

Can public construction and demolition data describe trends in building material recycling? Observations from Philadelphia

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Supporting information

System Boundary

To understand patterns of change in C&D waste flows over the study period, we adapt the construction waste management system and waste flows in the Philadelphia region (SI Figure 1 in supporting information) from the framework used by Bertram et al. (2002) for copper in the C&D waste category among all end of life (EOL) waste categories in Europe. However, we examine all material fractions within C&D waste, resulting from construction activities within the built environment. These wastes are either collected for disposal or sent directly to scrap markets. For example, in some cases concrete waste is converted directly to value-added construction materials (Bilal et al., 2016; Lockrey et al., 2018; Wu et al., 2019) such as recycled concrete aggregate for new concrete by either recycling at demolition sites or by shipping the demolished concrete to centralized plants for conversion to aggregate. Materials deemed waste are collected and transported by haulers or transported directly by contractors to WRFs, processed on site and then distributed to landfills or recycling (secondary material) markets. Some of the recycled materials return to construction sites as recycled building materials and then re-enter the built environment (SI Figure S1). At the WRF, wastes are separated and recycled and then finally disposed.

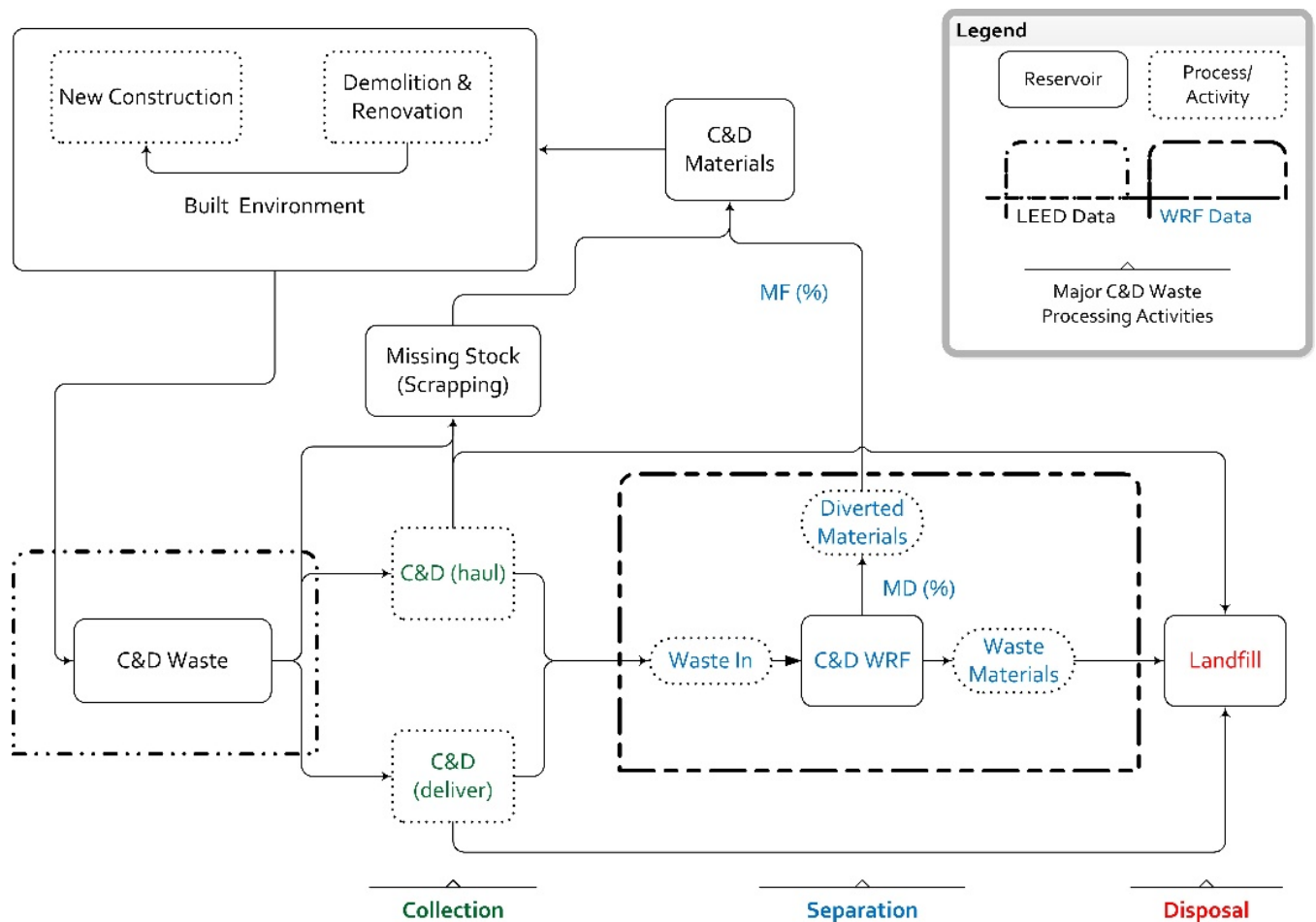


Figure S1 – Construction waste management system in the Philadelphia region. Materials are stocked in the built environment, WRFs, or landfills. The materials resulting from on-site C&D activities are collected and transported to the C&D WRF, reused on site in new construction, scrapped on site, or landfilled. At the C&D WRF, materials are separated and sorted for sale into different secondary markets, from which they may re-enter the built environment. Materials that cannot be recycled or diverted are sent to the landfill.

Full Size Figure Support Figures 1a-1b

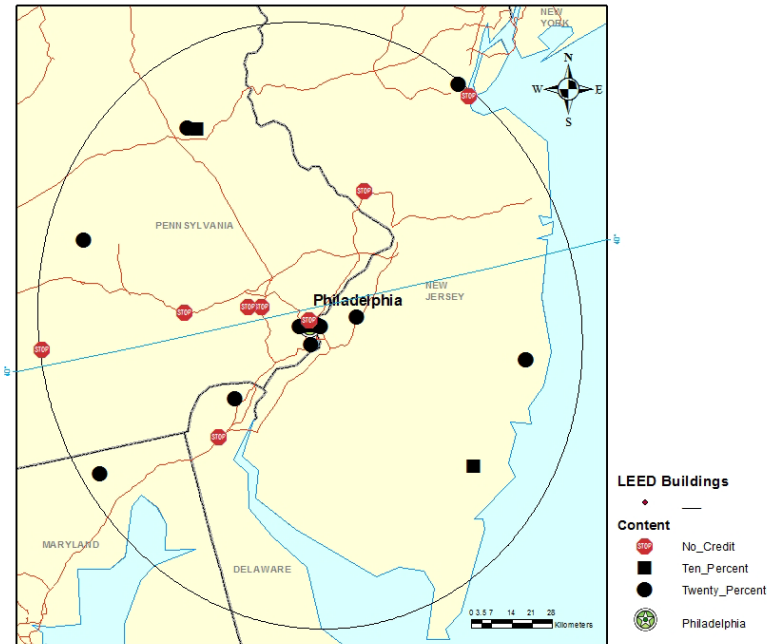


Figure S2a. Maps 2007-2008, Recycled content credit

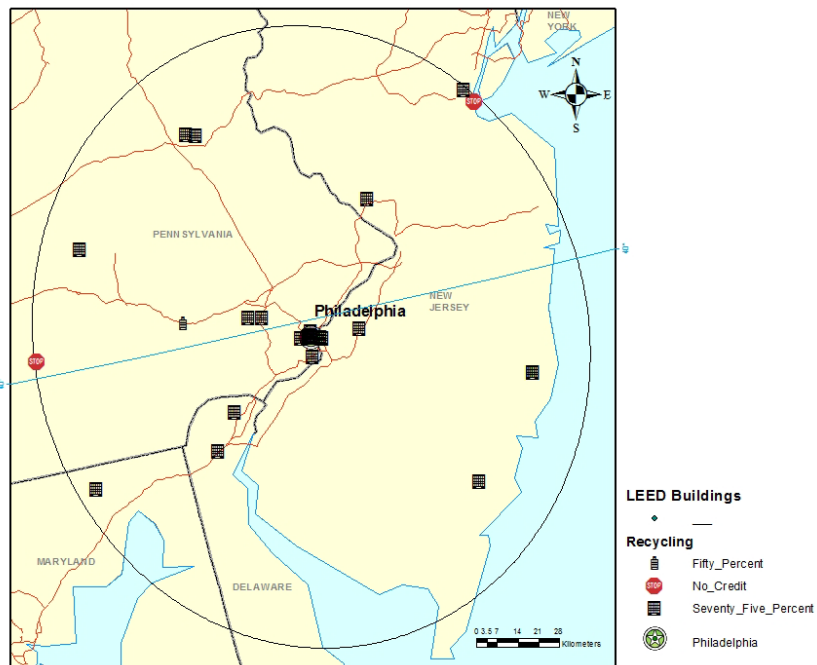


Figure S2b. Maps 2007-2008, Construction waste management credit

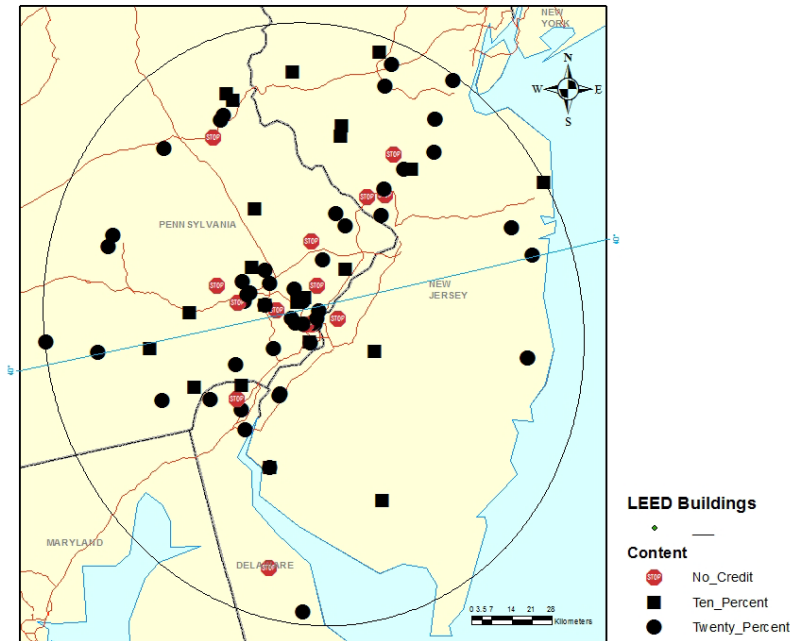


Figure S2c. Maps 2009-2010, Recycled content credit

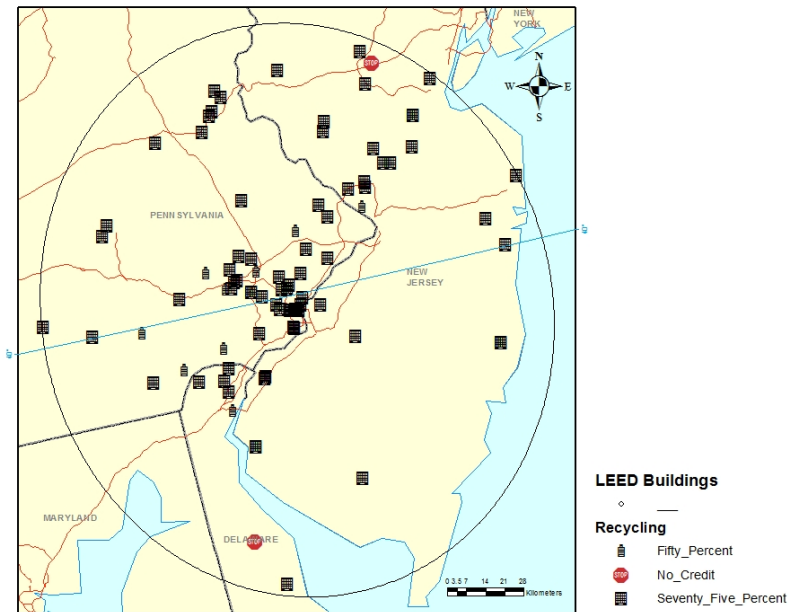


Figure S2d. Maps 2009-2010, Construction waste management credit

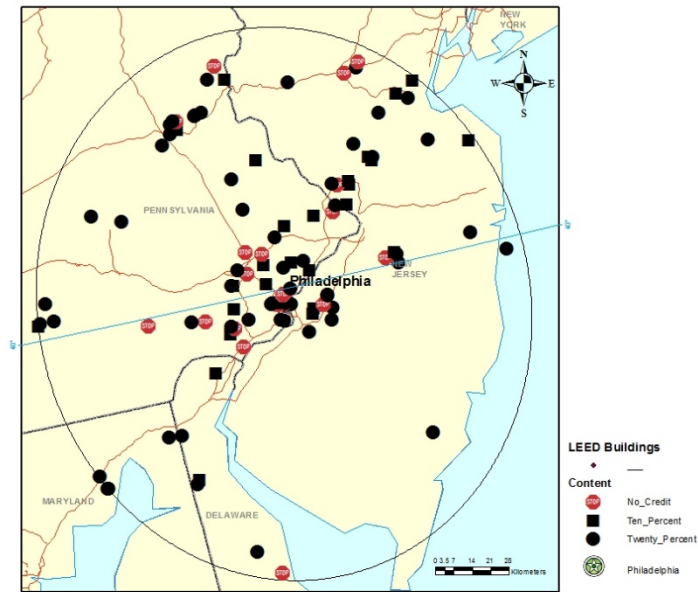


Figure S2e. Maps 2011-2012, Recycled content credit

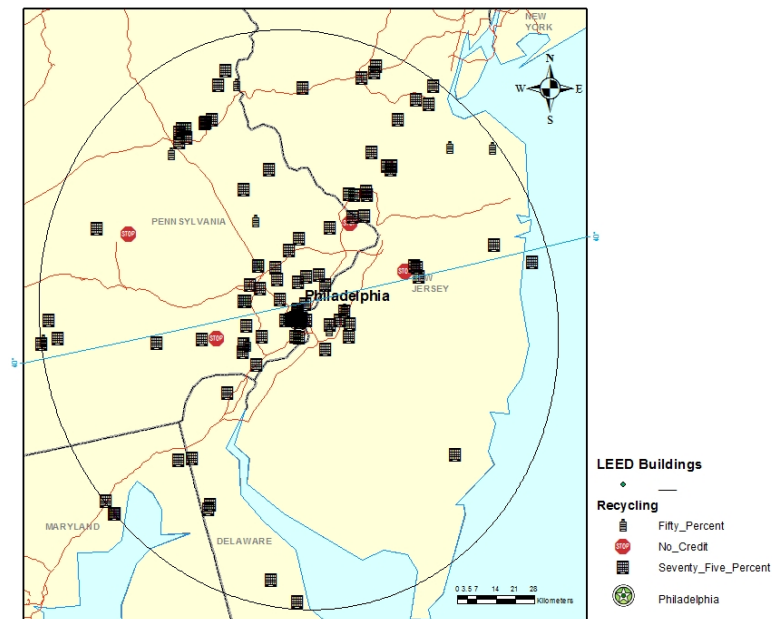


Figure S2f. Maps 2011-2012, Construction waste management credit

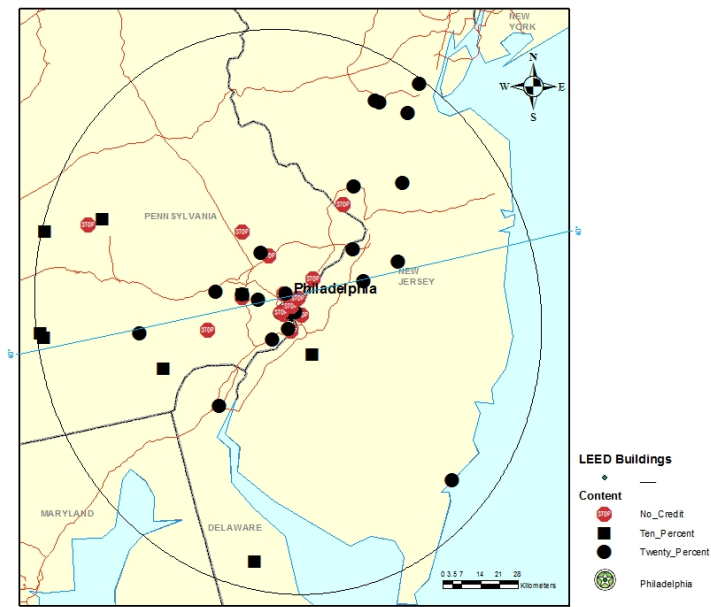


Figure S2g. Map 2013, Recycled content credit

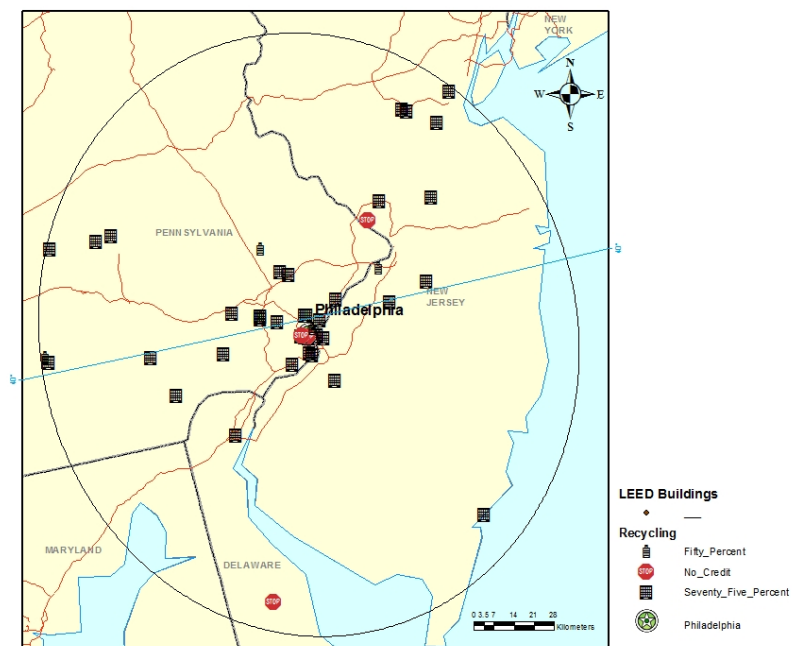


Figure S2h. Map 2013, construction waste management credit

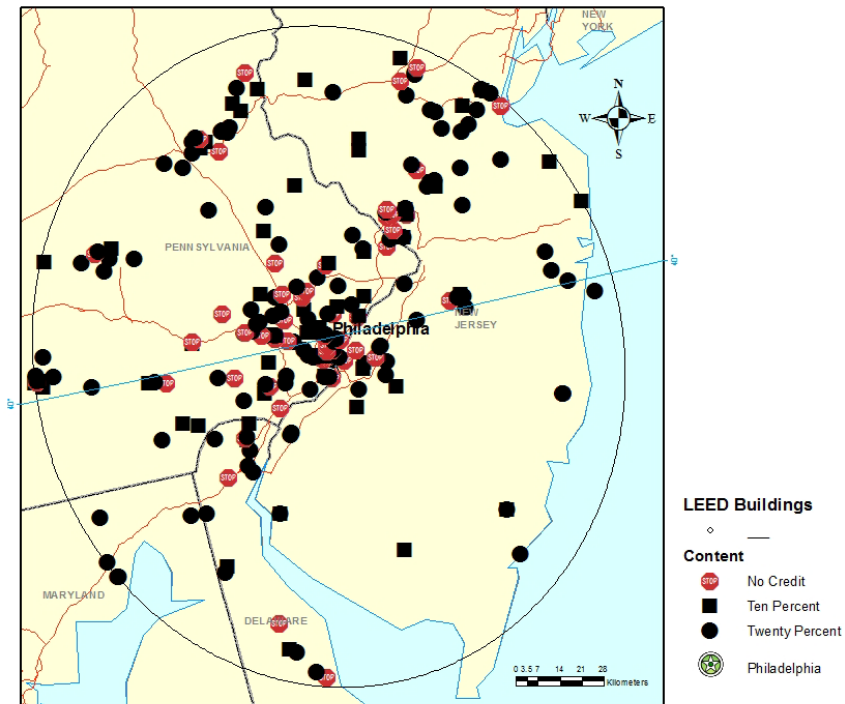


Figure S2i. All years, recycled content credit

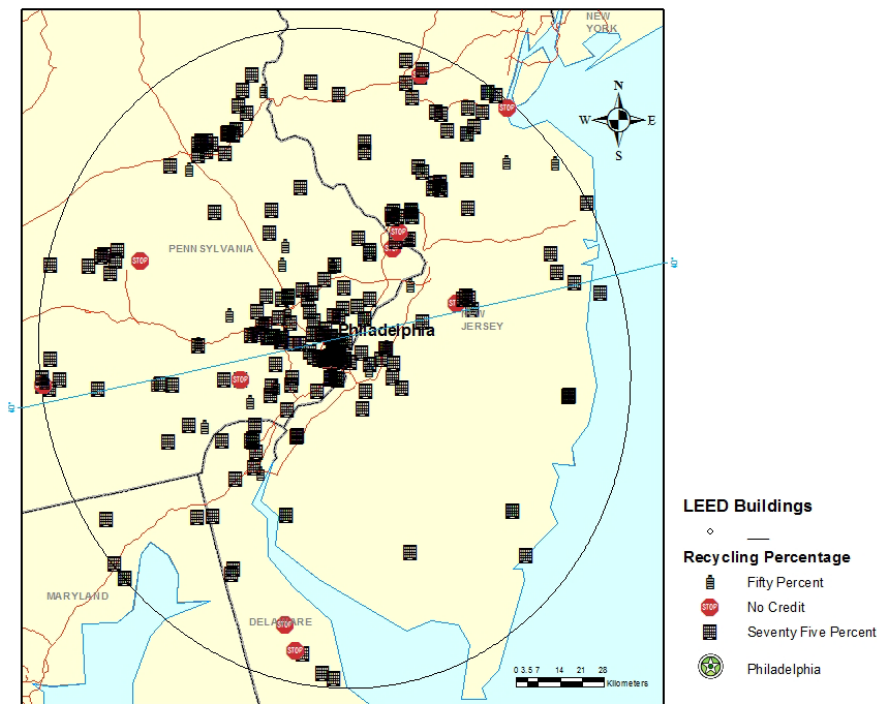
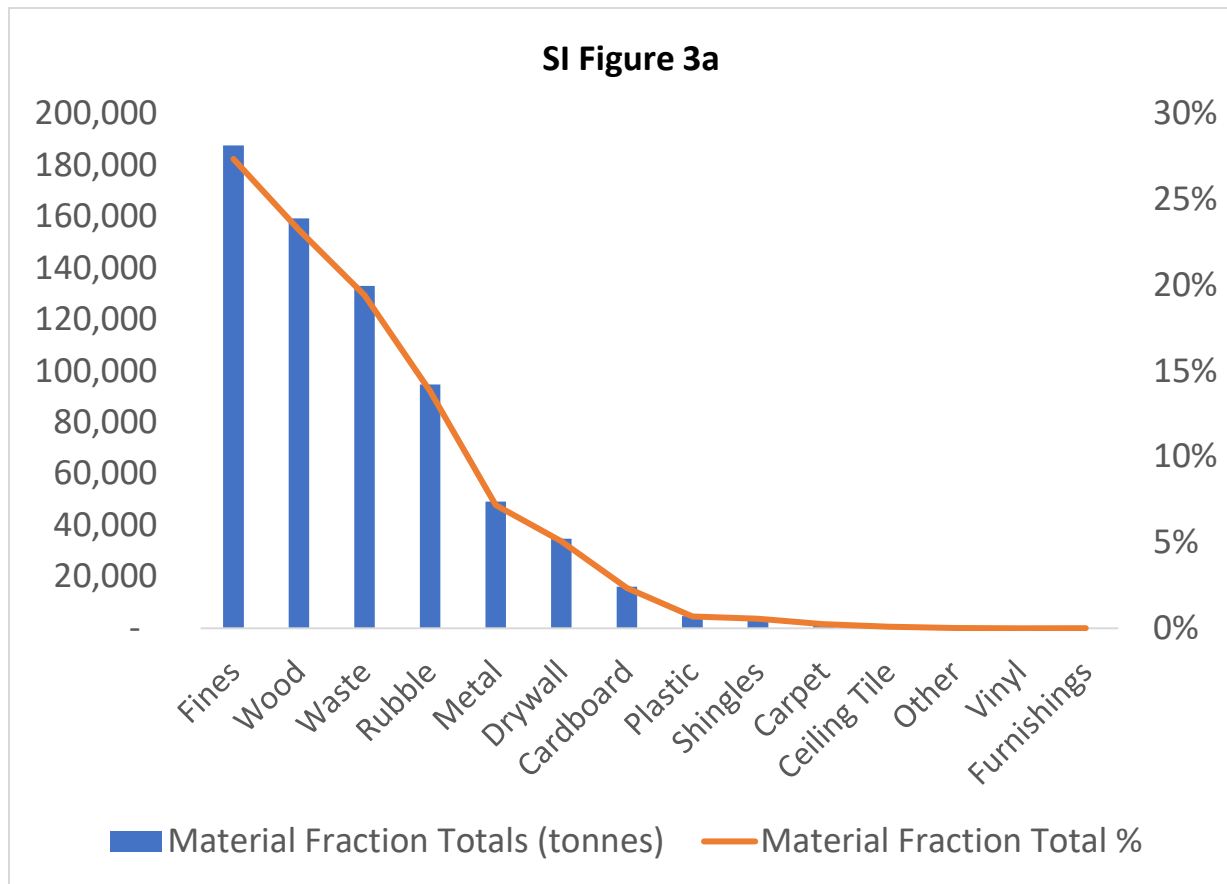
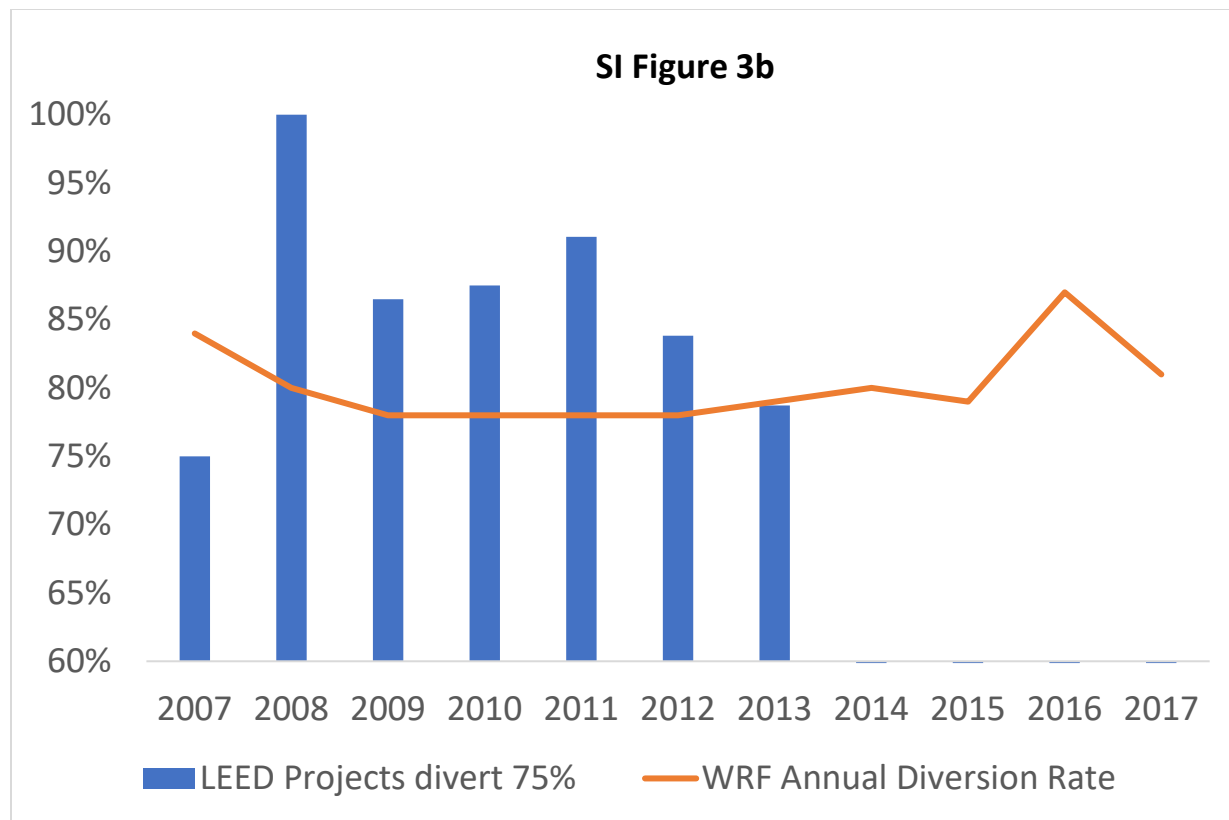


Figure S2j. All years, construction waste management





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