

Chapter 5 Contents

5.1 Existing Conditions

5.1.1 Introduction

5.1.2 Legal Authority

5.1.3 Waste Types

5.1.4 Risks to Health and Environment

5.1.5 Solid Waste Hauling Rules

5.1.6 C&D Waste Data

5.1.7 Recycling and Landfilling

5.1.8 Reuse and Waste Reduction

5.1.9 Education and Outreach

5.2 Needs and Opportunities

5.2.1 C&D Recycling

5.2.2 C&D Recycling Toolkit

5.3 Evaluation of Alternatives

5.4 Findings and Recommendations

Appendix Q – Construction Demolition Legislation

Chapter 5

Construction, Deconstruction, and Demolition

5.1 Existing Conditions

5.1.1 Introduction

Construction and demolition (C&D) projects produce a wide variety of debris and wood waste that makeup 24.2% of landfilled waste in Washington by weight.¹ C&D waste is produced by residents and businesses through remodeling projects, new construction, building demolitions, building deconstructions, land clearing, and other related activities. The term C&D mainly refers to wastes that are not hazardous and can be disposed of in a landfill, though C&D projects also produce hazardous waste. The diversion of C&D materials from the landfill relies on the availability of reuse and recycling markets, and the participation of the construction industry. This chapter of the solid waste management plan describes the management of this waste in Clark County, with opportunities and recommendations for improving C&D waste management.

5.1.2 Legal Authority

Most C&D wastes are regulated as municipal solid waste (MSW), while some specific materials require special handling and/or disposal as hazardous waste. The waste generator is responsible for designating waste onsite to ensure proper disposal of dangerous materials. Appendix Q summarizes legislation relating to C&D waste. The Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology) are the primary regulatory agencies. The legislation includes solid waste transportation laws; testing requirements for asbestos, polychlorinated biphenyls (PCB), and lead; clean air regulations concerning asbestos and plaster; contaminated material disposal; inert waste disposal; hazardous waste disposal; landfill requirements; demolition permits; lead-based paint demolition certification; and others.

5.1.3 Waste Types

Waste uniquely produced during C&D activities can include the following six material types: (1) bulky waste, (2) deconstruction materials, (3) demolition debris, (4) hazardous waste, (5) inert waste, and (6) new construction materials.

1. Bulky waste describes large and/or heavy materials including:
 - a. Asphalt (from roads and roofing shingles)
 - b. Bricks
 - c. Carpet
 - d. Concrete
 - e. Ceramics
 - f. Glass

¹Washington State Department of Ecology. (2021). 2020-2021 Washington statewide waste characterization study. Retrieved from <https://apps.ecology.wa.gov/publications/SummaryPages/2107026.html>

- g. Gypsum (the main component of drywall)
 - h. Metals
 - i. Plastics
 - j. Salvaged building components (doors, windows, lighting, and plumbing fixtures)
 - k. Tiles
 - l. Trees, stumps, soil, and rock from land clearing
 - m. Wood
2. Deconstruction is a method used before demolition to carefully recover materials from the structure to be reused or recycled. Building components in good condition may be salvaged for reuse, such as appliances, cabinets, doors, windows, sinks, toilets, and lighting fixtures. Items of architectural interest are particularly popular to salvage, including antique wooden beams, hardwood flooring, antique hardware, industrial items, stained glass, chandeliers, and interesting metal features like fencing or railings. There are companies and non-profit organizations that can be hired to perform deconstruction and manage the salvaged materials, prior to demolition or remodeling.
 3. Demolition debris is made during the destruction of buildings and other infrastructure. The material resulting from demolition is dirty and unable to be separated by material type for recycling or diversion from the landfill. The resulting debris pile must be lab tested for dangerous waste and must be managed either entirely as MSW or as dangerous waste depending on the results. Sampling materials prior to demolition allows specific components to be removed and disposed of as dangerous waste before demolition.
 4. Hazardous waste, also known as dangerous waste, is commonly produced from C&D projects and must be managed according to Dangerous Waste Regulations, Chapter 173-303 WAC. Building components being disposed of must be screened to designate dangerous wastes. Hazardous C&D waste can include asbestos, leftover paint, adhesives, aerosols, solvents, used shop towels, materials coated with lead paint, lead pipes, materials containing PCB, contaminated soil, contaminated water, mercury-containing lights, radioactive smoke detectors, and more. Wastes designated as dangerous must be disposed of through a certified hazardous waste management company. Some hazardous materials may be recycled, including paint, motor oil, batteries, mercury-containing lights, and other materials through product stewardship programs and universal waste rules. The amount and types of hazardous waste produced will impact a business' generator status. See Chapter 6 for more details on hazardous waste.
 5. Inert waste includes the waste materials listed below if the waste has not been contaminated through exposure to chemical, physical, biological, or radiological substances, causing it to become a threat to health or the environment. Inert waste will not decompose. Inert materials can be recycled through specific merchants, disposed of in a MSW landfill, or disposed of in an inert waste landfill.
 - a) Aluminum
 - b) Asphaltic materials
 - c) Brick and masonry
 - d) Ceramic materials produced from fired clay or porcelain
 - e) Cured concrete
 - f) Glass
 - g) Stainless steel
 6. New construction materials that are left over during C&D projects can be reused, recycled, or disposed. This may include any of the materials described above that were purchased new for use on the project. New construction materials are among the easiest materials to reuse or recycle

because they are produced in a predictable schedule and are less likely to be mixed with MSW or hazardous items. Leftover materials are not typically saved for future projects, though their clean state allows them to be easily separated and recycled where vendors are available. Hazardous products leftover from new construction may include paint, adhesives, aerosols, and cleaning chemicals, which can be saved for future projects. The unused hazardous products must be disposed of according to hazardous waste regulations when discarded or unwanted.

5.1.4 Risks to Health and Environment

C&D wastes are produced in large quantities during new construction, demolitions, and remodeling projects. It is common to have waste requiring special handling and disposal. Hazardous materials can have a significant impact on health and the environment. Illegally dumped, buried, or burned waste may have dangerous effects on public safety and the environment. Following demolitions, representative samples of the debris must be collected and tested for dangerous materials such as lead and asbestos, before the debris may be disposed of. The following section describes unique C&D wastes that may be of concern for public health and/or the environment and require special handling and disposal.

Asbestos

Asbestos is a naturally occurring group of heat resistant and fibrous minerals. Asbestos was historically used for insulation, fire-resistant coatings, automotive brakes, adhesives, roofing, drywall, ceilings, and thousands of other building materials and products. Asbestos is now considered a dangerous material because repeated inhalation of asbestos can result in lung damage and cancer. Cases of repeated exposure may lead to mesothelioma and death. Specific uses of asbestos have been restricted through regulations passed by the EPA from 1970 to 2019, though most uses of asbestos are not banned. It is common for buildings constructed up until the late 1990s to contain asbestos in levels requiring special handling and disposal during C&D projects. Environmental pollution from asbestos is dangerous mainly due to the risk of humans to be exposed to the material. Asbestos does not decompose and can remain a threat for long periods of time.

All waste materials that may contain asbestos must have testing completed prior to disposal, including interior walls and ceilings; exterior walls; flooring; insulation; fireproofing material; heating system components; gaskets; roofing material; electrical material; and other miscellaneous items such as adhesives, caulks, patching, and window glazing. Asbestos disposal is available at CTR and West Van transfer stations in Clark County for materials that have tested positive for asbestos. As of 2022, the rate for asbestos disposal is about \$268/ton. Asbestos-containing materials disposed at CTR and West Van are carefully bagged and transported in uncompacted roll-off containers for special disposal at the Wasco County Landfill in Oregon. Staff at Wasco County Landfill have a separate designated area of the landfill where asbestos is safely buried. Protective measures are used to prevent asbestos material from being released into the air.

Contaminated soil and water

Soil and water may be contaminated on C&D sites due to old industrial activity, petroleum spills, mining operations, smelter plumes, paper mill chemicals, and other hazardous material spills. Soil or water contamination is also possible through naturally occurring arsenic, asbestos, radon, lead, fluoride, and other substances. Lead is a common contaminant in soils due to lead-based paint (LBP) on exteriors of old homes and buildings, old spills of leaded gasoline, smelter plumes, or other industrial

activity. Contaminants are grouped into different categories: volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and metals. Contamination from soils can be absorbed by new plant growth which is dangerous for people growing food on contaminated soils. Wildlife that consumes contaminated plants can also be harmed. Runoff and drainage from polluted sites can contaminate water systems and drinking water.

Digging and grading in new construction projects can release toxins from the soil and may expose workers and the public to toxins. Dust and stormwater runoff must be prevented at construction sites due to the possibility of harming health and contamination leaving the site. Construction sites are required to have construction stormwater permits, issued by Ecology, before performing any activity that could impact stormwater, such as the release of sediments, chemicals, and debris. Contaminated soil and water may be designated as dangerous waste if it exceeds toxic thresholds. Some types of contaminated soil may be disposed of in special waste landfills. For more information on hazardous waste and remedial action sites, see Chapter 6.

Drywall and plaster

Plaster is a hard-drying paste used to coat walls and ceilings in construction projects. It can be made up of gypsum, lime, cement, or in very old buildings, clay. The most common plaster in new construction projects is comprised of gypsum powder, which is the same material used in drywall. Plaster and drywall dust is harmful to inhale because of the small crystalline particles present that damage tissue. Repeated exposure can cause silicosis, chronic obstructive pulmonary disease, and asthma. The use of respirators and eye protection are recommended to prevent inhalation and eye irritation from these particles. Proper ventilation and wetting of dust also reduce the risk of inhalation. Though these materials are dangerous to inhale, drywall and plaster are not considered hazardous wastes and may be recycled through specific vendors as available or disposed of in an inert waste landfill.

As gypsum drywall decomposes in an anoxic landfill, hydrogen sulfide gas (H_2S) may be produced. H_2S is a colorless, flammable, and poisonous gas with the distinctive smell of rotten eggs. Exposure to H_2S can damage respiratory function, and prolonged exposure impacts the nervous system and may increase susceptibility to infectious diseases. H_2S can contaminate water and soil, though it typically evaporates into the air. In the air, H_2S may react with other gases to form sulfur dioxide, which is a contributor to acid rain. As of 2021, there are no federal regulations concerning H_2S gas emissions from landfills, though the Occupational Safety and Health Administration (OSHA) has established H_2S exposure guidelines to reduce worker exposure to the gas in industrial settings. OSHA set a limit of 20 parts per million (ppm) for H_2S in workplace air, to be limited to 15 minutes of exposure, which is not to be exceeded at any time.

Hazardous waste

Hazardous items not uniquely identified in this list may still be present at C&D sites. These include common items and products such as fluorescent lighting, unused paint, pesticides, fertilizers, mercury-containing thermostats, solvents, and other paint-related materials. The various chemicals pose different dangers to public health and the environment. They can be flammable, poisonous, corrosive, explosive, hazardous to inhale, or any combination of these hazards. Littered or spilled hazardous items can pollute soil, water, sediment, and air, as well as cause fires, threaten wildlife, and endanger public health. Commercial sources of hazardous waste must be disposed of using a certified hazardous waste management company. Residential sources are considered household hazardous waste (HHW) and

may be disposed of at no charge at Clark County's three HHW facilities. See Chapter 6 for more details on hazardous waste.

Insulation

Thermal insulation in buildings can be comprised of a variety of materials including fiberglass, mineral wool, plastic, and natural fibers such as asbestos, cellulose, cotton, vermiculite, and wool. Insulation is used in wall cavities, ceilings, around air ducts, under flooring, and in attics to slow the transfer of heat. Asbestos, fiberglass, and vermiculite insulation pose health risks during construction or demolition projects. Before regulations restricting use, asbestos was widely used as thermal insulation in residential and commercial buildings due to its natural insulating properties. Vermiculite is also a natural fiber mined and used for insulation and is often contaminated with natural asbestos. In demolition projects, vermiculite insulation must be lab tested for asbestos prior to disposal. Asbestos may be present in insulation in buildings constructed up until the late 1990s and must be handled and disposed of responsibly. See the section above on asbestos for more information. If insulation tests negative for asbestos, it may be disposed of as MSW.

Fiberglass insulation, also known as glass wool, is the most common material used in new construction and is made from plastic reinforced with small spun glass fibers. When installing or disturbing fiberglass insulation, the glass fibers may become airborne. Inhalation of the glass fibers is dangerous as this can irritate or damage the throat, mouth, lungs, and nasal passages. Fiberglass may also irritate skin and eyes, so the use of personal protective equipment (PPE) is essential when handling insulation. Long-term exposure to fiberglass has been associated with an increased risk of lung cancer and mesothelioma, and mainly impacts staff from manufacturers of fiberglass. OSHA established workplace synthetic fiber inhalation limits to improve safety for manufacturing and construction operations.

Lead

Lead is a naturally occurring heavy metal that has historically been used in paint, ceramics, pipes, plumbing materials, solders, and many more products used in homes and industrial settings. After being regularly used throughout the world, lead was found to be toxic to humans and animals, causing widespread health effects and environmental pollution across air, soil, water, plants, and wildlife. Exposure to lead causes a wide variety of problems as it is absorbed and stored in the bodies of humans and wildlife. In people, lead poisoning causes neurological disabilities, organ damage, and a range of malaise. It is especially damaging to children, who show signs of severe toxicity at low levels of exposure. Lead ingested by wildlife has also caused widespread ecological disruption.

Lead is a common material from demolition or remodeling projects on buildings, homes, and infrastructure older than 1978 due to LBP. During the demolition of buildings containing LBP, dust from paint chips will become a hazardous source of exposure and must be mitigated. The EPA's LBP Renovation, Repair, and Painting (RRP) program rule passed in 2008, requiring contractors, construction companies, painters, or other subcontractors to be RRP certified by the EPA. RRP certification trains firms in best management practices to mitigate lead exposure during C&D projects by maintaining cleanliness, controlling dust, disposing of contaminated material, and other safety requirements. Debris from older homes must be lab tested for the presence of lead and may designate as dangerous waste. Lead pipes and other lead-contaminated debris are dangerous wastes and must be managed through a certified hazardous waste management company.

Non-hazardous Materials

C&D materials that are not designated as dangerous waste can also pose safety and environmental risks if improperly managed. Bulky wastes like bricks and rubble are heavy and can injure people that are unqualified or unequipped to move them. Nails and other sharp construction debris can cause injury and harm if littered or disposed of in the wrong place. Improperly managed debris, even inert waste, can become litter, clogging stormwater systems, or causing hazards on roadways. Additional problems occur when contractors underestimate the amount of garbage service they require on C&D sites. This can cause garbage containers to overflow, creating litter that can pollute nearby environments and water. Wastewater facility engineers in Clark County have also observed C&D material in incoming wastewater, mainly in the form of used rags. This indicates that C&D waste was flushed down toilets due to a lack of garbage service during the clean-up phase of nearby new construction. Wastewater treatment facilities are not built for bulky material, so it impacts facility equipment and disrupts operations.

Noxious Weeds and Invasive Species

C&D sites must follow noxious weed control rules and invasive species quarantine guidelines. Abandoned piles of soil and yard debris from C&D projects can grow noxious weeds, breaking state law. If a landowner does not control noxious weeds, they may receive warnings from Clark County Vegetation Management. If no action is taken after receiving several notifications, Vegetation Management may visit the site to control the weeds and will send the landowner a bill for the service, or they may issue a civil infraction. Yard debris may also be host to invasive insects or other organisms and must be carefully managed to prevent the spread of invasive species. Yard debris may be disposed of at mulch or compost facilities that accept yard debris, diverting it from the landfill. Residents in unincorporated Clark County outside of urban growth areas may burn their yard debris with a permit, except when fire bans are in place due to wildfire danger. Residents may also subscribe to curbside yard debris and/or organics collections through the region's contracted hauler.

Polychlorinated Biphenyls

PCBs are a group of synthetic organic chemicals containing carbon, hydrogen, and chlorine, that were once widespread throughout industrial and commercial manufacturing. PCBs were used for their properties of non-flammability, chemical stability, high boiling point, and electrical insulation. PCBs were used in electrical equipment, hydraulic equipment, adhesives, plastics, rubber products, pigments, dyes, copy paper, and other materials. Construction materials containing PCBs included caulk, grout, expansion joints, sealant, coatings, varnish, lacquer, paint, coated metal sheets, asphaltic roofing, tar paper, electrical equipment, thermal insulation, electrical insulation, and fluorescent light ballasts.

The use of PCBs caused widespread environmental contamination, and wildlife experienced bioaccumulation of PCBs. Consumption of PCB-contaminated fish is harmful to human health, especially for children, pregnant women, fetuses, and nursing infants. Health effects are diverse, including cancer, skin conditions, and harm to reproductive, immune, endocrine, and neurological systems. Manufacturing of PCBs was banned in 1979 under the TSCA, though environmental contamination is still present throughout the U.S. In demolitions and renovations, PCBs may be present in buildings constructed before 1980, and debris must be tested for PCB prior to disposal. Materials containing PCBs designate as dangerous waste, though there are exclusions described under

Dangerous Waste Regulations, Chapter 173-303-071 WAC. Contamination of the surrounding environment may fall under the Model Toxics Control Act (MTCA).

Treated Wood

Wood treated with oils and chemicals may be a unique waste from C&D projects. Wood may be treated with chemicals and oil to prevent decay, fungal growth, and insect damage. Commonly treated wood products include power line poles, railroad ties, cross arms, fence posts, playground equipment, log homes, and other outdoor structures. Older wood preservatives contained toxins like arsenic, chromated copper arsenate (CCA), creosote, copper, and pentachlorophenol. CCA is one of the most common chemical formulations found in treated wood and contains chromium and arsenic which are hazardous and may leach into soil and water if improperly managed.

Repeated exposure to any of these chemicals can cause adverse health effects including damage to organs, the nervous system, skin, eyes, and digestive system, and can cause headaches, dizziness, and sometimes death, especially in the case of arsenic exposure. Treated wood should not be burned as this may release toxic chemicals into the air. Commercial sources of treated wood waste must be disposed of as dangerous waste if it does not meet exclusion conditions outlined by Ecology. Treated wood from commercial sources that are not designated as dangerous waste must be disposed of in a special waste landfill. Residents may dispose of treated wood as regular MSW. Reuse of treated wood is not recommended due to the toxins present.

5.1.5 Solid Waste Hauling Rules

Violations of solid waste hauling rules are common with contractors and private recyclers handling and hauling C&D waste. Violations may occur at any stage of construction activities, from the site management to the end disposal or recycling facilities. The purpose of this section is to describe the hauling rules in detail, as they relate to C&D. More details on solid waste enforcement and operations can be found in Chapters 1 and 3.

The Washington Utilities and Transportation Commission (WUTC) regulates the hauling of solid waste in Washington and issued Waste Connections the permit, known as a G-certificate, for MSW (garbage) collection and hauling in unincorporated Clark County. The G-certificate gives Waste Connections the exclusive authority to collect and haul MSW in unincorporated Clark County, including garbage from C&D sites. While the WUTC determines unincorporated county MSW collections, cities have other options. Cities may use the county's WUTC-permitted franchise, or they may contract directly with a solid waste company. Cities also have the right to own and operate a MSW collection service. Most cities in Clark County use Waste Connections through either contract or defaulting to the WUTC-permitted franchise. The exceptions to this are the City of Camas and the City of Woodland.

The City of Camas owns and operates its own MSW collections for residents and businesses within city limits, with some exceptions. Waste Connections may provide service for businesses needing large roll-off containers, which the city does not provide or service. This may include large roll-off containers typically used at C&D sites. The City of Woodland is also unique as Woodland is located across both Clark and Cowlitz counties. Customers within Woodland city limits are serviced by Waste Control. Woodland addresses that are in unincorporated Clark County are serviced by Waste Connections. In summary, aside from the Camas and Woodland exemptions described, Waste Connections has the exclusive authority to haul MSW in Clark County. Because of this, most C&D projects in Clark County will fall under Waste Connections' jurisdiction for garbage hauling.

Under some conditions, contractors may forgo garbage pick-up service from Waste Connections and will self-haul their solid waste to the transfer station. For a contractor to self-haul waste, all the waste must be produced, handled, and driven by the contractor's personnel, and hauled in a company-owned and labeled vehicle. Under this rule, clients and subcontractors cannot handle or load waste materials into the contractor's equipment. Similarly, for a subcontractor to self-haul solid waste from C&D sites, all the waste must be produced, handled, and driven by the subcontractor's personnel. Under this rule, the contractor and clients cannot handle or load waste materials into the subcontractor's equipment. In summary, garbage may only be self-hauled from commercial sites by the business that generated the waste, be it the contractor or a subcontractor. Mixed garbage from multiple contractors or subcontractors at the job site would not qualify for self-haul and would need to be collected by the certified hauler.

Hauling of recycling materials does not fall under the G-certificate and can be hauled by a company with a common carrier permit from the WUTC. A common carrier permit is issued for businesses hauling materials for profit, such as reusable or recyclable material from C&D sites. C&D sites may use any available company to collect clean, source-separated recyclable, or reusable materials from the site. The WUTC requires C&D sites to have a separate container for garbage when they have a container for recyclable material, to ensure the recyclable material does not become contaminated with any garbage. Contractors may also self-haul recyclable material to a permitted recycling facility (not a landfill or disposal facility). The material being recycled cannot be contaminated with garbage. Material is considered recyclable when it is separated for reuse or identified as recyclable by local city or county authorities.

5.1.6 C&D Waste Data

The 2020-2021 statewide waste characterization study from Ecology found that construction materials and wood waste, combined, made up 24.2% of all MSW by weight, displayed in Figure 5.1.² At a combined 24.2%, this makes up the largest portion of the statewide waste stream, closely followed by organics at 22.8% of the landfilled waste stream. Data from the 2012 Clark County waste characterization study is displayed in Figure 5.2, with C&D and organics waste also making up most of the waste.³ C&D and wood made up a combined 19% of waste, closely following organics at 23% of the waste stream. This 2012 data compared to the 2020-2021 statewide data shows that organics and C&D waste have made up the largest portions of MSW for many years. The difference between the two wastes, however, is that since 2012 there have been significant efforts to reduce and divert organics waste, while similar efforts to reduce or divert C&D waste have not occurred.

²Washington State Department of Ecology. (2021). 2020-2021 Washington statewide waste characterization study. Retrieved from <https://apps.ecology.wa.gov/publications/SummaryPages/2107026.html>

³Clark County Department of Environmental Services. (2015). Clark County solid waste management plan: Managing and coordinating our community's solid waste program. Retrieved from: <https://www.clark.wa.gov/public-health/solid-waste-management-plan>

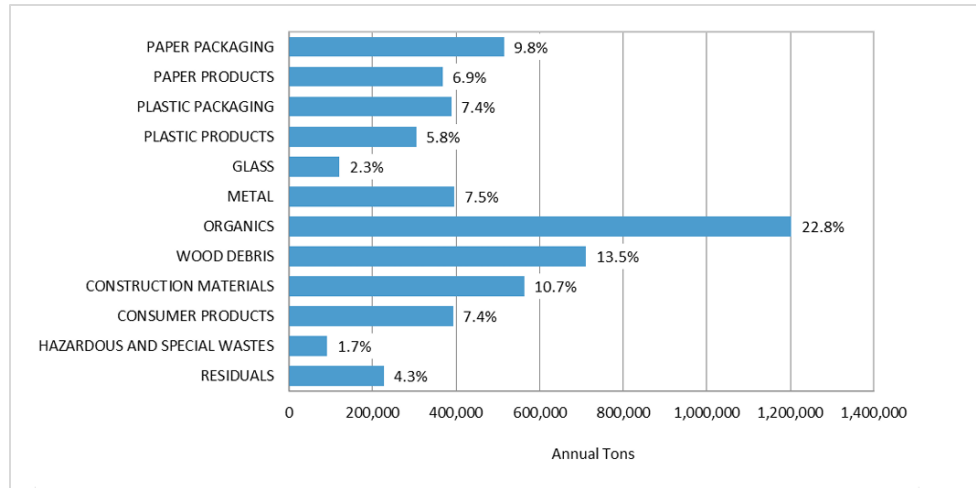


Figure 5.1: A bar graph from the Washington statewide waste characterization study displaying the summarized composition of MSW for the entire state of Washington. Detailed descriptions of each waste category can be found in the state report.⁴

Both waste characterization studies measured commercial and residential sources of MSW and found that the commercial industry disposes the most C&D waste statewide and that much of commercial C&D waste is self-hauled to disposal facilities. In the 2012 study, 63% of commercial waste self-hauled to the facilities was C&D and wood waste (Figure 5.3). This information can help guide future operations and infrastructure at the waste transfer stations. For example, programs, infrastructure, and services to divert C&D waste specifically from commercial self-haul would have other positive impacts on the solid waste system, such as improving traffic and user experience when self-hauling material to the facilities.

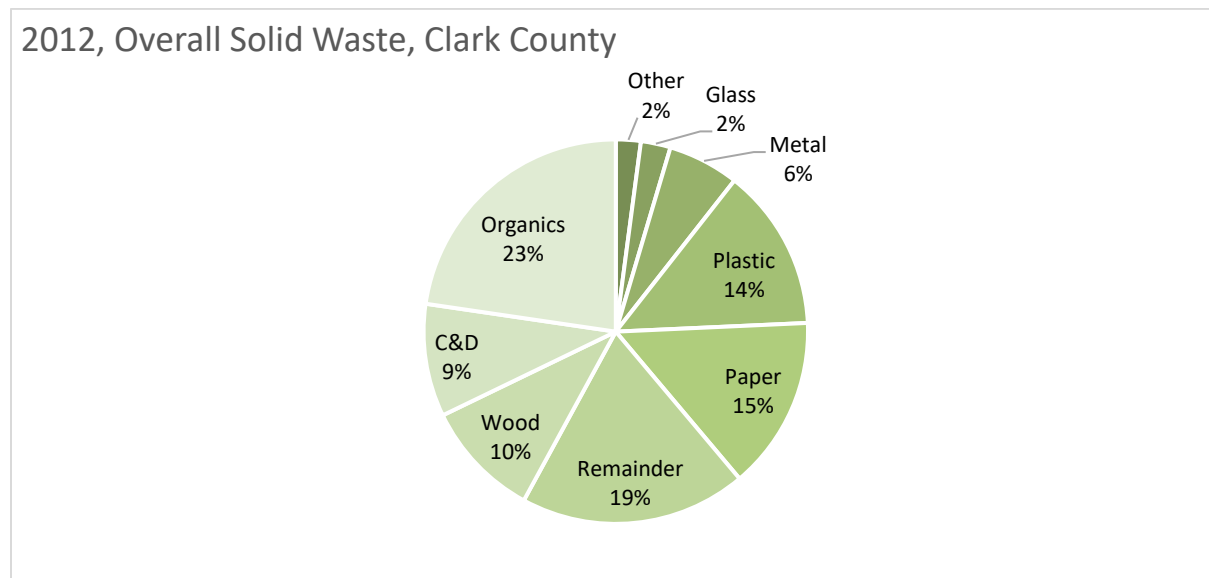


Figure 5.2: Overall waste composition results from the 2012 Clark County waste stream analysis. Measurements included MSW from residential self-haul, commercial self-haul, residential curbside

⁴Washington State Department of Ecology. (2021). 2020-2021 Washington statewide waste characterization study. Retrieved from <https://apps.ecology.wa.gov/publications/SummaryPages/2107026.html>

collections, commercial compactors, and commercial on-site collections. "Remainder" includes garbage like diapers and cosmetics. "Other" waste includes materials like electronics and hazardous waste.

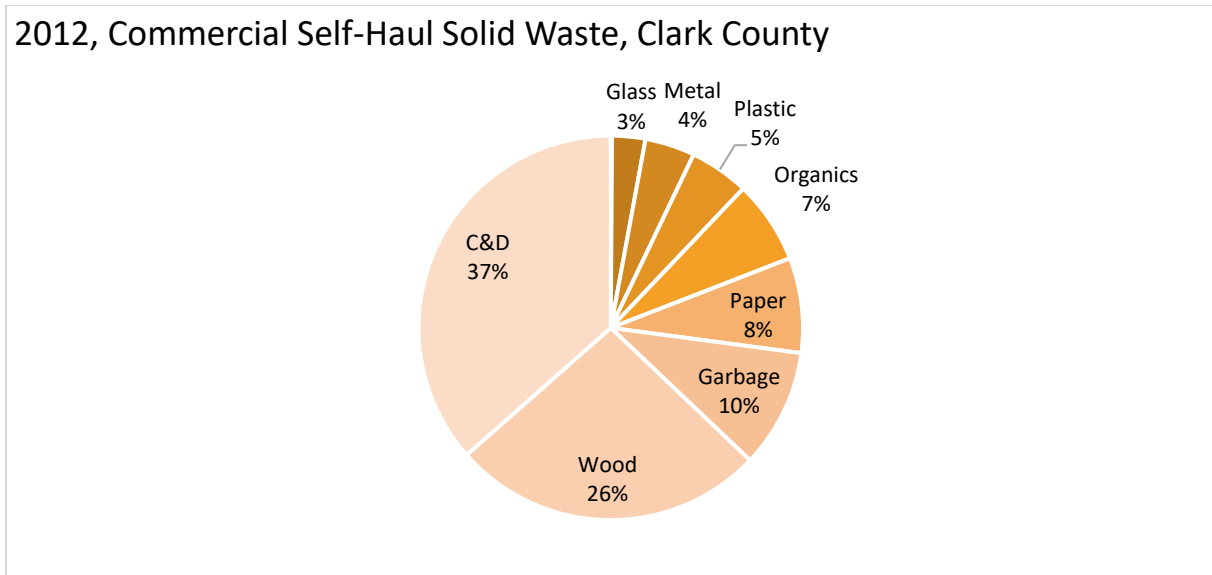


Figure 5.3: Self-hauled commercial MSW waste composition results from the 2012 Clark County waste stream analysis.

5.1.7 Recycling and Landfilling

Wastes disposed of in Clark County are transferred to the landfill through the three transfer stations that are owned and operated by Columbia Resource Company (CRC), a subsidiary of Waste Connections. The stations include West Vancouver Materials Recovery and Transfer Facility (West Van), Central Transfer and Recycling (CTR), and Washougal Transfer Station (WTS). Previous attempts to increase the scale of C&D recycling at the transfer stations have failed due to sorting and recycling market challenges, so most C&D material entering the facilities is landfilled as MSW. MSW is transferred and disposed of in the Finley Buttes Landfill. Special wastes such as asbestos require a permit from Waste Connections to dispose of at the transfer stations, where they will be safely transferred for disposal at the Wasco County Landfill. The Wasco County Landfill can accept MSW, inert waste, and special waste. Special waste as defined by the landfill includes asbestos, non-hazardous liquids, and non-hazardous contaminated soils.

The amount of C&D material and wood waste from Washington being disposed of is estimated at 1.3 million tons annually, and most C&D waste is from commercial sources. Diverting this material stream from the landfill is challenging under the best of conditions because recycling markets and vendors available in the region are inconsistent. There are no recyclers in Clark County accepting mixed loads of C&D waste as of 2022, so accessing the various recycling vendors is challenging. Various private vendors in the region offer to recycle specific, source-separated, clean C&D materials such as clean wood, rubble, unpainted drywall, cardboard, carpet, and others, though recycling markets and availability fluctuate over time. Specialized deconstruction companies are experienced in salvaging components of a building to recycle or reuse before construction or demolition begins, though this service adds cost and time.

To recycle C&D waste from a job site, the recyclables must be source-separated and free of garbage and hazardous waste. The onsite sorting is challenging, requiring special attention from all workers onsite, extra space for the recycling containers/drop-boxes, and extra staff time to learn the system and maintain clean collections. The C&D materials separated for recycling must then be self-hauled to a recycling facility, requiring vehicles and staff, or for some materials, an onsite pick-up can be arranged. These disadvantages can increase costs and they make recycling C&D material undesirable. It is easier to manage waste according to what is legally required; only managing hazardous and special waste separately from MSW. Unless policy prevents it, C&D companies are more likely to landfill all non-hazardous material because it is simple and less time-consuming than current voluntary diversion practices.

Enforcement of solid waste rules at facilities that accept and/or transfer C&D waste for recycling is also a challenging aspect of managing this waste stream. Mismanagement and violations of Public Health permits and WUTC rules are common for C&D recycling and transfer facilities. Violations often include: stockpiling waste, transporting MSW without a G-Certificate, landfilling wastes accepted for recycling, unauthorized processing methods (i.e. incineration, burying onsite), and accepting drop-offs of unapproved waste, sometimes hazardous waste. In theory, the inert nature of C&D waste simplifies the permitting of new recycling facilities compared to other solid waste processing facilities, such as those for organics which decompose and cause odor and vector concerns. However, the history of violations inherent in the recycling industry needs to be addressed and resolved before recycling C&D waste can be considered a fully environmentally-preferable solution to reducing landfilled C&D waste.

5.1.8 Reuse and Waste Reduction

Waste reduction strategies will be essential within the construction industry to reduce the large quantity of C&D waste being landfilled, among other environmental impacts of the industry. The waste hierarchy prioritizes waste reduction before recycling and safe disposal. Recycling is less effective than waste reduction, especially when the recycling markets are inconsistent and C&D recycling vendors violate waste management rules. The large quantities of C&D waste being landfilled will not significantly reduce by relying on recycling alone. Waste reduction, deconstruction, reuse, sustainable material sourcing, purchasing of recycled materials, and designing structures to be long-lasting and repairable will drive environmental improvements within the C&D industry.

Contractors working towards sustainable building certifications have requirements for recycling and waste reduction that exceed the standards of typical construction or renovations. Certifications may include Leadership in Energy and Environmental Design (LEED®), National Green Building Standard, Green Globes Certification, Evergreen Sustainable Development Standard, and Washington Sustainable Schools Protocol. These certifications act to reduce the environmental impact of construction and buildings through many environmental standards including waste reduction, reuse, recycling, and waste-to-energy metrics.

Other standards may be set through government policy. EPA procurement rules require government agencies to buy products made with recovered materials. This includes requirements to use recycled content in building insulation and cement and concrete containing fly ash. Furthermore, as of 2022, the U.S. General Services Administration (GSA) requires all new construction and renovations of federally-owned facilities to achieve a minimum of LEED® Gold certification status. The GSA also provides guidance on waste diversion and recycling for wider federal projects, updating their requirements every five years.

Local governments may also adopt policies to address C&D waste. Work has begun locally through the Climate Action Framework adopted by the City of Vancouver, Washington in 2022 to reduce greenhouse gas emissions and build resiliency to climate change impacts.⁵ The framework includes example actions to specifically address C&D waste, such as promoting deconstruction, developing green building policies, and the possible implementation of City ordinances or incentives to drive improvements. Similar strategies built to drive waste reduction will be more effective than relying on C&D recycling vendors and markets alone.

5.1.9 Education and Outreach

Outreach and education to specifically target C&D waste is limited by SWEO programs and rely on Waste Connection educators. Clark County's recycling contract includes requirements for the contracted hauler to employ recycling educators, including one part-time educator dedicated to C&D waste. Historically, this educator's role was limited to tracking and reporting waste and recycling data from customers seeking LEED® or other sustainability certifications during renovation or construction. This work plan expanded in 2022 to pursue additional elements to improve C&D recycling outreach. This role expansion includes providing more outreach materials, technical assistance, and research on recycling and reuse options for C&D waste that could be utilized. Additional educational resources for

⁵City of Vancouver, Washington. (2022) Climate action. Retrieved from <https://www.cityofvancouver.us/cmo/page/climate-action>

C&D waste management are available on the Clark County website,⁶ and regional solid waste partner sites including Waste Connections,⁷ and the online Recycling A-Z directory.⁸ Individual assistance is available when requested.

5.2 Needs and Opportunities

5.2.1 C&D Recycling

There is a widespread need for more recycling of C&D materials, and this relies heavily on locally available recycling processing or transfer facilities. Most C&D materials that enter the transfer stations in Clark County are not recycled. Various recyclers of specific C&D materials operate privately in Clark County, though it is for limited source-separated material at various locations. No companies are recycling mixed loads of C&D waste in Clark County. Previous attempts by CRC to accept and sort mixed loads of C&D waste for recycling have failed, largely due to sorting challenges and unreliable recycling markets.

One method to increase C&D recycling, as used by King County, Washington, is to build C&D recycling markets through an ordinance requiring defined types of C&D waste to be recycled at designated C&D recycling facilities. As of 2022, there are no existing facilities in Clark County that recycle C&D waste on a large scale, but an ordinance directing C&D material to a recycler would incentivize larger C&D recyclers to open operations in Clark County. To approve such vendors, Clark County would request proposals to enter agreements with private C&D recyclers, who could then open locations in the county. Such agreements would include strict operational and administrative requirements like the following:

- Compliance with all applicable regulations, laws, and permitting requirements
- Suitable techniques for screening incoming material to prevent accepting MSW, hazardous waste, and other non-C&D wastes
- C&D materials will be recycled at a specified rate
- Incidental MRW will remain under a specified percentage of incoming material and will be disposed of following WUTC rules
- Hours of operation are accessible
- The facility will provide Clark County with accurate data, including measurement of incoming materials, quantity recycled, quantity landfilled, and other metrics as needed

Other methods for increasing diversion could include partnerships with local planning departments and the contractor community. Having the ability to connect with builders before construction projects begin would allow SWEO staff to provide waste management resources and education for free programs such as PaintCare and E-Cycle Washington. Incentives to reduce waste could include reduced

⁶Clark County Public Health. (2022). Construction and Demolition Debris. Retrieved from <https://clark.wa.gov/public-health/construction-and-demolition-debris>

⁷Waste Connections of Washington, Inc. (2022). Construction and Demolition. Retrieved from <https://wcnorthwest.com/construction>

⁸Clark County Public Health. (n.d.). Recycling A-Z. Retrieved from <https://clark.wa.gov/public-health/recycling-z>

permit fees, or fees partially refunded after the contractor provides evidence of deconstruction, waste reduction, and other waste diversions.

Increasing recycling of C&D waste would reduce quantities of bulky and heavy C&D waste being disposed of as MSW, therefore reducing strain on the equipment and infrastructure. MSW managed at CRC transfer stations is compacted into shipping containers for transport to the landfill. Typical C&D wastes like concrete, gravel, bricks, wood and other rubble do not compact and can damage the compactor and shipping containers. This equipment is more suited for conventional MSW such as putrescible organics, personal care products, pet waste, non-recyclable paper, plastic, food-soiled items, and residue remaining after sorting commingled recyclables. Transferring this conventional MSW to the landfill is an essential public health and environmental service, preventing illness and pollution. Removing C&D material from MSW would reduce the risk of damages and maintenance delays, providing more resilience in the MSW transfer system.

Recycling C&D waste is additionally beneficial because it provides a new, marketable, usable resource without performing environmentally damaging activities like mining, mineral extraction, and deforestation. The marketable resource then provides local economic opportunities. The development of a recycling program for C&D waste will require a larger, comprehensive study of diversion methods and policy solutions for Clark County SWEO staff and partners to consider. The research will allow Clark County solid waste staff to gain expertise in C&D recycling, infrastructure needs, and general diversion methods to build into future programs and contracts.

5.2.2 C&D Recycling Toolkit

Voluntary recycling of C&D waste requires knowledge of where to recycle each material type, and the ability to source-separate the materials to be recycled. Clark County published a C&D recycling toolkit in 2009 that listed regionally available recycling vendors of C&D waste like asphalt, carpet, drywall, insulation, metal, plastics, plumbing, roofing, and rubble. This toolkit is now outdated, as recycling vendors have changed over time. Oregon Metro published an updated 2018-2019 toolkit that lists newer, regional options for recycling and salvaging materials, providing a more current resource for contractors and residents.⁹

Developing and distributing an updated toolkit specific to Clark County would allow the inclusion of regionally-specific contact information, recycling locations, and solid waste regulations that differ from Oregon. An updated toolkit could also include resources and general guidance for material reuse, deconstruction, and waste reduction. Updating these resources would also allow for the possible expansion of recycling options listed in the regional recycling directory known as RecyclingA-Z and the RecycleRight app. A new toolkit could be developed internally by SWEO staff or completed through a qualified contractor.

5.3 Evaluation of Alternatives

Further evaluation can be done by focusing on more detailed analysis of the following:

⁹View the Oregon Metro toolkit online at <https://www.oregonmetro.gov/sites/default/files/2018/07/30/2018-19-Metro-Construction-Salvage-and-Recycling-Toolkit.pdf>

- Deconstruction promotion and incentives
- C&D waste prevention and reuse methods
- C&D recycling markets
- Incentives and policy solutions

Evaluation could lead to targeted waste management efforts with wider environmental benefits like reducing greenhouse gas emissions and other pollution common in the industry. The research and resulting work could be designed to align with local economic and climate goals.

5.4 Findings and Recommendations

<u>Actions</u>	<u>Target Date</u>	<u>Costs¹</u>	<u>Responsible Party</u>	<u>Success Metric</u>
Chapter 5: Construction, Deconstruction, and Demolition				
Research C&D waste management and recommend actions	2028	<ul style="list-style-type: none"> • Staff time and/or cost of hiring a contractor 	Environmental Operations Specialist	A comprehensive research project is completed to be included in future SWMPs
Publish a new C&D recycling toolkit identifying regional recycling options for C&D wastes.	2024	<ul style="list-style-type: none"> • Staff time and/or cost of hiring a contractor • Printing cost 	Environmental Operations Specialist	A new toolkit is published online and in print for distribution to contractors
¹ Cost figures where noted may state whether capital costs or operational/programmatic costs/expenses.				