



Trash in Creeks

Field Investigation Report and Benchmark Research Study

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City Council Work Session 9/27/2022



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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

RESOLUTION NO. 20200123-108

WHEREAS, Austin's lakes, rivers, creeks, and springs are a cherished natural resource that distinguish Austin and provide immeasurable quality of life, health, ecological, and economic benefits; and

WHEREAS, the exceptional value the Austin community places on our rivers is reflected in longtime Austin's Environment and Water priority programs; and

WHEREAS, trash and other physical contaminants have been accumulating in Austin's rivers and creeks, where they can linger for years; and

WHEREAS, in 2018 the Texas Supreme Court found municipal plastic bag bans to be a violation of state law, effectively eliminating a key City of Austin regulation to reduce litter in our watersheds; and

WHEREAS, since their introduction to Austin in 2015, electric accessibility devices, such as scooters, have served a valuable role in providing mobility options, providing over 12 million rides that are and supporting the City's transportation mode shift goals established in the 2019 Austin Strategic Mobility Plan; and

WHEREAS, the illegal dumping of electric accessibility devices has compromised the environmental health of our lakes and creeks, and scooters have been found in significant numbers in water bodies in cities around the nation; and

WHEREAS, the Watershed Protection Department estimates that several hundred scooters have been found in Austin watersheds and strong information to date, and that hundreds more may be in the watersheds but not yet been found or recovered; and

WHEREAS, the 2019-2020 Watershed Protection Master Plan, Appendix C, Section 5, provides a Watershed Pathway to Litter, but does not address development and the passage of time since an updated and strategic approach to litter and dumping in our water bodies; and

WHEREAS, the City of Austin has not completed a formal study about the sources of trash and other physical contaminants in Austin's watersheds; and

WHEREAS, trash and damaged electric devices pose a threat to the health and safety of Austin's citizens and pets, and pose a threat to the community, visitors, pets, and wildlife; and

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- 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;
- Any trends, current challenges, or other problems or abatement from non-WPD programs that could impact our watersheds, such as Austin's

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Litter Source Inventory (LSI) documents litter sources and provides a trash collection program;

- 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;
- Estimates of the cost and resource needs to implement such of the programs, as well as potential funding sources, such as grants;
- An update to any of the data, actions, or cost studies provided in Appendix C, Section 5, of the FY 2019-2020 Watershed Protection Master Plan that are not otherwise covered by the studies listed above.

The City Manager is directed to update council on scope, findings of the study, and funding options by February 20, 2020, and include any portions which could be funded with currently approved budget to begin prior to the next fiscal year budget cycle.

BE IT FURTHER RESOLVED:

The City Manager is directed to take immediate action to address the illegal, hazardous dumping of electric accessibility devices, such as scooters, into Austin's watersheds and to mitigate the resulting environmental impacts. The City Manager should explore and pursue all practical options, potentially including but not limited to:

- Producing an analysis of the penalties for dumping electric accessibility devices into Austin's rivers, lakes, creeks, and springs, including early fines, and case history of those offenses, including penalties charged;
- Coordinating among relevant City departments to ensure such dumping is prosecuted as an illegal discharge of pollution under Article 3 (Discharges into Rivers, Streams or Reservoirs) of City Code Chapter 6-5 (Officer Quirk);
- Creating a new City fund, the Save Austin's Rivers Fund, to be used for improving the water quality of our rivers, creeks, lakes, and springs, including the abatement of accessibility device dumping and mitigating related ecological effects, and dedicating all fines for this offense to the new fund;
- Developing a public outreach campaign regarding the harmful effects of accessibility device dumping and ways individuals can help, and creating a website where residents can easily report or otherwise share recordings of such dumping offenses with the City if they so choose;
- Posting notice of the penalties for this offense in targeted locations of frequent dumping (e.g. bridges over Lake West Lake) and;
- Identifying additional mechanisms for the prevention of this offense, for the enforcement of penalties for this offense, and for the mitigation of the environmental damage caused by this offense.

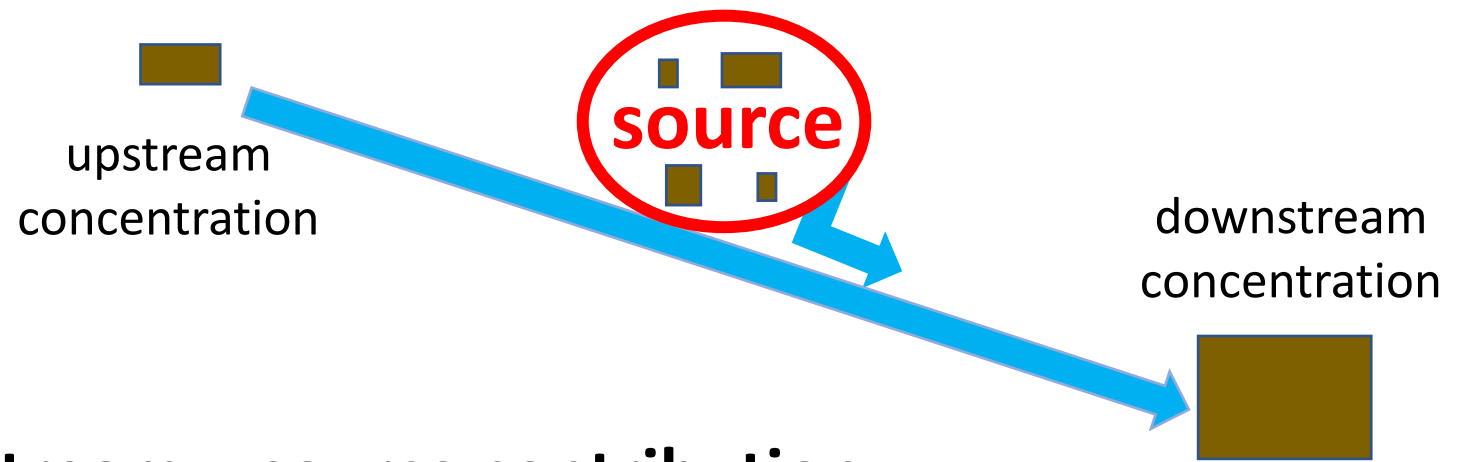
The City Manager is encouraged to consider best practices from peer cities and to collaborate with accessibility companies to pursue the actions listed above. The City Manager shall report back to Council within 90 days on actions taken and actions requiring further direction from Council.

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APPROVED: January 23, 2020 ATTEST: [Signature] City Clerk

Typical pollutant assessment:

downstream – upstream = source contribution



This assessment does not work for trash



Variability in storm intensity

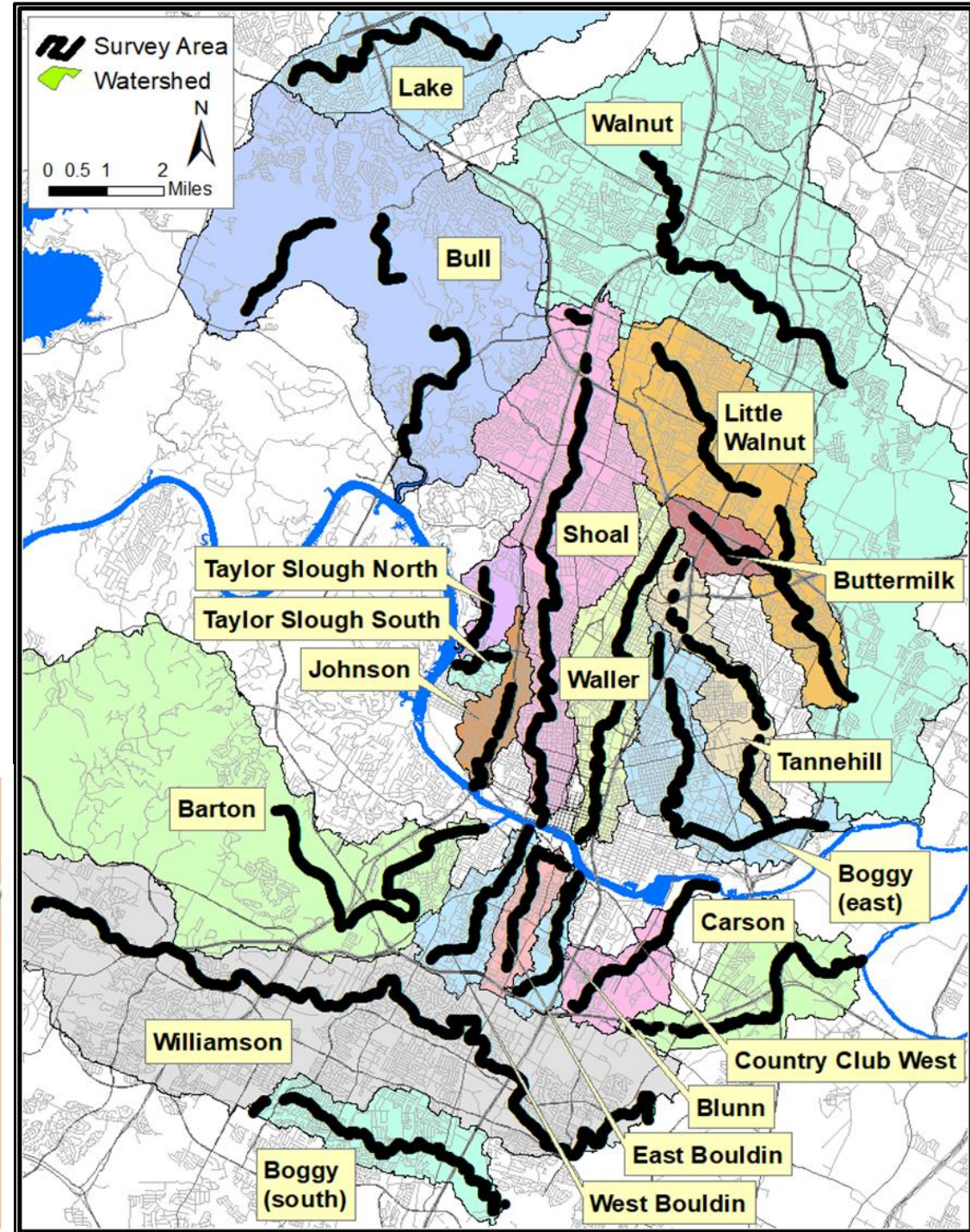
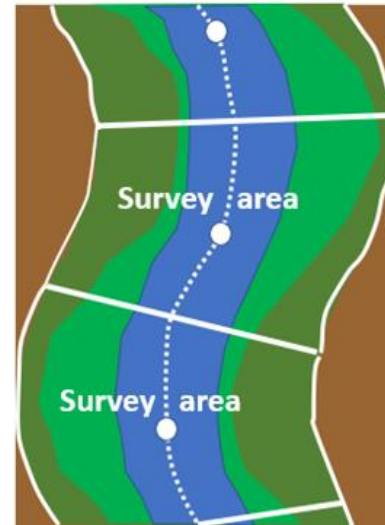
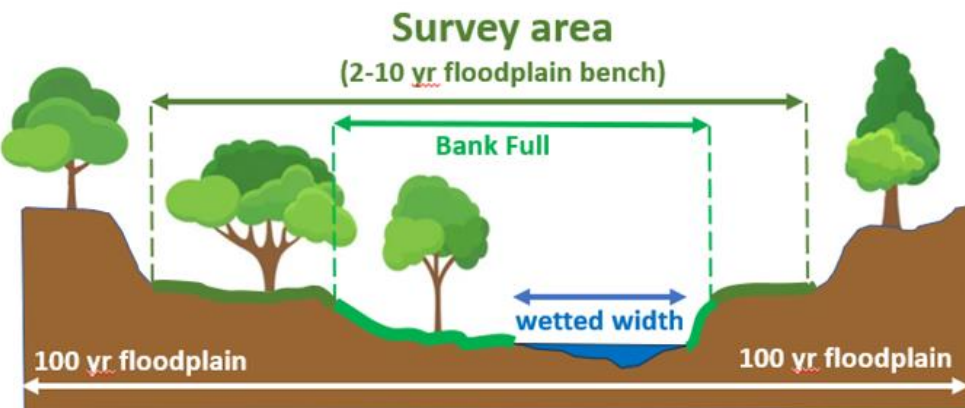


Variability in stream character



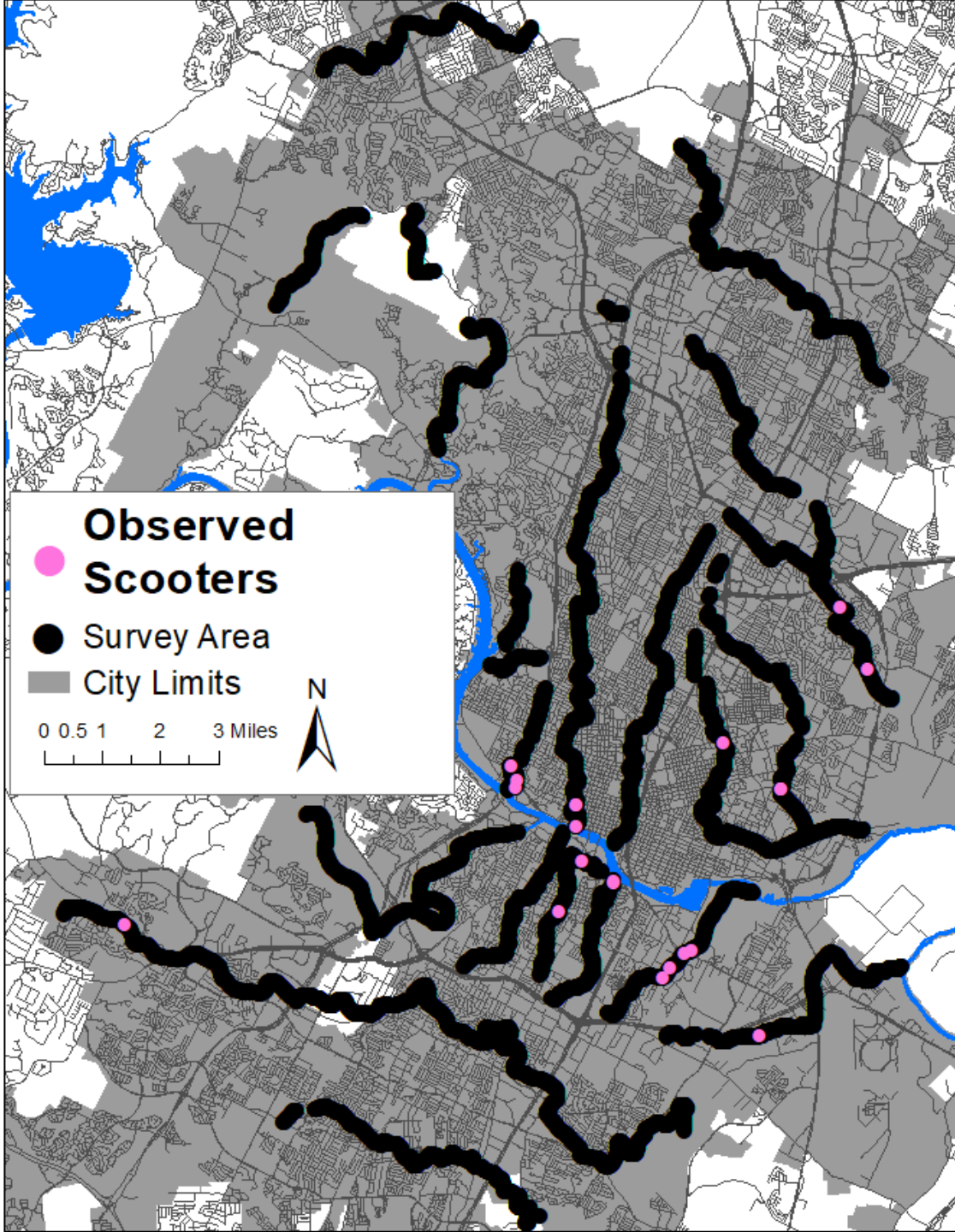
Data Collection

- 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)

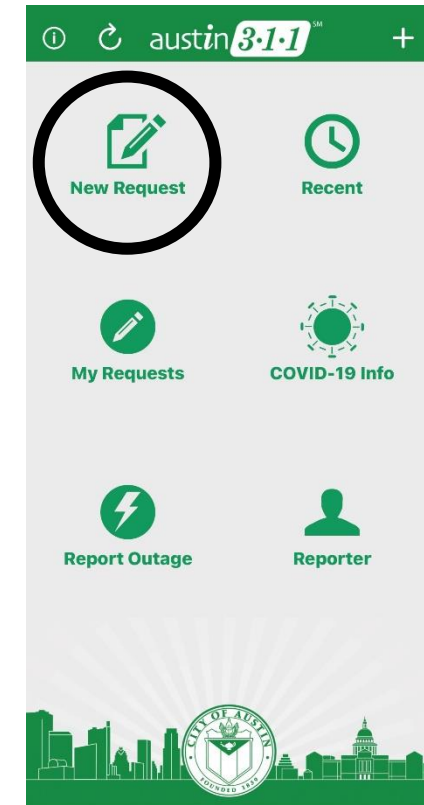
Cancel

Choose Service



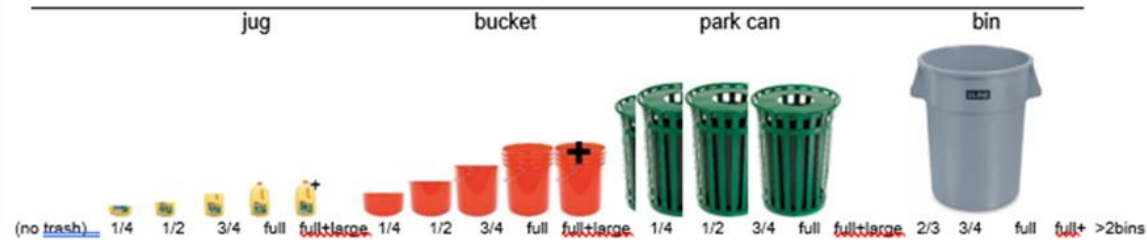
SCOOTERS, BIKES & MICROMOBILITY

Shared Micromobility



Visual Trash Intensity Rubric for Creek Walk

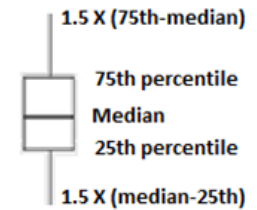
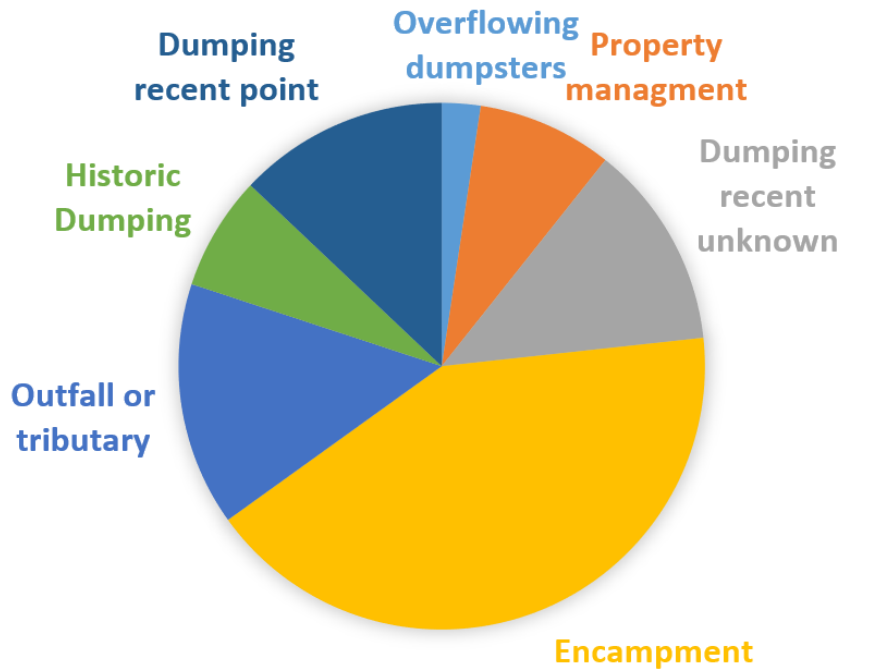
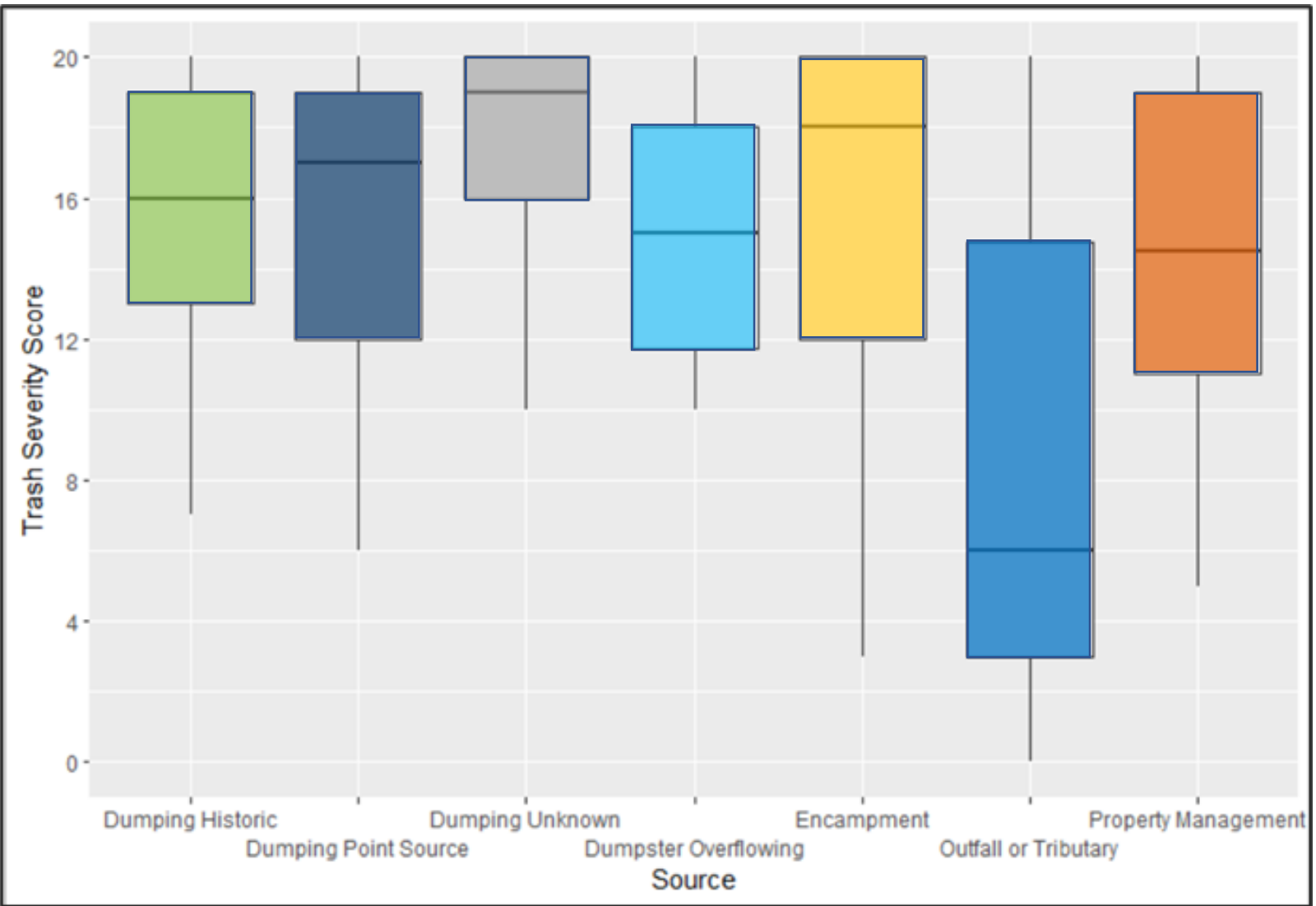
- 1) Score is recorded at the center of a 30ft creek segment (15ft upstream and 15ft downstream of point)
- 2) Survey area extends outward to the high bank (perceived floodplain) visible from the channel banks, to include areas that trash will imminently reach the stream in a storm event even if above high bank
- 3) 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



	Minimal					Apparent					Abundant					Dense				
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
No litter observed within survey area	Description: "good" Few items here or there but not very noticeable. If noticeable, few Volume: The cumulative amount could easily fit within a 1-gallon milk jug, however, a single item that is larger than a milk jug (but still fits in a 5-gal bucket) can still be in this category Effort: Site could be easily and quickly cleaned by one person (<5 minutes)					Description: "not bad" Trash is noticeable but doesn't define the site Volume: The cumulative amount could easily fit within a 5-gallon bucket, however, a single item that is larger than a bucket (but still fits in a 25-gallon can) can still be in this category Effort: Site could easily be cleaned by one person but not quickly (~5-15 minutes)					Description: "bad" Site has obvious and salient accumulation. "Trashy" is forefront Volume: The cumulative amount could easily fit within a 25-gallon park trash can, however, a single item that is larger can still be in this category Effort: Site looks like a two-person job but could be cleaned by one person (~15-30 minutes)					Description: "horrible" Trash defines the site and offends the visitor. Desire for cleanup is overwhelming Volume: The cumulative amount requires the big 55-gallon bin(s) Effort: Site would take a long time for one person, (~30+ minutes) but site is better suited for a team				

Trash intensity score + source presence

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

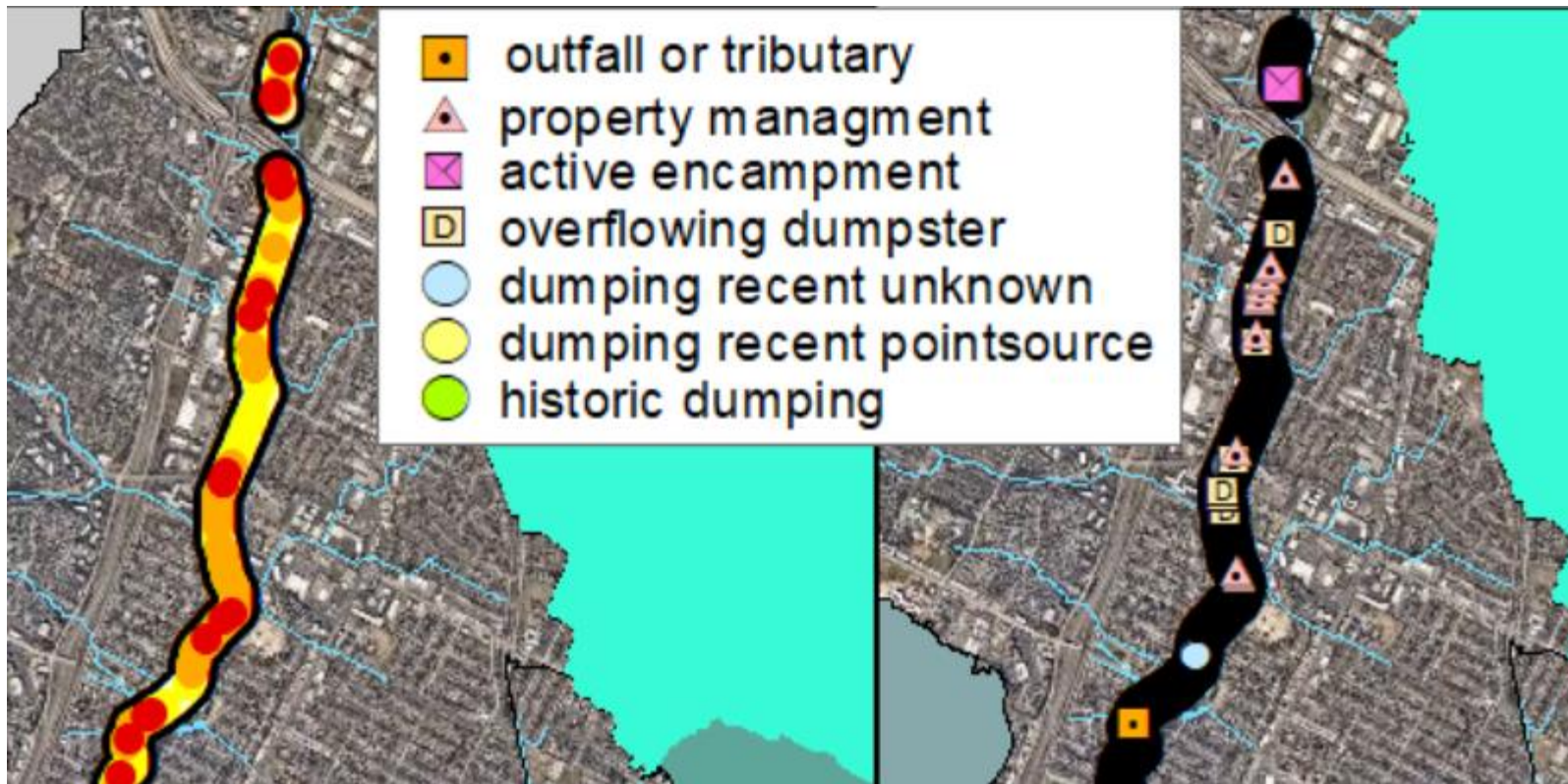


Takeaway # 1

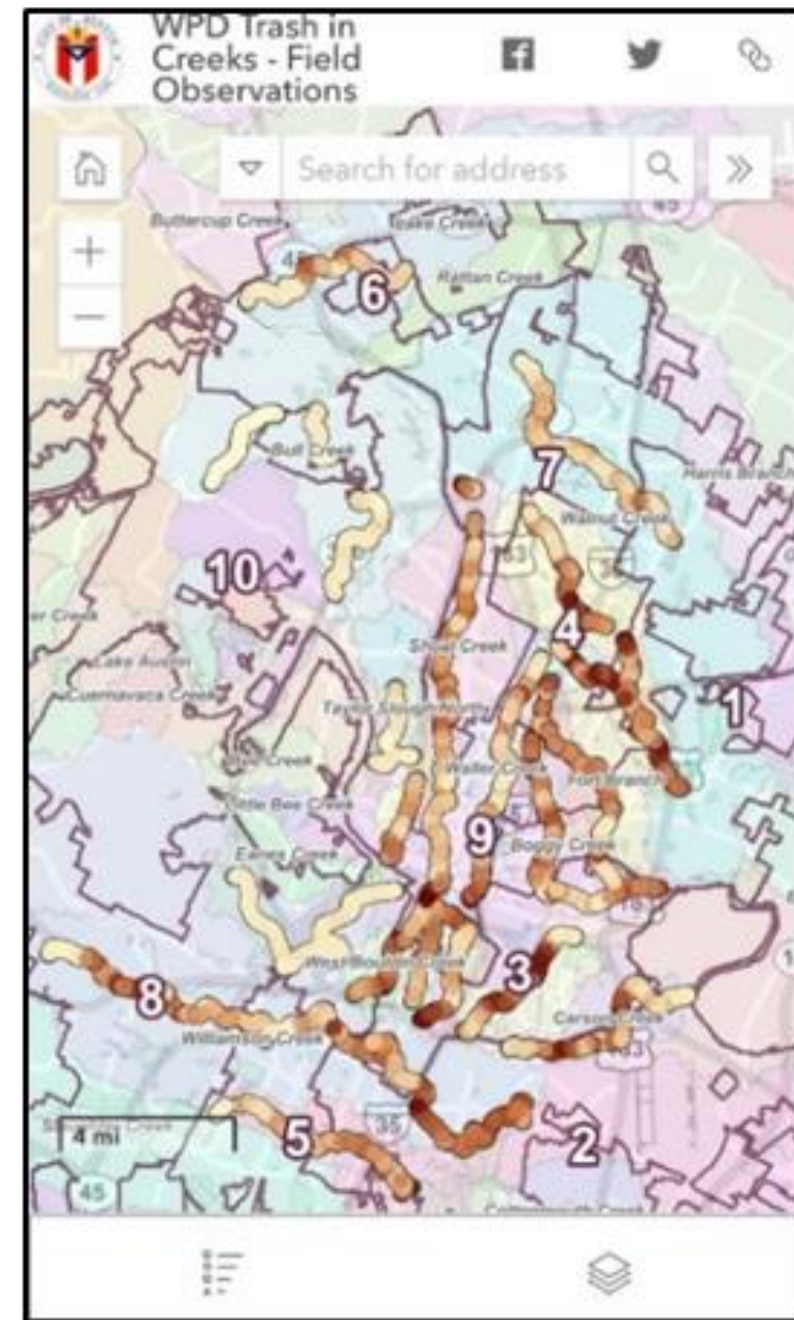
Encampment was the most commonly-observed source, but is similar in intensity and range to most other sources

Result: A georeferenced map of intensity* and sources

example: upper shoal creek

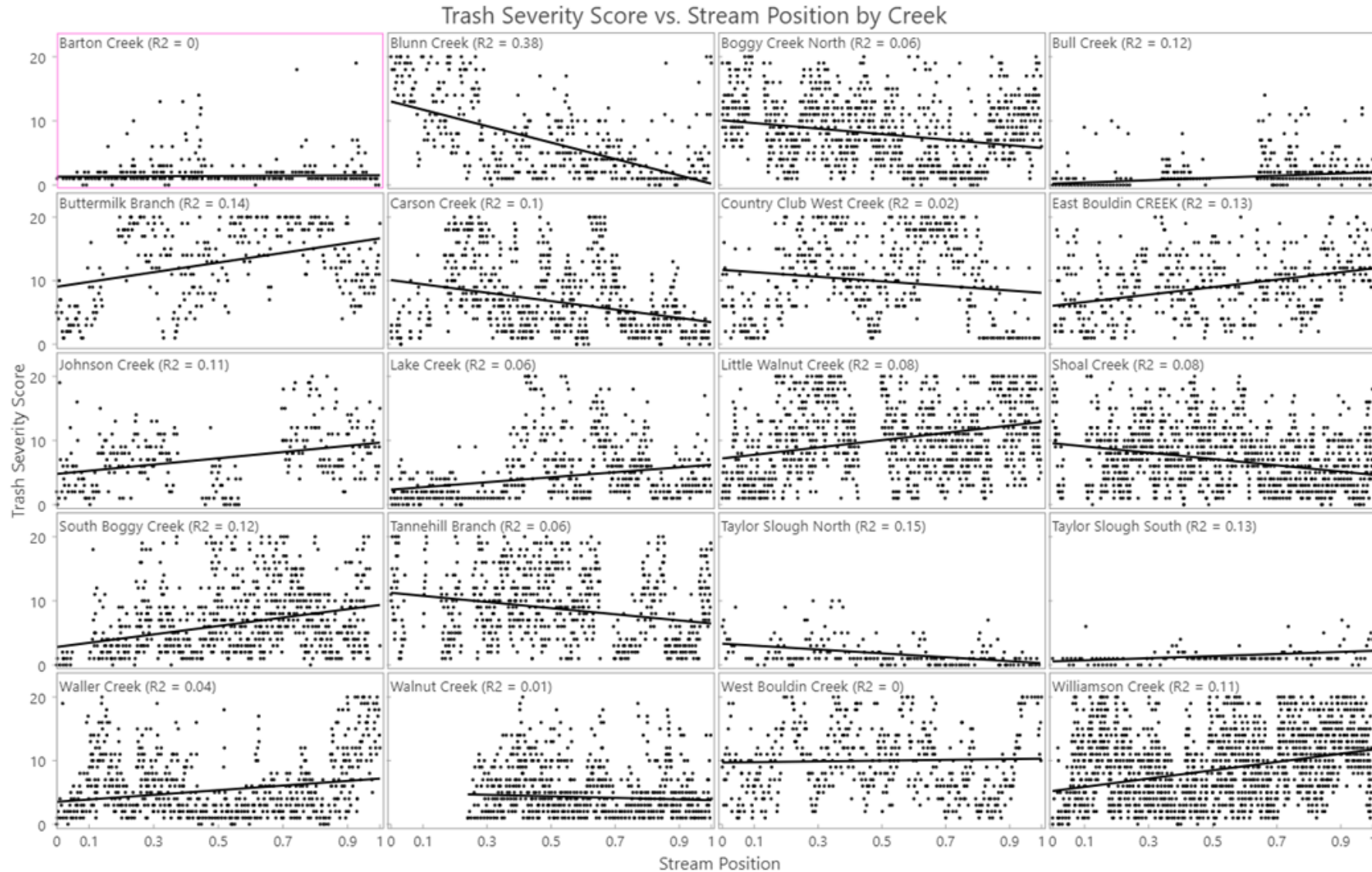


*can be used by internal or external partners for strategic cleaning

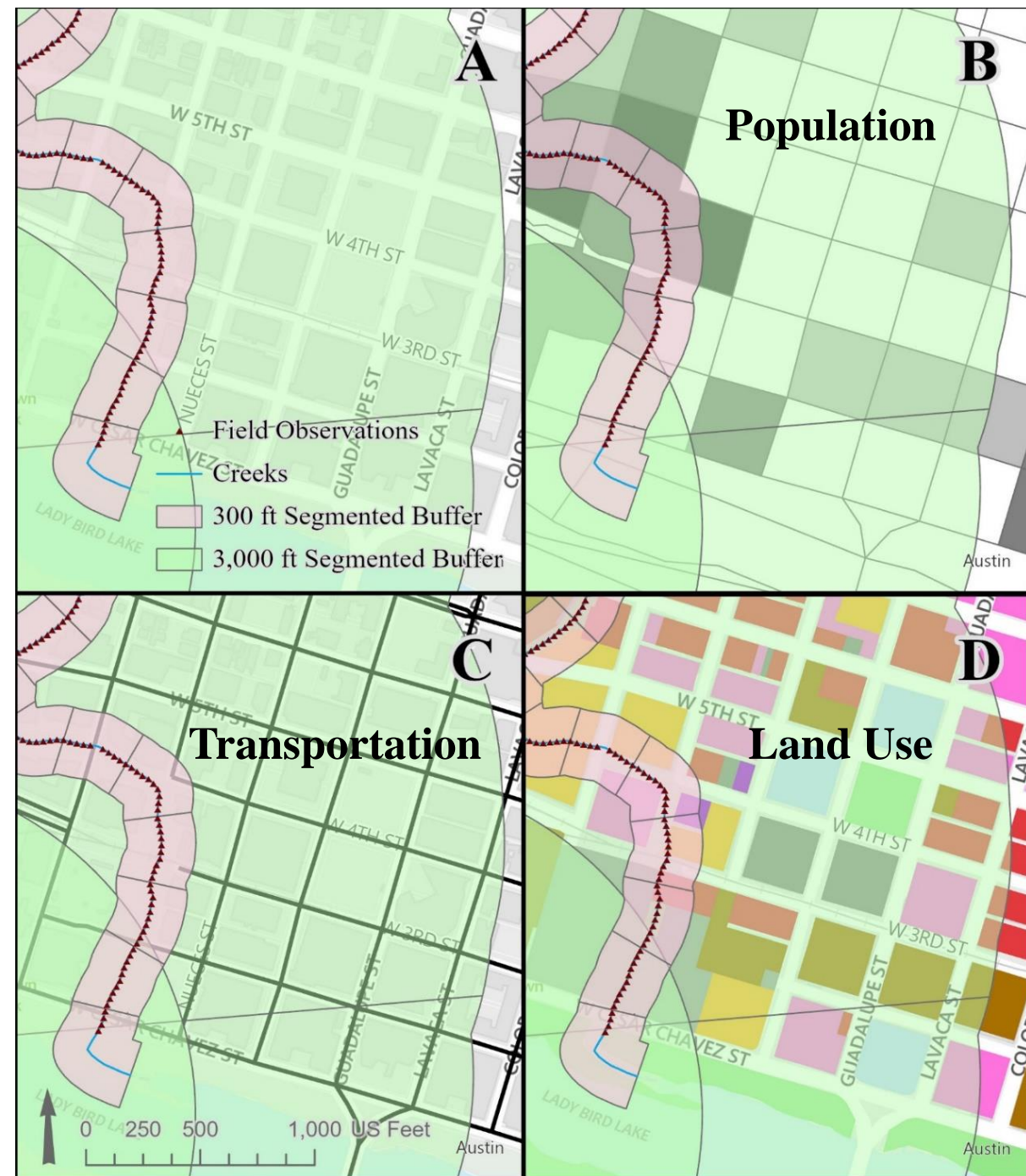
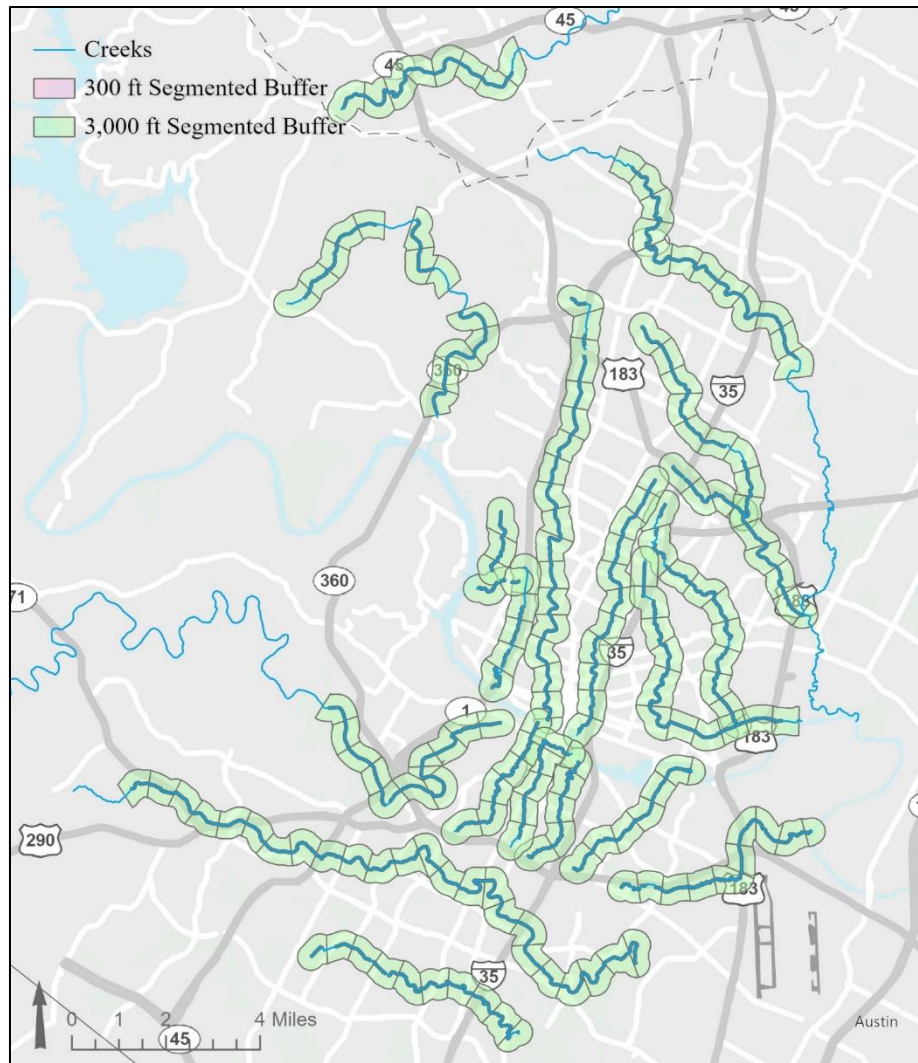


<https://arcg.is/0z48bj0>

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



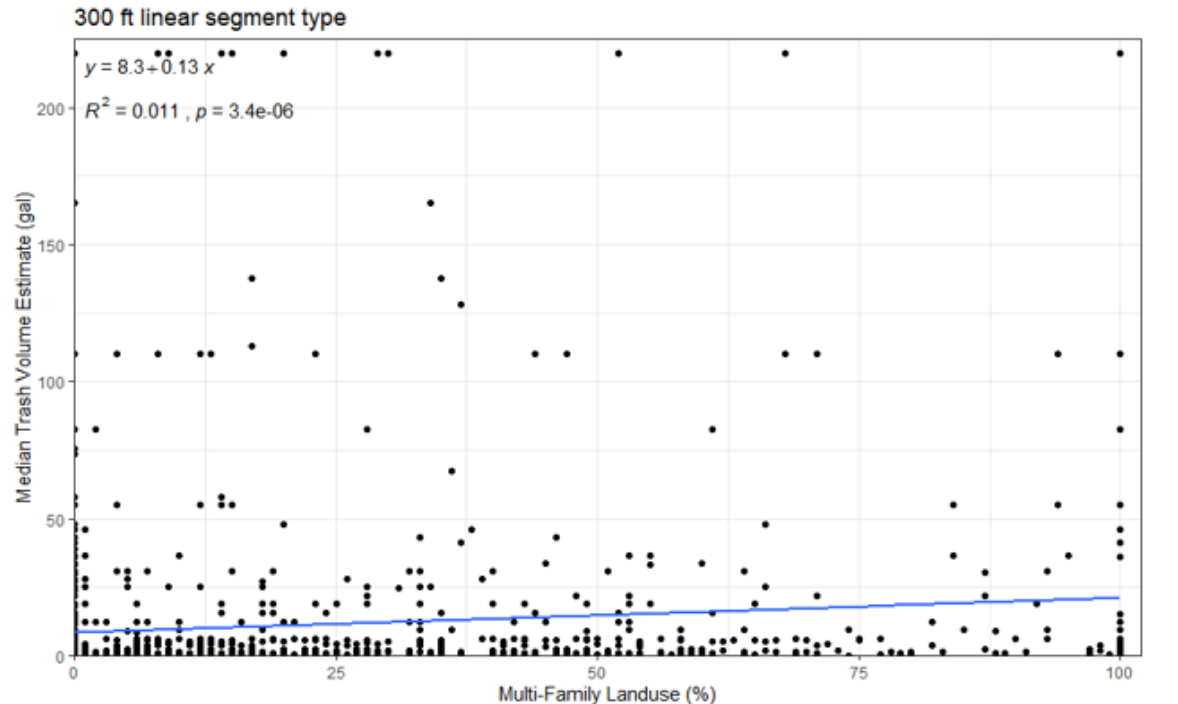
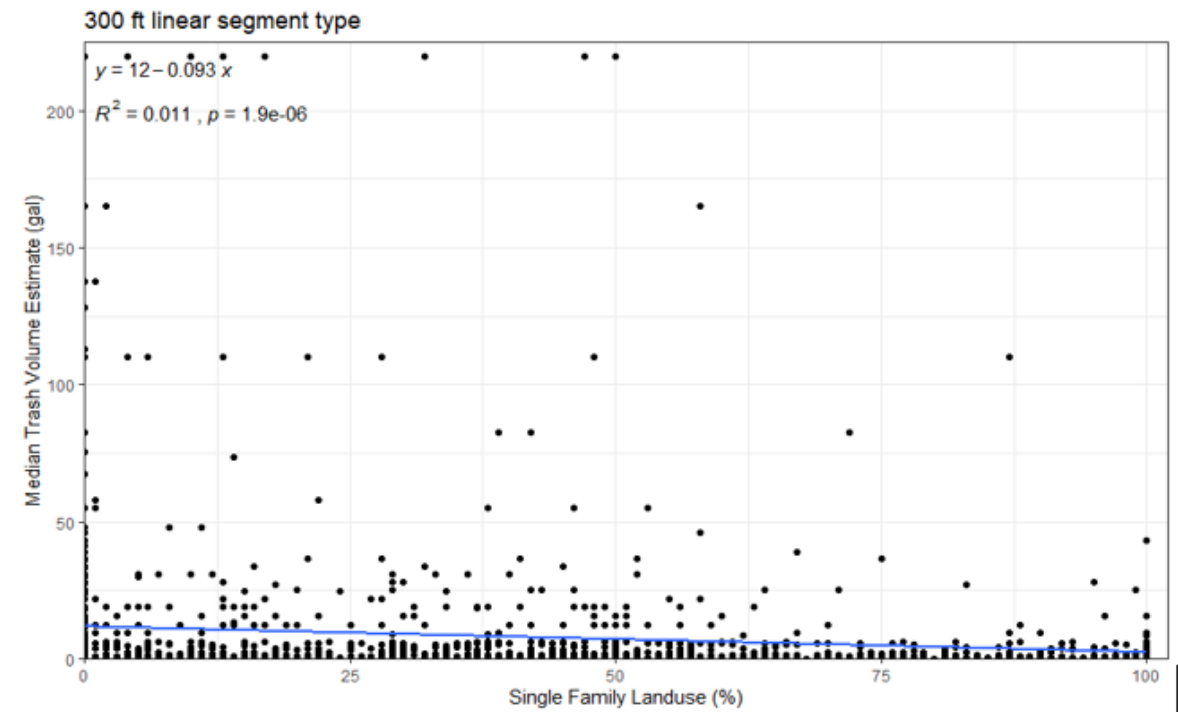
Geospatial analysis using 300' and 3000' buffers



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,
toys

erosion matting,
silt fences

packaging, shipping

office, household

lawn tools, mulch bags,
garden hoses, appliances

medical, electronics,
textiles, hardware

traffic cones,
barriers, safety

construction materials,
asphalt, lumber

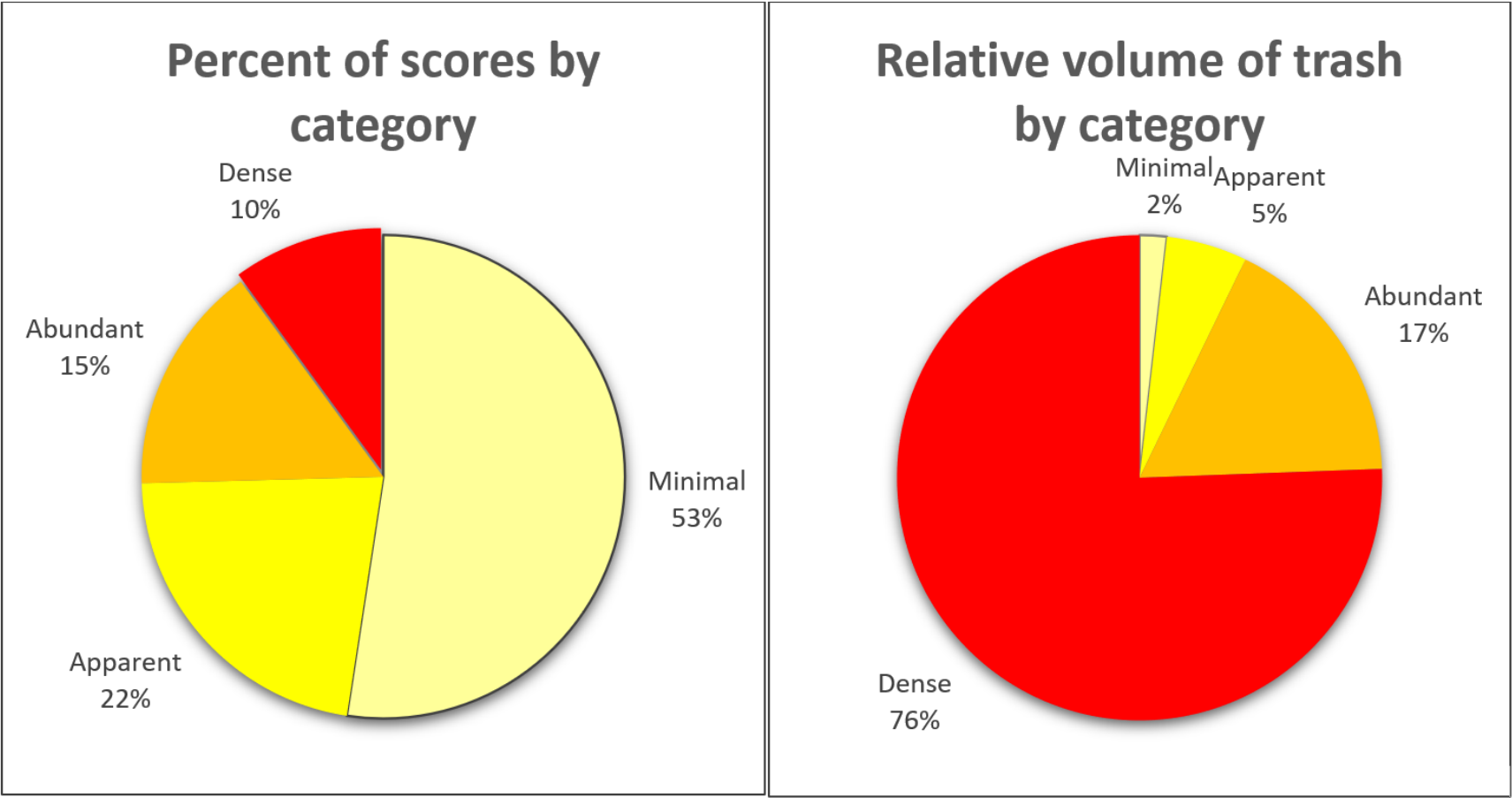
Telecommunication cables,
displaced infrastructure

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

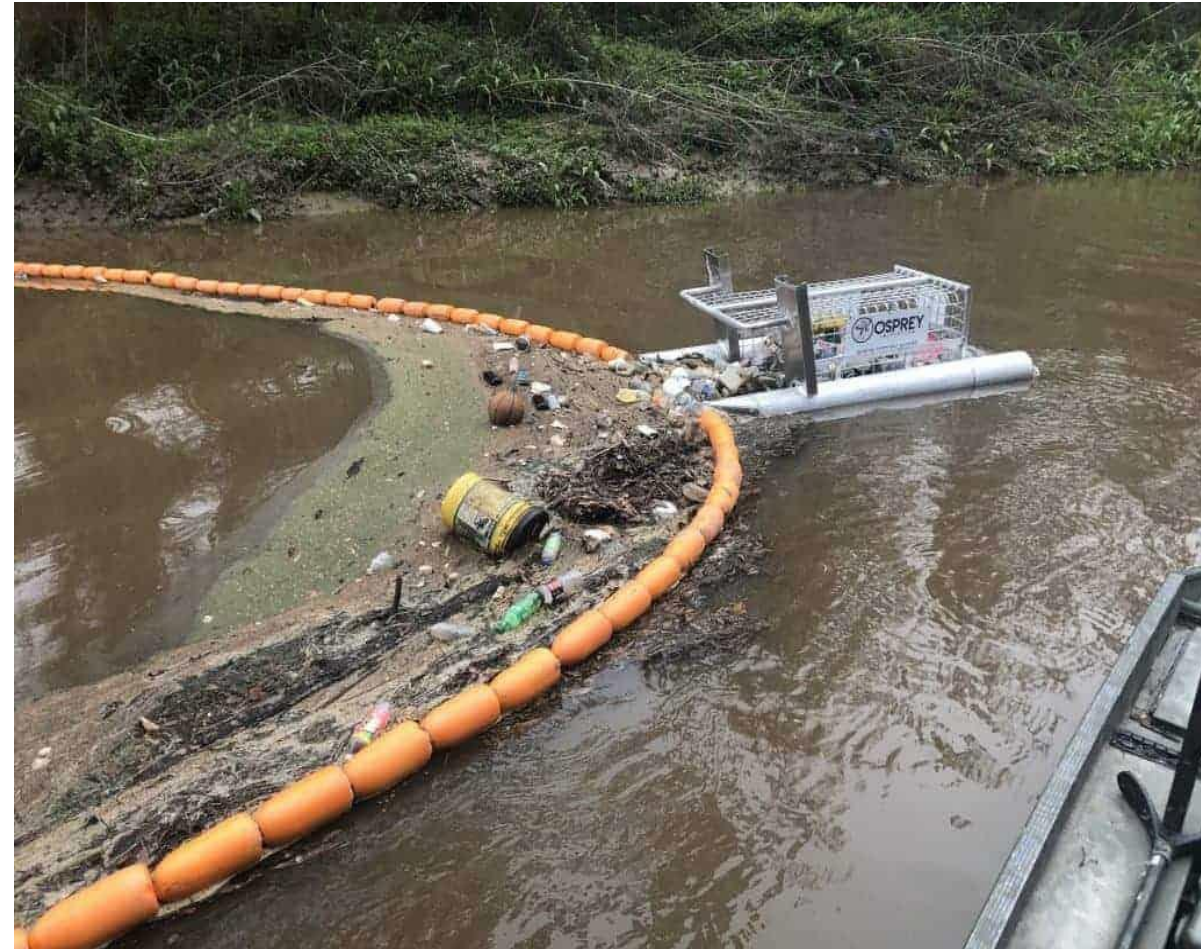
- **SOURCE REDUCTION** (stemming the flow into our community)

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)



*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)

-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)
- Political considerations

Collaboration for a citywide, integrated trash management effort



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
PARC

WPD Field Operations

Keep Austin Beautiful

The Other Ones Foundation

Austin Parks Foundation

Contractors and Volunteers

Questions?

