To: CONNECT Recycling Working Group

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RE: CONNECT Recycling Solutions

Background:

Key Terms:

CONNECT- The Congress of Neighboring Communities, works with the City of Pittsburgh and surrounding municipalities to create solutions to common issues in the region. There are currently 45 municipal members[i].

Materials Recovery Facility (MRF) – recycling plant that receives, separates and prepares recyclable materials for marketing to end-user manufacturers. There are six total in Allegheny County[ii].

Contamination- Occurs when objects enter the stream of recycling that are not meant to be recycled. This can be food, trash, or even other recyclables if they are improperly sorted.

Contamination Rate- measured in percentage, US average contamination rate is 25%[iii].

Pennsylvania Resources Council (PRC)- is Pennsylvania's oldest grassroots environmental organization. They work on environmental education, recycling and waste diversion programs.

The Problem:

For the past quarter of a century, the United States has relied on China to buy and process our recycling, but in 2017 China interrupted that market through the introduction of more stringent acceptance policies. Now, many mixed plastics, unsorted mixed paper, textiles, and mixed metals are banned, and materials that are accepted need to have a 99.5% purity rate or higher to be imported. This shift lead to a severe decline of American recycled products to China. Numbers fell from almost $8 billion in exports of plastics, paper, and scrap metal in 2011 to around $2.5 billion in 2018[iv].

Locally, the rate of return for recycling drastically decreased. For many municipalities and recycling companies the costs of properly recycling materials outweighed the benefits. From 2013 to 2018, the CONNECT member municipalities saw a 10% decrease of total average recycling by ton and a 6.7% decrease in average residential recycling by ton[v]. This decrease is troubling in today's heightened environmentally conscious age, and needs addressed at a municipal level.

Act 101 was legislation passed in Pennsylvania in the 1980s to address challenges in the waste management system, mainly recycling. It established several programs to try and divert waste away from landfills, including a program to boost recycling infrastructure across PA. Chapter 15 of Act 101 states that communities must provide a recycling service if their population is between 5,000 and 10,000 and has a density of 300 residents per square mile. Further provisions require residents to recycle certain materials and to give incentives and penalties if done improperly[vi].

While Act 101 has set rules in place to ensure quality of recycling programs, municipalities who are members of CONNECT, have shown a decrease in recycling volume since 2013 as well as high recycling contamination rates. Policies need implemented at the municipal level to ensure positive change. These will need to focus on increasing the volume of recycling as well as decreasing contamination rates.

The Process:

To fully understand how to tackle this problem, it is first important to understand how the recycling process works in the region. Allegheny County is unique in that it is made up of 130 independently operating municipalities 45 of which are members of CONNECT. This poses a challenge while trying to create cohesive solutions. Varying recycling contracts among municipalities creates confusion which can lead to a decline in recycling and a decline in purity. Recycling

contracts vary in terms of who is in charge of pick up (municipality or contracted company?), what sort of service is offered (curbside pick-up or drop off?), and what materials are eligible for pick up.

Once this is waded through and recycling and waste are hauled, the materials are brought to a transfer station. There, they are loaded onto semi-trucks and collected recyclables are transported to the MRF. These facilities sort the materials, taking out anything unusable, and bale them together to go to market. Unusable waste is removed and disposed of in a landfill[vii].

Issues:

- **Single Stream:** the process of putting all recycling in one bin to be collected, often related to higher levels of contamination among MRF outputs. Separation before collection of recyclables is more ideal, but also requires more work and is not currently an ideal switch for many haulers in today's market.
- **Wish-cycling:** a huge problem for MRFs. This term refers to the phenomenon of recycling something that seems recyclable, but in reality, is not. This clogs the machines at the MRF and increases the likelihood of contaminated outputs. The issue is possible to solve through education and advocacy.
- **Glass:** has been phased out in many municipalities' recycling contracts, but not by all. Glass increases contamination of product because it tends to break during the sorting process. It also puts employees at risk[viii]. The varied policies on glass between municipalities can cause confusion among citizens.
- **Plastic Bags:** MRFs sort loose recycling, so anything that arrives bagged must be opened and added to the pile of loose materials. Unfortunately, anything that comes in an opaque bag is automatically disposed of to prevent contamination of materials and to keep workers safe. Clear bags will sometimes be opened as materials are more visible, but not always. Loose recycling is the only way to ensure that materials go through the sorting process[ix].
    - Additionally, low grade plastic bags such as grocery bags are not recyclable. They clog separation machines and time must be taken in between every shift at the MRF to remove any plastic which has snagged on machinery[x].
- **Ban on Bans:** Pennsylvania Governor Tom Wolf signed legislation in June of 2019 officially banning the taxation or ban of plastic bags among other plastic products by municipalities[xi].

Current Solutions:

- **Pop-up Events:** have been coordinated through the PRC to remove glass items from residential recycling. These events were held every Saturday at varying locations and accepted all colors of glass bottles and jars. PRC staff and volunteers were on site to help with sorting and any questions that arose. Events are sponsored by a different municipality each week, costs to sponsor range from $750- $1250 per event. 105 tons of glass from 6,000 participants have been collected since March[xii].
    - The South Hills have hosted similar monthly events since Spring 2019 and varying other events have occurred.
    - Events for other waste such as pharmaceuticals and household chemicals
- **Permanent Glass Collection** sites have also been implemented at locations around the region. These are secure bins that are left at a location and act as self-serve recycling. The container available will cost a municipality around $10,000. Timeline of disposal of contents varies depending on level of participation, but costs an estimated $350 per trip[xiii].
- **Pending State legislation:** may be in the works as sponsorship in senate for a PA bottle bill was announced in June of this year [xiv].

Findings:

- **Finding 1:** There was a decrease in recycling by ton among CONNECT members from 2013 to 2018. An even larger decrease is expected in 2019 as many policies kicked in this year.
    - According to data reported by municipalities to Allegheny County recycling has decreased among current CONNECT members over the past five years. By ton, total recycling has decreased by 10% and residential recycling has decreased 6.7%[xv]. See appendix A.
- **Finding 2:** Act 101 states that there is a responsibility on municipalities to provide quality recycling program, low volume and high contamination rates shows this has not been done.
    - As international markets for recycling have been interrupted, it is up to municipalities to ensure that they focus on increasing recycling quality and volume among their constituencies. Act 101 attempts to assure quality of recycling programs across the state, but a decrease of recycling tonnage and poor contamination rates show that CONNECT communities have come up short.
- **Finding 3:** Across the region there is little to no cohesion or cooperation in recycling contracts. Differing policies can lead to confusion among citizens leading them to recycle less and have a higher contamination rate.
    - The Centre County COG has a very comprehensive recycling program and they boast an extremely low contamination rate. Their Sustainability Planner accredits the results to the strong and consistent message transmitted to citizens as to what materials are eligible to recycle[xvi].
- **Finding 4:** Markets exist for recyclables; Waste Management has found and is currently working with American markets to export their outputs.
    - **Finding 4a:** Recycling markets are becoming much more focused on minimally contaminated wastes
        - In speaking with Waste Management, they noted that they still have plenty of business working with new-found American markets as well as continuing to work with the Chinese[xvii].
        - China has changed the rules about how the market works, they have had several proposals of bans on materials, which incited panic. However, for the most part these have been resolved by the international community and are mainly considered threats. China has, however, been able to crack down on the contamination of imported recyclables, implementing the <.5% contamination rate rule. Unfortunately, as of now our national average of contamination is 25%. To be able to tap into the newly changed market, contamination rates need lowered.
- **Finding 5:** There is no cohesive database which measures recommended information to improve recycling.
    - The survey created at the start of this project turned out 7 results of a possible 45, 2 of which were doubles. Additionally, the data that was collected seemed to show a misunderstanding of the questions asked as they were not always answered in a proper manner.
    - We hypothesize that the information we asked was not easily accessible or common knowledge thus creating these issues, a central data collective would address this issue.
- **Finding 6:** Funding availability through the Recycling Partnership
    - The Recycling Partnership is a national non-profit that works to improve the recycling habits of communities across the United States. Currently, they are working with the City of Pittsburgh and CONNECT has already been in touch and built a rapport with the organization.
    - They offer grants and can put CONNECT in touch with private-sector sponsors to enact projects, they even specifically focus on improving the contamination of area recyclables[xviii].

Recommendations:

CONNECT Should enact the following:

- **Recommendation 1:** Adopt a Standardized Recycling Policy
    - A consistent message as to what is eligible for recycling is key. The message CONNECT gives their communities should be strong and for the most part unchanging from year to year. This way recycling knowledge will become common knowledge.
    - Glass causes contamination in the MRFs and varying glass collection policies from municipality to municipality creates confusion. We suggest CONNECT Communities universally remove glass from their single stream collection. Other glass collection solutions, such as the ones previously mentioned, should be implemented on a larger scale.
    - To further improve contamination levels, CONNECT should create the standard of loose recycling instead of in bags which often just get sent to the landfill.
- **Recommendation 2:** Lead a Broad Public Education Program
    - Many of the issues previously addressed can be solved with further education of the public. We suggest that once CONNECT creates a set list of recyclable items, they implement an education initiative to the public.
    - We suggest the creation of graphics to be sent to households in the form of a refrigerator magnets, so they are easy access in the areas where people do most of their recycling. Suggested graphics include one which explains what can and cannot be recycled and one that explains the recycling process once the materials leave the home. The graphics should also stress the dangers of single use plastics and other materials, encouraging users to switch to reusable products.
    - Easy to read graphics on what can and cannot be recycled will help ensure all citizens are not accidentally throwing something that should be trash into the recycling bin, education at the beginning of the stream will help to address contamination rates. Additionally, graphics which show how the recycling process works can help citizens better understand what becomes of their waste, helping them to make more educated decisions when they dispose of it
- **Recommendation 3:** Create a Municipal level Data Collective
    - The Recycling Partnership emphasizes the importance of proper and consistent data collection as a first step to improving recycling programs. The partnership has a set of datapoints they suggest gathering information for on a regular basis[xix]. See Appendix B.
    - Additionally, it was recommended by the Centre County COG that tonnage of waste which enters the landfill should be recorded[xx]. This is so comparisons can be made between amount of waste and amount of recycling, and trends can be captured.
    - This data collective can be the mission of the next working group or done by a part-time basis individual funded by The Recycling Partnership or other entity.

Conclusion:

These strategies will help to address the issue of high contamination rates in recyclables through the creation of a common system. Widespread education will increase citizen knowledge, helping them to recycle better. The consolidation of the region's recycling data will make information more accessible as well as easier to analyze and track progress. As citizens become more comfortable with the recycling system, it will increase recycling volume and decrease contamination levels, creating an overall positive change for the CONNECT community.

Sources:

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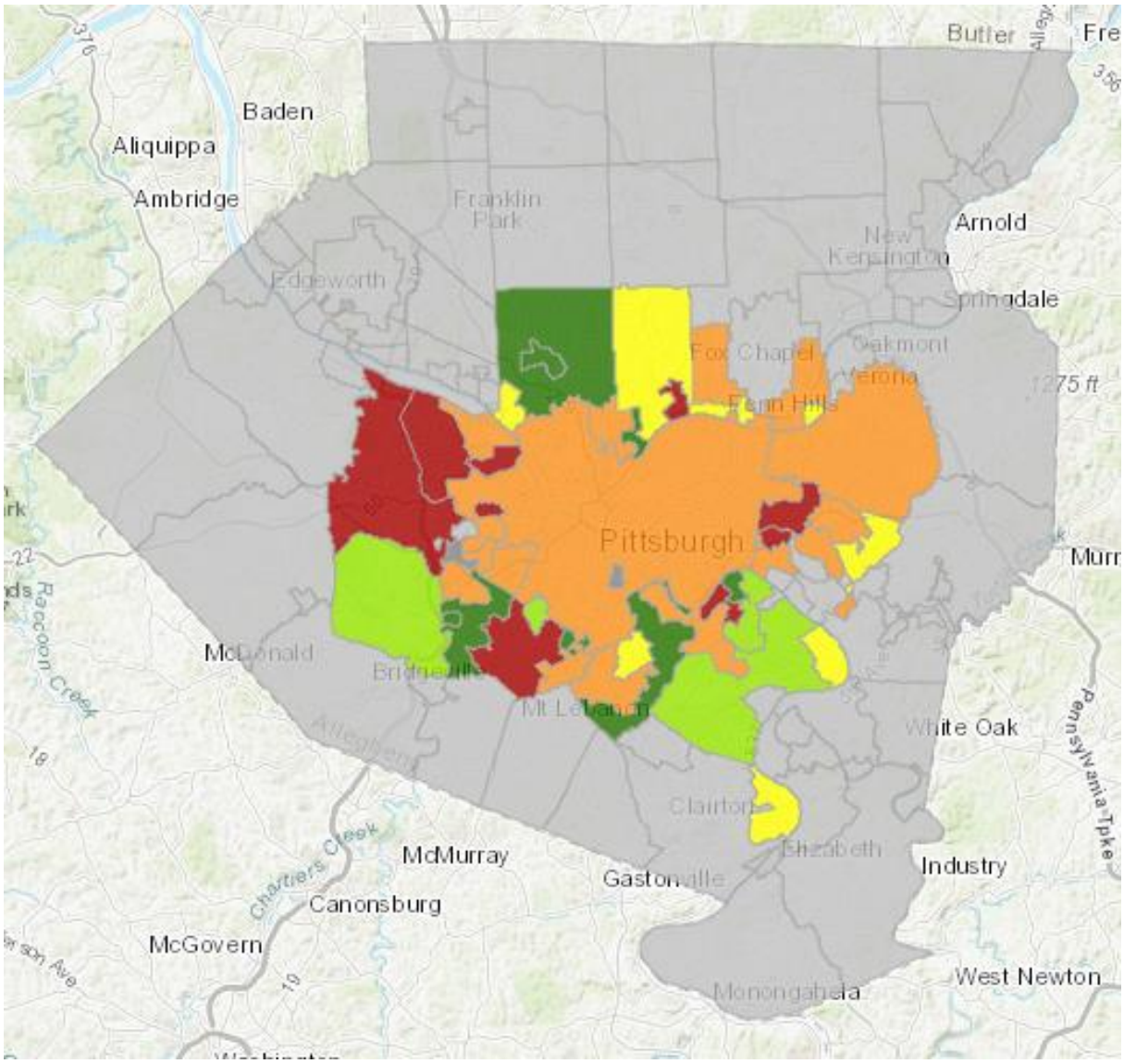
Appendix A

Figure 1: Total Average Change in Recycling Tonnage 2013-2018



Map Key	
Large Increase	**90% and Higher**
Small Increase	**40% to 89%**
Little Change	**0% to 39%**
Small Decrease	**-19% to -1%**
Large Decrease	**-20% and Lower**

Figure 2: Average Change in Residential Recycling Tonnage 2013-2018

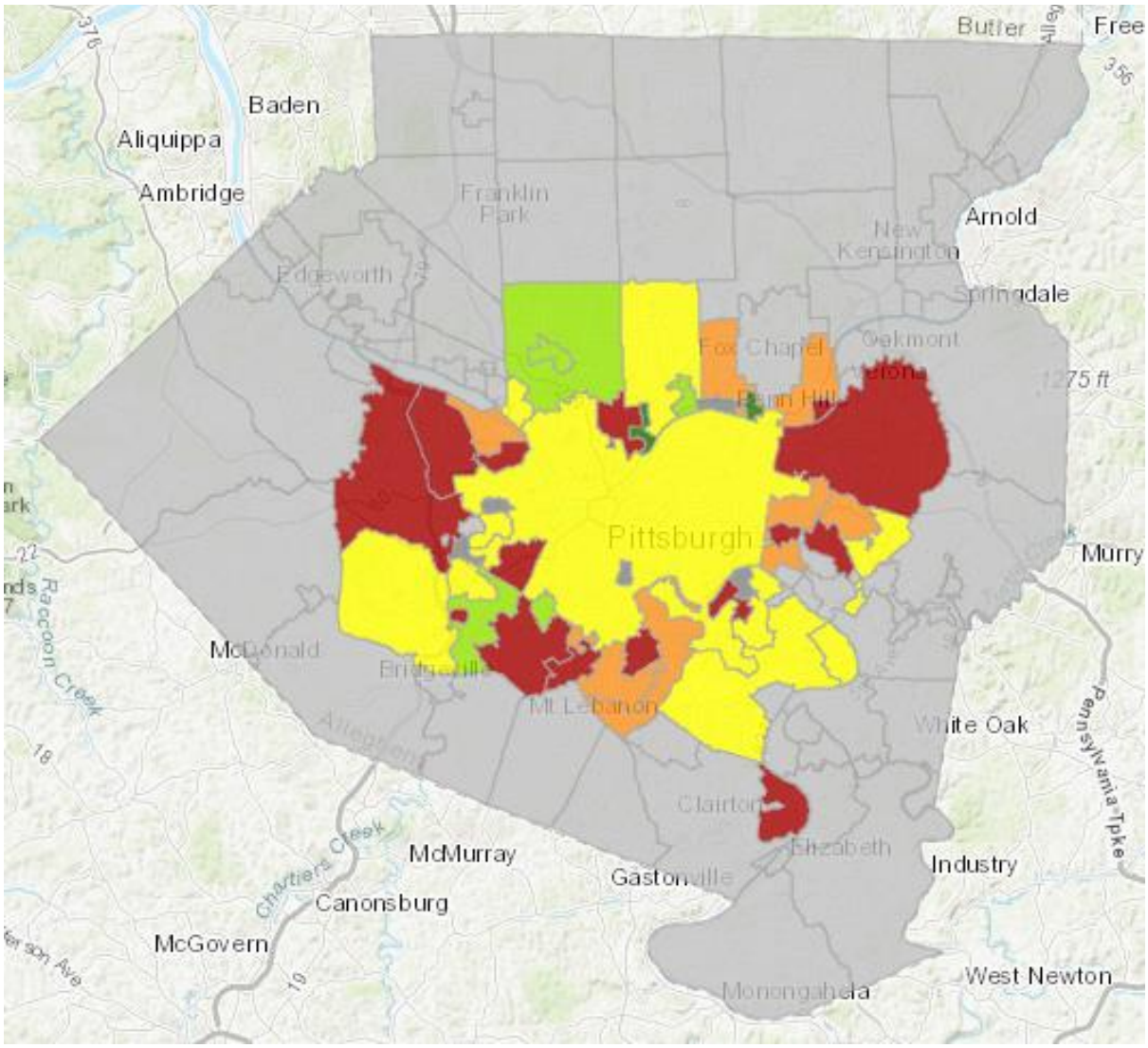


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Table 1: Recycling Tonnage Data

Municipality	2013 Total	2013 Residentia	2018 Total	2018 Residentia	5 Year % Change	% Residential Change
Aspinwall	194.91	89.64	232.19	224.53	19%	150%
Baldwin Borough	1,515.10	1,258.10	1284.65	1063	-15%	-16%
Baldwin Township	41.62	-	219.27	-	427%	-
Bellevue	372.21	330.11	458.7	341.28	23%	3%
Blawnox	85.91	63.48	94.38	39.87	10%	-37%
Brentwood	2,404.82	1,915.62	3036.71	760.17	26%	-60%
Carnegie	800.00	496.00	728.89	598.04	-9%	21%
Castle Shannon	549.31	495.01	470.22	377.92	-14%	-24%
Churchill	334.95	321.35	311.82	294.66	-7%	-8%
City of Duquesne	95.07	71.17	129.96	76.56	37%	8%
City of Clairton	176.68	127.16	232.49	67.74	32%	-47%
City of Pittsburgh	121,080.42	18,027.14	99548.41	18979.87	-18%	5%
Collier	943.94	469.15	1583.15	646.99	68%	38%
Crafton	1,118.97	639.96	1077.64	785.71	-4%	23%
Dormont	506.21	440.74	770.47	644.54	52%	46%
Edgewood	958.10	648.90	207.98	101.6	-78%	-84%
Etna	448.23	101.00	214.86	169.15	-52%	67%
Forest Hills	644.58	546.00	550.6	352.41	-15%	-35%
Green Tree	644.58	546.00	550.6	352.41	-15%	-35%
Heidelberg	24.44	24.44	63.41	8.13	159%	-67%
Homestead	153.63	-	926.01	-	503%	-
Ingram	126.18	126.18	0	-	-100%	-
Kennedy	1,296.33	684.70	872.55	514.45	-33%	-25%
McKees Rocks	432.12	197.36	277.51	113.58	-36%	-42%
Millvale	102.69	94.79	203.32	183.52	98%	94%
Mount Lebanon	9,303.30	6,149.30	6454.82	4838.82	-31%	-21%
Mount Oliver	-	-	1.15	-	-	-
Munhall	512.98	487.48	730.8	512.01	42%	5%
O'Hara	4,672.06	1,568.03	4193.11	1388.25	-10%	-11%
Penn Hills	7,154.30	2,837.80	5949.62	2175.5	-17%	-23%
Reserve	202.49	202.49	180.94	159.37	-11%	-21%
Robinson	7,090.80	3,546.60	4505.17	2032.59	-36%	-43%
Ross	2,019.28	1,631.27	4295.2	2500.41	113%	53%
Rosslyn Farms	-	-	-	-	-	-
Scott	1,920.78	778.29	6923.35	1140.66	260%	47%
Shaler	4,474.52	2,693.55	4559.74	2788.26	2%	4%
Sharpsburg	31.66	9.97	33.75	-	7%	-
Stowe	95.31	95.30	80.6	77.8	-15%	-18%
Swissvale	95.31	95.30	80.6	77.8	-15%	-18%
West Homestead	741.59	270.57	583.13	1.5	-21%	-99%
West Mifflin	4,540.58	1,071.93	6583.84	1279.08	45%	19%
West View	412.61	291.90	810.71	536.63	96%	84%
Whitehall	1,181.59	929.76	1134.06	817.26	-4%	-12%
Wilkins	1,224.51	416.70	1351.44	500.44	10%	20%
Wilkinsburg	1,572.95	1,311.65	1236.39	1054	-21%	-20%
Total	**182297.62**	**52,101.89**	**163734.21**	**48576.51**	**-10.18%**	**-6.77%**

*Municipality List taken from CONNECT website 9/2019; we acknowledge that membership statuses may have changed since

Appendix B[xxi]

- City
- State
- Population
- EPA Region
- Recycling Website
- General phone number
- Number of Households Serviced (All, %, district, #)
- Number of Households in Community
- Number "Residential Collection" Style Units from American Community Survey
- Number of Multifamily collection style units from American Community Survey
- Total Units from American Community Survey
- Curbside Yes/ No
- Public Action Yes/ No
- Container cart/bin/bag Container Detail
- Container Size Detail (gal)
- Frequency of Collection (w/eow/other)
- Annual Curbside Recycling Tonnage
- MRF
- MSW Tip Fee
- Material Mix (Single Streaming /dual/multiSingle Stream)
- Service Type
- Private Comprehensive Collection Y/N
- Private Open Subscription (hire choice) Y/N
- Private Franchise Subscription (hire specific hauler(s)) Opt-in Y/N
- Private Comprehensive (only in specific district) Y/N
- Private opt-in (only in specific district) Y/N
- Public Comprehensive Collection Y/N
- Public Subscription (opt-in) Y/N
- Public comprehensive (only in specific district) Y/N
- Funded through tax or Fee Y/N
- Funded through direct payment to hauler Y/N
- Link to accepted material list

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[i] Members (CONNECT University of Pittsburgh), accessed September 2019, https://www.connect.pitt.edu/Membership-and-Community/Members)

[ii] Barton & Loguidice, "2019 MUNICIPAL SOLID WASTE MANAGEMENT PLAN" (Allegheny County, September 2018), https://www.alleghenycounty.us/uploadedFiles/Allegheny_Home/Health_Department/Programs/Waste-_and_Water-Related/Recycling/2019-Allegheny-County-SWMP-Update.pdf)

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[vii] Erika Deyarmin-Young (Waste Management) in discussion with the author, 28 October 2019.

[viii] Ibid.

[ix] Ibid.

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[xiv] Matt Heckel, "Lawmaker Proposes Bottle Bill for Pennsylvania," ABC27, October 7, 2019, https://www.abc27.com/news/pennsylvania/lawmaker-proposes-bottle-bill-for-pennsylvania/)

[xv] Pam Adams (Centre County COG) in discussion with the author, 25 October 2019.

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[xxi] Cody Marshall (The Recycling Partnership) in discussion with the author, 24 October 2019.