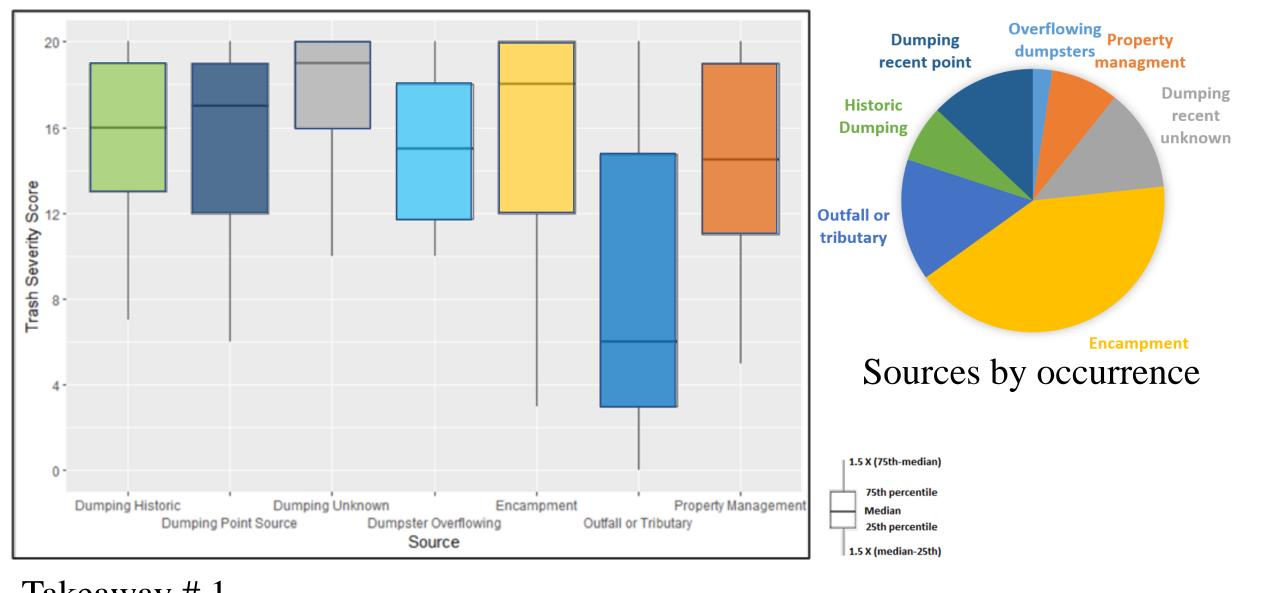
#### Visual Trash Intensity Rubric for Creek Walk

- 1) Score is recorded at the center of a 30ft creek segment (15ft upstream and 15ft downstream of pbint)
- Survey area extends outward to the high bank (perceived floodplain) visible from the channel banks, to include areas that trash will imminently reach the stream in a storm event even if above high bank
- Accumulations of dead vegetation will not be considered trash, however if contained in bags, the bags will be considered trash (presume the bag is separated from leaves). Same with sandbags.
- 4) Immobile abandoned infrastructure (e.g., pipelines in channel, large blocks of concrete) will not be considered trash if infeasible (without heavy equipment) to remove/cleanup by hand), however, portions that could be easily cut off with hand tools (exposed rebar, cables, etc.) and removed will be considered trash. Small construction debris (bricks, cinderblocks, asphalt etc.) that can mobilize during storm events are considered trash. Materials that are in-place but failing are not considered trash (fence sagging, erosion matting dangling, etc.), but can be considered trash if no longer in-place and mobile



# Trash intensity score + source presence

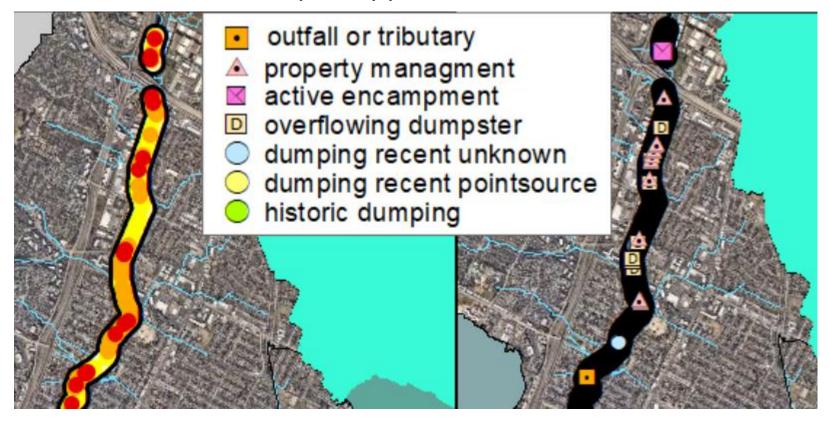
- Overflowing dumpster
- Outfall/tributary
- Encampment
- Dumping historic site
- Dumping point source
- Dumping unknown
- Property management



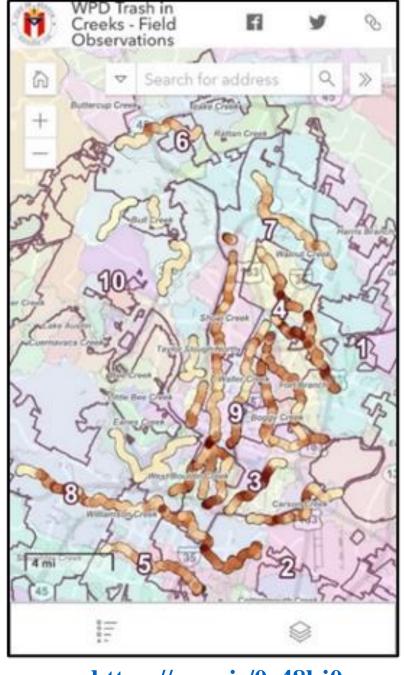
Takeaway # 1
Encampment was the most commonly-observed source,
but is similar in intensity and range to most other sources

# Result: A georeferenced map of intensity\* and sources

example: upper shoal creek

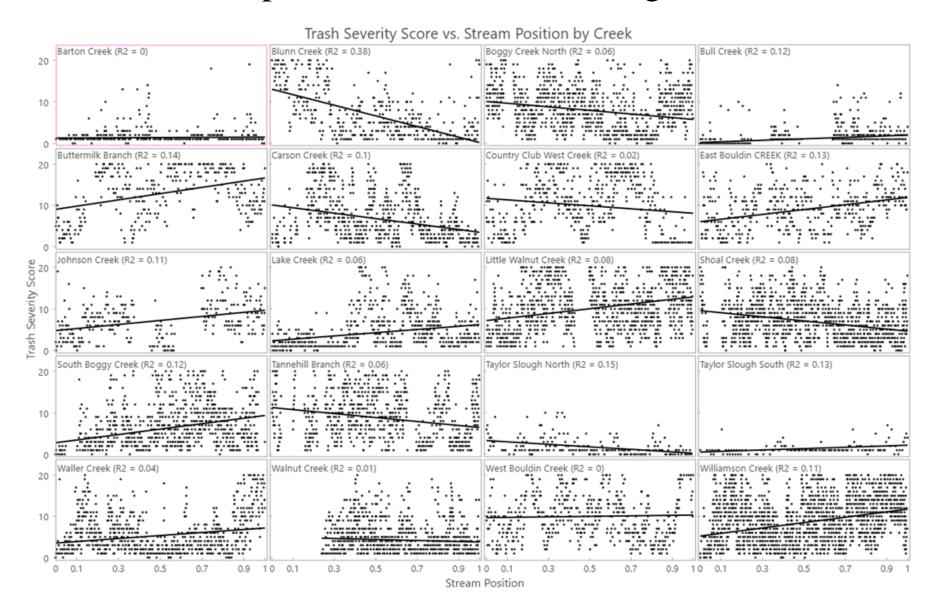


<sup>\*</sup>can be used by internal or external partners for strategic cleaning

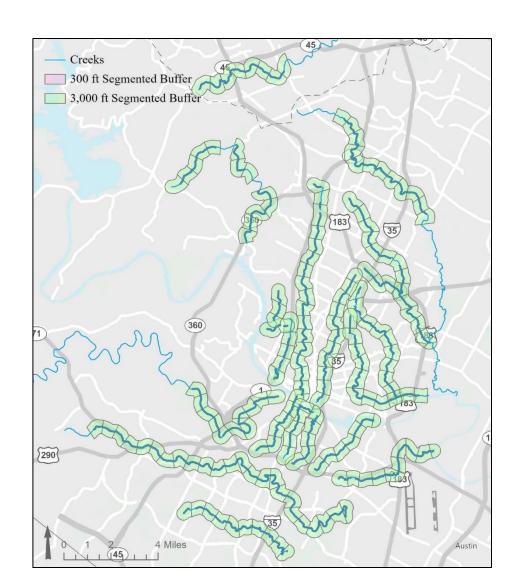


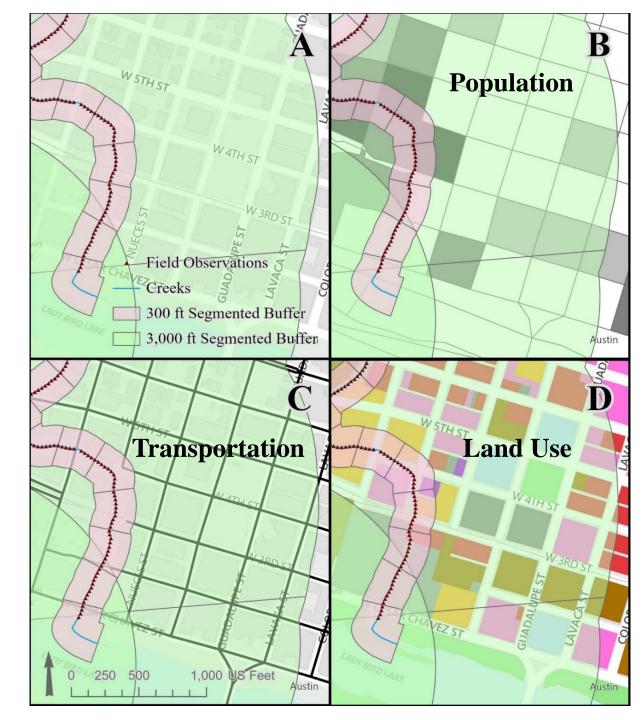
https://arcg.is/0z48bj0

Takeaway # 2 Trash intensity is not proportional to its drainage area (source input locations are deceiving)



# Geospatial analysis using 300' and 3000' buffers

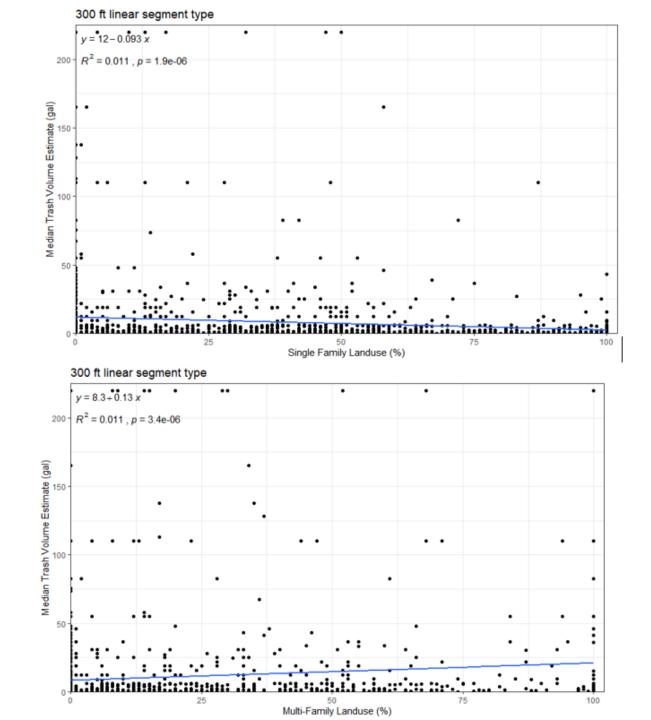




### Takeaway # 3

There were no statistically significant correlations between trash intensity and:

- landuse,
- census,
- transportation,
- parks, etc.



Takeaway # 4

Virtually anything can be found in creeks, but

single use plastics were the most common item

clothing, tents, bedding

recreation items, erosion matting, toys silt fences

packaging, shipping office, household

lawn tools, mulch bags, garden hoses, appliances medical, electronics, textiles, hardware

traffic cones, construction materials, barriers, safety asphalt, lumber

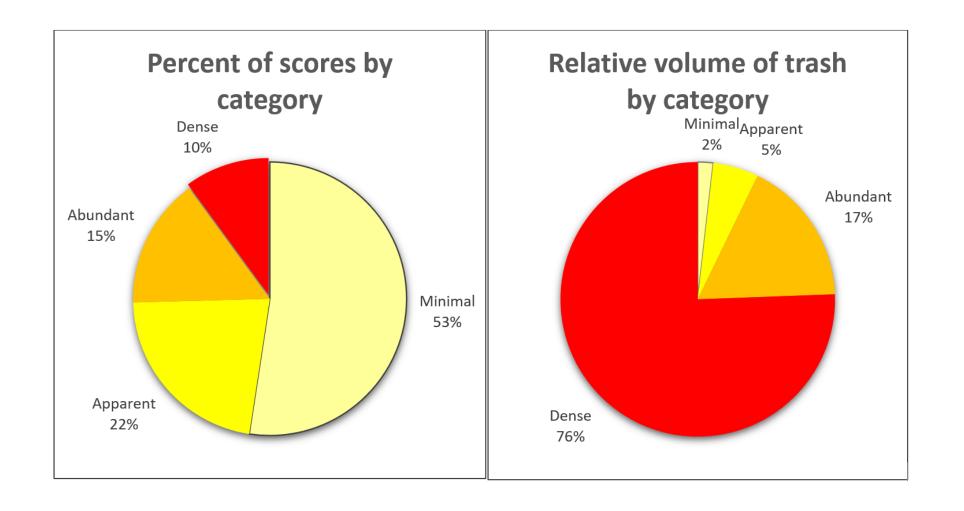
Telecommunication cables, displaced infrastructure

500+ shopping carts



Takeaway # 5

76% of the trash is found in 10% of the area



(opportunity for strategic site selection for cleanups by COA, partners, contractors, volunteers)

# Field report provides diverse assemblage of recommendations at different scales

- site-specific cleanups,
- improved rules for dumpsters,
- structural controls,
- enforcement,
- education/outreach,
- coordination with partners,
- etc

# Benchmarking Research Report

• EXTRACTION (physically removing trash from waterways)

ex: structural controls, machines, manual labor

INTERCEPTION (keeping trash from entering waterways)

ex: education, enforcement, landscape cleanups, structural controls

SOURCE REDUCTION (stemming the flow into our community)

ex: limit single use plastics

# Extraction

- creek and lake cleanups\*
- requirement/enforcement of vendors/individuals to clean up
- targeted cleanups at "hot spots"
- novel devices to concentrate trash and/or ease retrieval

(e.g. booms, trash traps, etc)

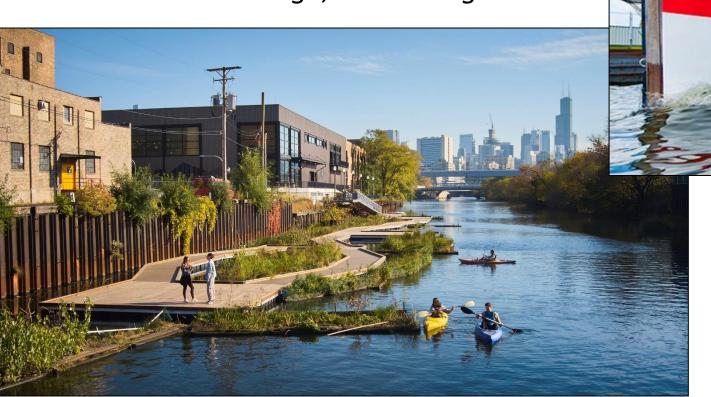


<sup>\*</sup>Partners, contractors, COA staff, ARR "Clean Creeks Crew" staffed and operational this year,

# Examples of highly visible incentivized community participation

# Free kayaks for cleanup commitment

- Urban Rivers Chicago, River Rangers



## Tourist "Trash Fishing"

-Netherlands (photo)

Deze boot is gemaak van Ar grdams Grachtenpl

-Individual boats Troy, MI

# Interception

- Enforcement and facilitated reporting ex: Philadelphia's "Sweep Program" including citations and fines
- Ordinances to reduce incidence and effects of overflowing dumpsters
- Shopping cart on-site retention
- Telecommunications cable removal





# Interception

## Capacity, proximity, accessibility

- Solar compacting bins
- Mesh bags on water (Buffalo River)
- Litter Boat
- Increase waste receptacles at picnic tables
- Free Dump Days
- Continue/increase services at encampments

## Evaluate street sweeping Evaluate drainage system controls

- Curb inlet guards with street sweeping or Adopt-A-Drain
- WQ/Detention ponds retention/removal of floatables





## Source Reduction

Education and outreach

Solicit voluntary partnership/cooperation with businesses

• example: HEB leadership during/after the bag ban

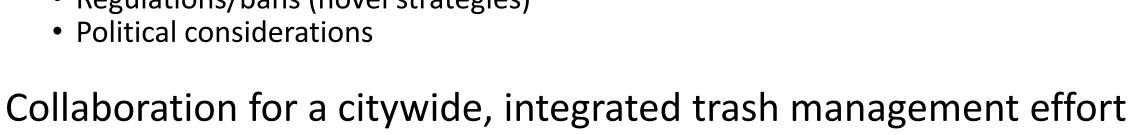
Water stations to reduce dependance on bottles

#### Restriction/requirements

- glass/Styrofoam restriction/requirements in city-owned properties
- education/check-point at entry and launch points providing mesh bags and limiting Styrofoam coolers & glass (example: San Marcos)

Campaigns or strategies to reduce use of single-use plastics and Styrofoam

Regulations/bans (novel strategies)





New Braunfels Can Ban

#### **Bottom Line**

Trash in creeks is a result of the entire community; there is no "one source" primarily to blame

COA and Partners are actively engaged in the solution; there is room for improvement and innovation

## **Next Steps**

COA is working to improve efficiency and effectiveness of programs to extract, intercept, and reduce trash

The results and recommendations from reports can inform site selection and strategies to address trash in creeks

# **Appreciation**

#### Benchmark research

Leila Gosselink

### Design, fieldwork and report

- Mateo Scoggins
- Jeremy Walker-Lee
- Ryan Burke
- Lauren Parrish
- Todd Jackson
- Brent Bellinger

#### Data management and analysis

- Rob Clayton
- James Collins
- William Burdick
- Abel Porras
- Ed Peacock

#### **Partners**

**Austin Resource Recovery** 

**PARD** 

**WPD Field Operations** 

Keep Austin Beautiful

The Other Ones Foundation

**Austin Parks Foundation** 

**Contractors and Volunteers** 

