# Regional Solid Waste System Study

## Phase 2 Report: Regional System Facilities Plan

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**Final**


**Prepared for**

**Environmental Health**

**In Association with:**

AKS Engineering & Forestry Inc. | Bell & Associates | Swordfish Consulting Services

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# Phase 2 Regional System Facilities Plan

## Introduction

Regional Solid Waste System Study (RSWSS) Phase 1 Report, completed in October 2021, provided a comprehensive assessment of the County's transfer stations and recycling infrastructure. It resulted in identifying the needs and opportunities to make necessary improvements in the current infrastructure and investments necessary to provide the capacity to cost effectively manage waste over the next 20 years. It also included an evaluation of alternatives for serving fast growing areas of the County, the north/central portion of the County, a feasibility analysis for new materials recovery facility, and thorough financial analysis of the current cost of services.

Considering the findings and recommendations of the Phase 1 RSWSS, Phase 2 provides a more detailed analysis of the necessary system improvements using updated waste projection data based on the recently released 2020 census. This resulted in preparing facility master site plans for each of the three transfer stations. The investments for each facility are focused on short-term needs over the next five to seven years. Construction cost estimates have been updated and are presented in a six-year capital improvement plan (CIP).

Additionally, the master plans identify the investments needed to build out the facilities to meet future growth. Several of these investments depend on decisions with options to serve the north/central part of the County currently served by Central Transfer and Recycling Station (CTR). These options were described in Phase 1 RSWSS and updated in this Phase 2 Facilities Plan (Facility Plan). The County will need to decide a course of action prior to making major improvements to serve that portion of the County.

Likewise, major investments in the West Vancouver Materials Recovery Center (West Van) facility are dependent on a decision whether to relocate and build a new materials recovery facility (MRF). The Facility Plan includes a financial plan that demonstrates how future investments can be funded.

## Summary of Phase 1

### Background of Phase 1 RSWSS

Phase 1 RSWSS provided a comprehensive assessment of current operations and conditions of existing infrastructure. The facility conditions assessment found that generally the transfer station primary structures are in satisfactory to good condition with some minor improvements needed. However, the assessment of the operating conditions indicates that each of the three transfer stations needs significant modifications and expansions to efficiently handle the increased customer traffic and amount of waste received each day. Notably, since 1992 when the County began operating the transfer stations and loading containers to barge waste for disposal at the Finley Butte landfill in eastern Oregon in 1992, the population has increased by more than 100%. No major improvements have been made to either CTR or West Van transfer stations since then. The one change to the system occurred in 2009, when the third transfer station was constructed at the Port of Washougal, however, this facility will also need to be expanded.

During the preparation of the Phase 1 Report, the County entered negotiations with Columbia Resource Company (CRC), a wholly owned subsidiary of Waste Connections Inc., to extend the contract for operating the transfer station system. A key element of these negotiations was the decision on whether the County should execute its right to purchase and own the transfer station system. The current contract provided a second five-year extension until December 31, 2026. Due to timing considerations, the County and CRC initially extended the contract for one year to carry out further negotiations. The contract has been extended until December 31, 2027.

As part of the Phase 1 scope of work, the consultant team prepared an evaluation of the ownership options comparing the advantages and disadvantages of various institutional arrangements for ownership and operations of the transfer station system. The County has stated they are not interested in ownership of the MRF and would prefer it to be relocated to another site. The decision regarding ownership is under consideration.

### Summary of Findings - Capital Improvement Needs

The Phase 1 RSWSS Report provides a list of key findings for the County and cities to make decisions on regarding building the facilities needed to manage the region’s solid waste system and recyclables for the next 20 years. Although the three transfer stations have been well maintained, there have been no significant investments at either CTR or West Van in nearly 25 years.

The past 10 years the amount of waste being generated increased from 230,000 tons in 2010 to nearly 400,000 tons per year in 2020, an increase of 75%. The Office of Financial Management (OFM) projected Clark County may grow to as much as 612,000 population or 22% by 2035 (data from Phase 1 RSWSS Report is based on previous census information). OFM released new 2020 census data that shows the 2040 population is now estimated to increase to almost 720,000 by 2040. This will be discussed in the Updated Population Projections section of this report.

CTR receives 60% of all the waste generated in the County and has the largest number of self-haul customers. CRC recently completed a modification to improve the entrance to the CTR facility. This will improve the safety of ingress and egress for customers onto Hwy. 503. However, more improvements are needed to eliminate offsite queue problems and to increase transfer station capacity.

CTR not only receives the largest amount of waste currently, but it is located such that it serves the central and north part of the County, which is expected to have the largest growth over the next 20 years. Thus, the Phase 1 Report evaluated several options to meet this need. This includes expanding CTR on the adjacent parcel owned by Waste Connections of Washington (WCW) or perhaps building a new transfer station elsewhere in the region. Part of the rationale to relocating the facility is related to issues with access off Hwy. 503 and the transition of the adjacent property from rural commercial to residential uses.

Specific RSWSS Phase 1 Report findings include:

1. The County will need to decide on a long-term solution for serving the north central part of the County either by planning further expansion of CTR and/or by siting a new transfer station.
2. Over the next 10 years the County and its partners will need to invest an estimated $25 million (M) to $50M to upgrade and expand the existing transfer stations and MRF. The broad range is created by the fact that the County could decide to replace CTR and build a new transfer station.
3. Phase 1 of the CTR improvements include extending the inbound traffic lane and adding a new scale on the property's west side. The improvements will eliminate inbound customer traffic from queuing onto Hwy. 503. This could also include building an access ramp to the south end of the existing transfer station. This improvement is estimated to cost about $3M assuming the underlying soil conditions of the adjacent west property are acceptable.
4. Improvements to upgrade and expand the Washougal Transfer Station will need to be made over the next five years.
5. CRC has made some initial improvements to the West Van MRF processing system that will enhance system performance. A new processing system will be needed for the long term.

**Note:** Cost estimates for specific improvements have been updated in this Facility Plan.

The three transfer stations operating today were not designed to handle the current volume of traffic and waste quantities being received. Decisions to make improvements have been stalled by the current contractual arrangements with CRC. The County notified CRC of their intent to extend the operating contract for five years as stipulated in the current agreement. No decision has been made regarding the question of ownership. The County has the right to purchase the transfer stations by notifying CRC prior to December 31, 2027.

**Findings - Financial Analysis to Address Capital Improvements Needs**

In completing the Phase 1 Report, the JRMA consulting team completed a review of the total cost of operating the regional system. Working in cooperation with CRC, the financial analysis examined the current cost of operating the system for 2019. The purpose was to determine the actual cost of just operating the transfer station and recycling facilities. The financial review was conducted within the guidelines provided in the contract between the County and CRC. The analysis provides information that will enable the County to evaluate impacts on rates for making capital improvements.

1. The total operating cost for the three transfer stations is reported to be $8.9M in 2019. This includes full services from operating the gatehouses, managing traffic and waste volumes, and loading transfer trailers. It also includes CRC's internal transport operations to shuttle boxes and stage rolling stock and maintaining the physical infrastructure of each facility. It does not include long haul transportation to either the Wasco Landfill in The Dalles, Oregon by truck or the Finley Butte Regional Landfill in Boardman, Oregon by barge.
2. Based on the financial information provided it appears that the transfer stations have been fully depreciated. However, there may be some equipment that CRC is still depreciating.
3. Based on these financial conditions, the current operating margin, which is revenue in excess of direct and indirect operating expenses, is about 44%. Assuming facilities have been fully depreciated and paying an operating margin of 15%, the current rates generate about $5M/year that could be allocated to make capital improvements at the facilities. Over a ten-year period, this would generate approximately $50M.
4. Establishing a dedicated capital improvement fund from funds generated from current rates may negate or significant reduce the need to borrow monies or raise rates for the needed capital improvements.

**Phase 1 Recommendations**

The Phase 1 Report identified three scenarios for developing the infrastructure needed to meet the needs of the solid waste system for the next 20 years. In addition to the capital improvements required for the system, it provides the background information necessary to understand the critical issues related to the current contract extension and system ownership. Listed below are key recommendations.

1. The County should establish a fair operating margin to compensate CRC for continuing with operations of solid waste facilities for the next five years or for a set period to be determined.
2. Revenues generated in excess of the cost of services plus the established operating margin should be remitted to the County. The remitted revenues will be encumbered for future solid waste system facilities and improvements.
3. The County should establish a facility Renewal and Replacement (R&R) evaluation process and a dedicated fund that will maintain system assets.
4. The County should approve funds for implementing Phase 1 of the CTR site improvements to eliminate any potential for inbound customers from queueing onto the public right of way on state Hwy. 503. The improvements include extending the entrance road and new scale onto the adjacent property located west of the current transfer station. Details of these improvements should be negotiated as part of the contract extension.
5. The County should establish a minimum rate for all customers using the transfer stations. Under the current tip fee policies, customers that bring less than 300 lbs. are not paying the cost of services. Implementing this policy may also provide an incentive to subscribe to regular collection services or cause customers to make fewer trips by consolidating their loads.
6. The County should extend the hours of operations at both the West Van and WTS.

The results of the Phase 1 Report have detailed specific operational and master planning questions that need to be addressed as part of completing the CIP.

The key questions to be answered are as follows:

1. Should CTR continue to operate as the primary transfer station over the next 20 years or should a new transfer station facility be built?
2. Should the MRF continue to operate at West Van or should the MRF be sited at a more central location to where materials are generated, thus reducing overall collection and transportation costs, and using the vacated space for other system needs?

There were also additional recommendations to be addressed in the Phase 2 Report or in a future work plan as follows:

1. Complete the search to locate a new transfer station to serve the north/central parts of the County. The siting study should identify the preferred site for building a new station.
2. Complete subsurface investigations on the property west of CTR to determine the conditions or limitations for consideration of the option to expand CTR.
3. Complete a detailed plan for expanding the Washougal Transfer Station.
4. Complete the Renewal and Replacement (R&R)/CIP financial plan for the regional system.

Recommendations 3 and 4 above were included in the JRMA's work scope for the Phase 2 Report. These master plans will identify improvements to be constructed over the next five to seven years and should be incorporated into the longer-term master plans to complete improvements and expansions as required to provide service over the next 20 years. A CIP will be prepared using the specific projects identified in the

Facility Plan. For CTR, the County will need to review the updated cost of each option and proceed to evaluate which option to implement.

**Ownership: RSWSS Task 7 – Evaluation of Ownership Options**

The County is considering key contractual decisions regarding the current transfer station system and ownership structure (i.e., public ownership scenarios vs. continued private ownership and operation). These contractual decisions are framed by the current agreement for the services provided by CRC. The services include processing of residential recycling materials, operation of transfer stations, transport, and disposal at an out-of-county landfill. The original contract was renewed in 2006 for a period of ten years and provided for two five-year extensions. The second extension was for the period ending December 31, 2026. However, the County and CRC negotiated an extension to this contract to provide for operations of the transfer station system until December 31, 2027.

A Technical Memorandum and RSWSS Task 7 report on public ownership and private operation of the County solid waste system was completed in February of 2023. This document highlighted the following information.

The County contract with CRC provides the option for the County to purchase West Van and CTR stations for $1.00 with the right to purchase Washougal if the City of Washougal does not exercise the City's contractual option to purchase it. The soonest the County option can be exercised is December 31, 2027. The soonest the Washougal option can be exercised is December 31, 2027.

The RSWSS Task 7 provides an analysis of the advantages and limitations of the following ownership options for consideration:

- Owned and operated by a private company (status quo option).
- Publicly owned and operated by a private company under contract.
- Publicly owned with limited public operation (scale house only) with facilities operated by a private company under contract.
- Publicly owned and operated.

The County and cities support further evaluation of the formation of a multi-jurisdictional organization to manage the regional transfer system. The RSWSS Task 7 analysis focused on the types of organizational structures available under the Revised Code of Washington (RCW). The available options evaluated included:

- Interlocal Cooperation Act (ILA) – Chapter 39.34 RCW
- Joint Municipal Utility Services (JMUS) – Chapter 39.106 RCW
- Metropolitan Municipal Corporations (MMC) – Chapter 35.58 RCW
- Disposal District –Chapter 36.58 RCW

The Technical Memorandum also included background information related to potential implementation tasks for a public ownership model as follows:

- JMUS organizational details
- Conceptual organizational chart
- Salary ranges for staff
- Financial plan and budget considerations
- Draft implementation schedule
- Steps for implementation

At the Solid Waste Advisory Commission (SWAC) meeting on May 4, 2023, County staff recommendations were presented and voted on. SWAC adopted the following recommendations related to ownership.

- Solid waste staff recommend the County and or City of Washougal exercise the available contractual options to purchase the facilities when the option of public ownership becomes available.
- Solid waste staff recommended the option to publicly own and privately operate the regional transfer facilities under contract to be further evaluated. The evaluation should focus on the advantages and disadvantages of public operation of the scale houses versus fully contracted services.
- Solid waste staff recommend further evaluation of JMUS model. The evaluation should include an extensive stakeholder outreach and input process prior to the formation of a multi-jurisdictional organization.

The issue of ownership will continue after the completion of this report, and it is the County's intent to continue working with their elected officials and other jurisdiction to educate them on these considerations and inform them on a preferred direction.

## Updated Population Projections

### Background

In the Phase 1 Report, JRMA used 2010 census data to make projections for the future population increases in Clark County by 2040. Since then, the 2020 census data was released and JRMA updated its numbers to reflect the change. The 2010 census data shows the population of the County at 425,363 and projected it would grow to 488,500 by 2019. The new 2020 census data shows the population size of Clark County at 503,211 in 2020. This is an 18.3% increase in population size since 2010. Based on this information, OFM projects that by 2040 Clark County will have a population of 720,128, a 43.1% increase from the 2020 population. This data is used for forecasting how much waste may be generated in the coming years, and to ensure Clark County is prepared with well-equipped transfer stations that have the capacity to support the growing needs of the County.

**Table 1** presents the updated population projections for the County based on the 2020 census as forecasted by OFM. It includes the projection of reach for the cities and the unincorporated portions of the County.

**Table 1: Clark County Population Projections**

| Clark County Population Projections | | | | | |
|---|---|---|---|---|---|
| City or Area | 2010 Census | 2020 Census | % Increase | 2040 | 2020 to 2040 % Increase |
| Battle Ground | 17,571 | 20,743 | 18.05% | 29,698 | 43.2% |
| Camas | 19,355 | 26,065 | 34.67% | 37,712 | 44.7% |
| La Center | 2,800 | 3,424 | 22.29% | 5,060 | 47.8% |
| Ridgefield | 4,763 | 10,325 | 116.78% | 16,716 | 61.9% |
| Vancouver | 161,791 | 190,915 | 18.00% | 272,837 | 42.9% |
| Washougal | 14,095 | 17,039 | 20.89% | 24,140 | 41.7% |
| Woodland (part) | 0 | 84 | | 119 | 42.0% |
| Yacolt | 1,566 | 1,668 | 6.51% | 2,344 | 40.5% |
| **Incorporated Clark County:** | **221,941** | **270,263** | **21.77%** | **388,625** | **43.8%** |
| **% Incorporated:** | 52.2% | 53.7% | 2.91% | 54.0% | 0.5% |
| **Unincorporated Clark County:** | **203,422** | **233,048** | **14.56%** | **331,503** | **42.2%** |
| **% Unincorporated:** | 47.8% | 46.3% | -3.18% | 46.0% | -0.6% |
| **Clark County:** | **425,363** | **503,311** | **18.33%** | **720,128** | **43.1%** |

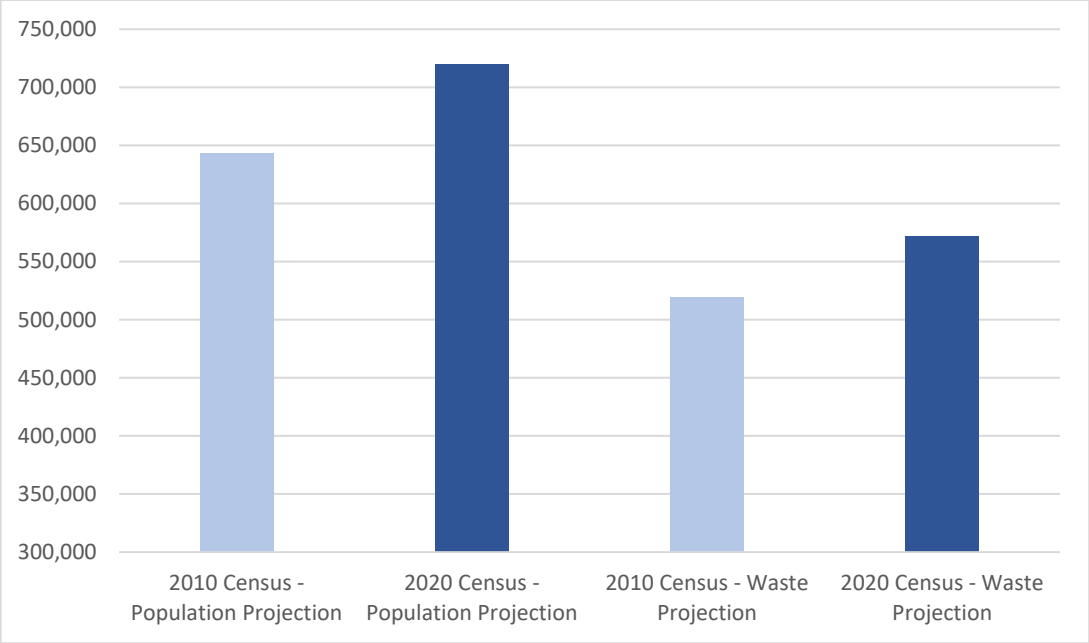
*Source: Washington State - Office of Financial Management, Forecasting and Research Division*

The population data was then used to update the projections of waste generated by each jurisdiction shown in **Table 2** on the next page. The projections are made by assuming each person generates on average 1,587 pounds of waste annually based on 2021 data. This generation rate was arrived at by considering past data. **Table 2** shows the estimated amount of waste that might be generated by each jurisdiction by 2040.

**Table 2: Clark County – Municipal Solid Waste (MSW) Projections**

| Clark County – MSW Projections | | | |
|---|---|---|---|
| **City or Area** | **2021** | **2040** | **% Increase** |
| Battle Ground | 16,790 | 23,565 | 28.7% |
| Camas | 21,321 | 29,924 | 28.7% |
| La Center | 2,861 | 4,015 | 28.7% |
| Ridgefield | 9,451 | 13,264 | 28.7% |
| Vancouver | 154,256 | 216,497 | 28.7% |
| Washougal | 13,648 | 19,155 | 28.7% |
| Woodland (part) | 67 | 95 | 28.7% |
| Yacolt | 1,325 | 1,860 | 28.7% |
| **Incorporated Clark County:** | 219,720 | 308,374 | 28.7% |
| **% Incorporated:** | 54.0% | 54.0% | 0.0% |
| **Unincorporated Clark County:** | 187,484 | 263,048 | 28.7% |
| **% Unincorporated:** | 46.0% | 46.0% | 0.0% |
| **Clark County:** | **407,204** | **571,422** | **28.7%** |
| ***Note:*** *Projected Waste Generation Rate - 1,587 pounds/capita /yr.* | | | |

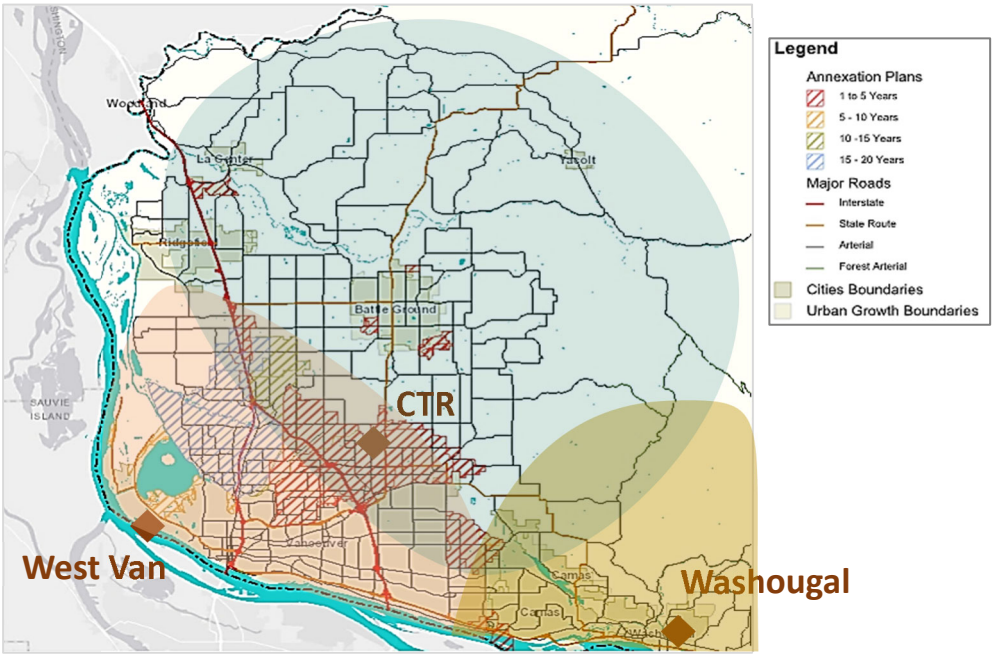
**Figure 1: 2010 and 2020 Census Data Population and Waste for 2040 Projections**




As shown in **Figure 1**, using the 2020 census, the population in 2040 is projected to be 12% higher or about 77,000 more than the previous projection. Consequently, the amount of waste generated is estimated to be more than previously forecasted in Phase 1.

A key to ensuring the necessary infrastructure and capacity to manage this future growth is to determine how the increase will impact the current transfer station system. In the Phase 1 RSWSS, an assessment was completed to demonstrate areas where growth is expected to occur to estimate impacts to the volume of waste received at each facility. The assessment used the County's growth management plan to prepare a map of the services areas for each station shown in **Figure 2**. These service areas are shown as circles and the crossed hatched areas are where the largest growth is expected to occur. As population increases in these assumed service areas one cannot predict precisely where collection trucks will take waste or what facility self-haulers will take their waste. Typically, customers will base their decisions on the driving time.

**Figure 2: Map of County with Annexation**




Based on the County's growth management plan, a large portion of the growth is expected in the central and northern cities of Ridgefield and Battle Ground. **Table 3** on the next page was prepared for estimating the amount of waste that each transfer station may receive. Much of the growth is expected in the urban growth boundary as shown in the crossed hatched areas. To provide a range of these future waste projections it is assumed that between 50% and 70% of the growth will impact the north services area or what might be received CTR. The difference largely would use West Van. Growth in the eastern part of the County serviced by Washougal is expected to be the same under either assumption.

**Table 3: Estimated Transfer Station Service Area Waste Projections**

| Transfer Station Service Area | Assuming 50% UGB Growth in Central Area | | | Assuming 70% UGB Growth in Central Area | | |
|---|---|---|---|---|---|---|
| | Population | % Change of Waste | Additional Waste (TPY) | Population | % Change of Waste | Additional Waste (TPY) |
| **Service Areas** | | | | | | |
| *Growth in City of Vancouver in North/Central County* | 40,961 | | 41,780 | 57,706 | | 58,860 |
| *Growth in Unincorporated North/Central County* | 49,227 | | 50,212 | 49,227 | | 50,212 |
| *Growth in North Cities* | 26,968 | | 27,507 | 26,968 | | 27,507 |
| **CTR Service Area:** | **117,156** | **54%** | **88,734** | **133,901** | **62%** | **101,416** |
| *Growth in City of Vancouver (25% of City & County)* | 20,840 | | 21,257 | 20,480 | | 20,890 |
| *Growth in unincorporated East County – Assume 20%* | 19,112 | | 19,494 | 19,112 | | 19,494 |
| *Growth in East Cities* | 18,748 | | 19,123 | 18,748 | | 19,123 |
| **Washougal Service Area:** | **58,700** | **27%** | **44,459** | **58,340** | **27%** | **44,187** |
| **West Van Service Area:** | **40,961** | **19%** | **31,024** | **24,576** | **11%** | **18,614** |
| ***Total:*** | **216,817** | **100.0%** | **164,217** | **216,817** | **100%** | **164,217** |

As shown above, the additional amount of waste expected to be received at CTR over the next 20 years may vary from 88,000 tons per year to more than 101,000 tons. Likewise, the additional waste to be received at West Van would inversely vary from a high of 31,000 tons to 18,000 tons per year with Washougal expected to experience about 44,000 tons more per year. In planning for the future capacity of each facility it is desirable to consider the worst-case scenario. **Table 4** below uses the service area assumptions presented in **Table 3** above to identify the worst-case scenario for how much waste may be received at each transfer station.

**Table 4: Estimated Transfer Station Demand**

| Transfer Station Service Area | Estimated Transfer Station Capacity Analysis | |
|---|---|---|
| | Existing 2021 TPY | Projected Worse Case 2040 TPY |
| **CTR Service Area** | **251,847** | **353,263** |
| **Washougal Service Area** | **38,638** | **83,097** |
| **West Van Service Area** | **116,719** | **147,743** |
| **Total:** | **407,204** | **584,103** |

It is understood that these are the best guesses at predicting what amount would be delivered to each transfer station as there are many factors that influence a decision on which facility to travel. The travel time for each customer and/or changes in collection practices and routes can change the location where customers will deliver waste. However, flexibility to handle variability in the amount of waste is considered in the master planning process.

**Summary of Population and Waste Flow Projections**

The population and corresponding waste projections have been updated from the Phase 1 RSWSS considering the impact of the new 2020 census results. OFM continues to review this data annually and therefore it is subject to change. However, this new data is the basis for projecting the amount of waste to be

received and managed by the transfer station and recycling facilities. Keeping in mind the existing facilities are currently receiving significantly more customers and waste quantities than they were designed for and that no major improvements have been made since 1993. The master plans must address deficiencies in current operations as well as ensure there is capacity to manage the future waste generated in the service areas. This updated data will be the basis for preparing the master site plans to make improvements and expansions at each facility to provide safe, reliable, and cost-effective services for the next 20 years or longer.

## Phase 2 Report - Update Regional Facilities Plans

### Introduction

The Phase 1 transfer station assessments and needs and opportunities review resulted in developing preliminary facility plans for both CTR and Washougal. Regarding West Van, it was recommended a master plan be prepared once a decision on the future MRF has been made. Based on the stated intent of the services provider (CRC) and the County, it is assumed the MRF will be relocated to a new facility in five years. Thus, the West Van Master Plan is included in this Phase 2 RSWSS Report.

Since completion of the Phase 1 RSWSS in October 2021, a full evaluation of alternatives for serving the north service area has not been completed. Considering that further evaluation of the north service alternatives is necessary, the Phase 1 facility plans have been updated to provide information for deciding on which option should be recommended. For Phase 2, each facility has been re-evaluated considering updated waste projections.

Other factors that will impact the plans to implement improvements include the status of negotiations between the County and CRC. This includes continued discussions about the future ownership options.

### Organics Management

The other factor that will impact future operations will be developing the infrastructure necessary to manage organics. In March 2022, the State of Washington passed HB 1799 that directs local jurisdictions to reduce organic materials disposed in landfills by 75% before 2030 and widely expand collection programs. Organic material includes food waste, yard debris, and wood.

Starting in 2024, businesses with at least eight cubic yards of weekly organic material will be required to have on-site management or collection service in place. By 2027, local governments will also have to offer collection service for organic waste generated by businesses.

Residential collection will be required on January 1, 2027 for every-other week or at least 26 weeks a year. These collection requirments will apply to Vancouver and the areas in County just north of Vancouver. Other areas are exempt from the requirments.

In 2021, the County generated 407,204 tons of MSW. Based on a waste composition study prepared for the City of Tacoma (2014) food waste represents about 20% of MSW. This data indicates the County may have discarded as much as 80,000 tons of food waste in 2021. If 75% is removed, the County would need to find an alternative for 60,000 tons of food waste. The City of Vancouver offers a voluntary commercial food waste collection program that collects approximatly 1,500 tons annually and any County resident that has yard debris service may also add food waste to their yard debris bin. There was also a little over 18,000 tons of source separated yard debris collected in 2021 at the transfer stations. The sum of the two material catigories (60,000+18,000) represent an approximate 78,000 ton opportunity for the County.

The facilities plan anticiaptes providing space for the management of organics at all three transfer stations. The assumptions are that the County in the near term will continue to use composting as its prefered method of processing yard waste and mixed organics. The designs will also provide flexibility in the event that method were to change.

Further evalaution of the feasibility of alternatives for implementing best management practices and implementing the most cost effective strategy for handling orgaincs is needed. As such it is recommended that the County and its partners complete a feasibility study to determine a course of action for meeting the goals established under HB 1799. This includes considering both collections servcies for organics, processing and technologies to convert organics into renewable energy and/or new products.

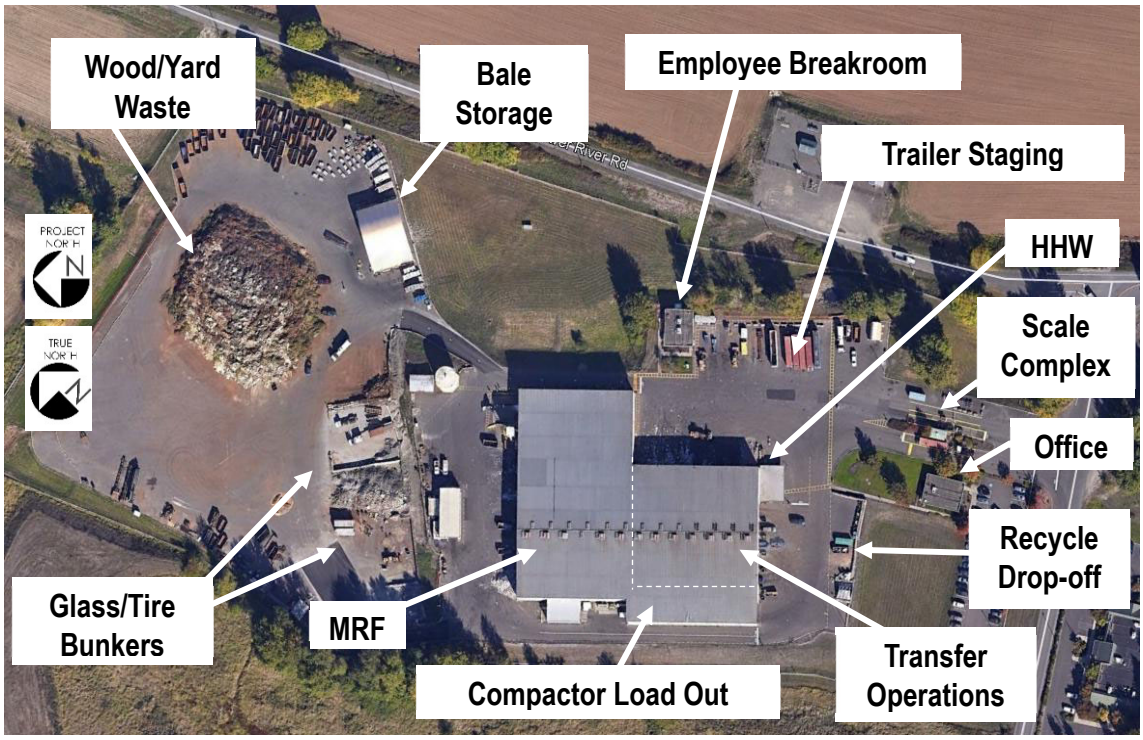
## West Vancouver Materials Recovery Center (West Van)

### Introduction

West Van is located on a 21+ acre site off Old Lower River Road at the Port of Vancouver as depicted in **Figure 3** below. It was constructed in 1993 to receive MSW from commercial collection trucks and self-haul customers. MSW is loaded into containers that are shuttled half a mile to a barge loading facility located on the Columbia River. Waste is then barged more than 200 miles to the Finley Buttes Regional Landfill in Boardman, Oregon.

The property includes a large 91,100 square foot (sf) pre-engineered metal building (PEMB) that receives waste from self-haul customers and WCW collection trucks from residential and commercial accounts. The transfer operations occupy 46,000 sf of the structure while the MRF receiving and processing operations use the remaining 45,100 sf.

**Figure 3: West Vancouver Materials Recovery Center**




In addition to the transfer station and MRF operations, West Van provides approximately seven acres on the north side of the site for managing other waste streams. This includes space for receiving and processing yard debris and wood waste and dedicated bunkers to receive mixed glass and inert waste such as concrete and rock deposits. Tires are also received and temporarily stored before being transferred for processing. It also provides supplemental storage for baled materials in a canopied area and for parking rolling stock and container storage. These operations are performed outdoors except for the bale storage that is stored under canopies.

### Summary of Phase 1 RSWSS – Assessment

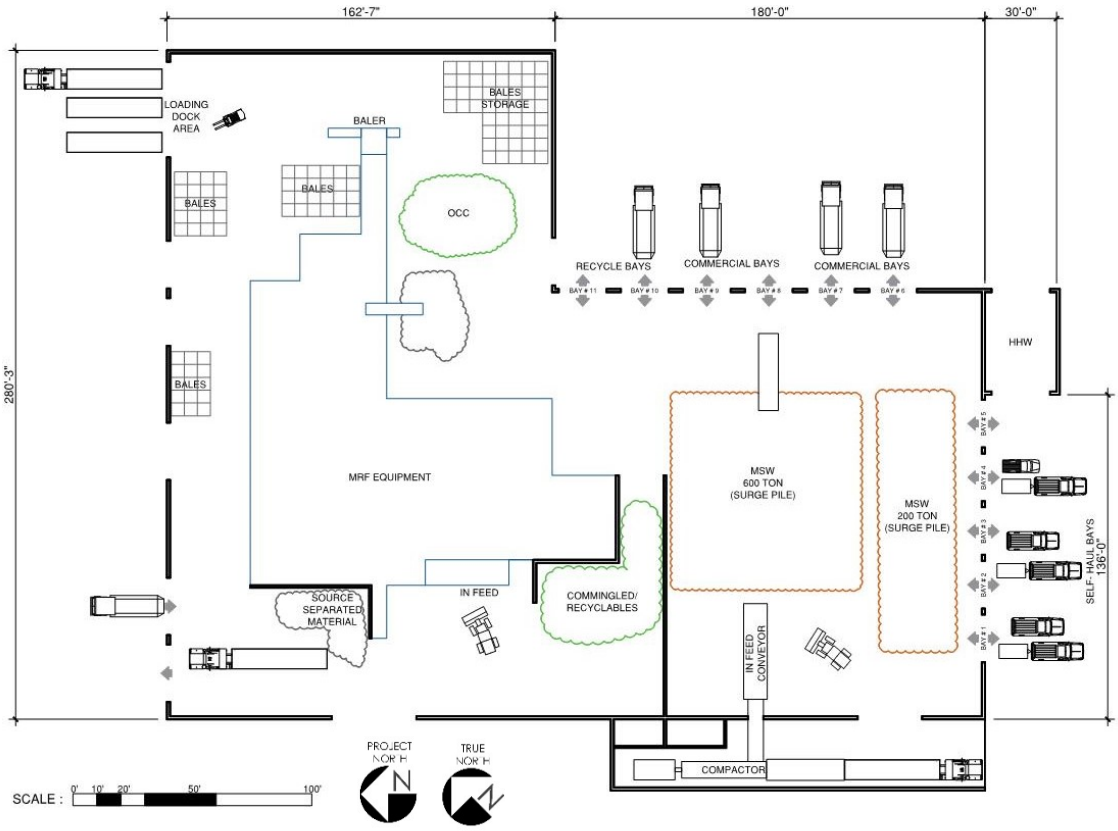
<u>Existing Tip Floor Operations</u>

Since the facility was constructed in 1993 there has been no major expansion to the transfer station tip floor area. CRC has replaced the original compactor in recent years. When the facility was first opened the total amount of waste generated in the County was 173,000 tons per year (TPY) or about 600 tons per day (TPD). In 2021 the transfer station system received over 400,000 TPY or roughly about 1,400 TPD. In 2021, West Van

received over 116,000 tons of waste or roughly 30% of all waste generated in the County. The percentage of waste received at West Van has remained fairly constant over the past six years. Assuming West Van continues to receive a similar percentage of the total waste generated, by 2040 the total waste delivered to West Van is estimated to be about 150,000 TPY or 600 TPD under peak periods.This is consistent with the service area analysis presented previously.

The current tip floor arrangement shown in **Figure 4** demonstrates that the facility does have sufficient space to receive and temporarily store 400 TPD. However, the amount of space needed is dependent on the load out capacity or time needed to remove all waste from the tip floor. A single compactor can load a container/trailer with 30 tons of waste in about 25 minutes or about 60 tons per hour (TPH). The amount of waste for each container could be more or less than 30 tons depending on the materials being loaded. It takes between eight to ten hours of continuous loading operations to remove 600 tons, and does not include interruptions in services whether it be equipment downtime or availability of containers to load. Also, West Van has no contingency if the compactor is out of service for extensive repairs.

**Figure 4: Existing West Van Floor Plan**




Another factor related to the capacity of the transfer station is the number of stalls available for customers to unload. As shown in **Figure 4** there are currently five-20 feet (ft) roll up doors (referred to as Bays 1-5) located on the south side of the building for self-haul or cash customers to unload. Each door opening may accommodate two self-haul vehicles to unload thus providing 10 stalls to unload. However, the door farthest to the west (Bay 1) is currently dedicated to accepting mixed orgaincs (i.e.food waste and yard debris) collected in both the Cities of Vancouver and Ridgefield and is not available for self-haul customers. Bay 5 is limited for unloading as it must remain unavailable when the household hazardous waste (HHW) is open to accept materials. This leaves only three bays and six stalls that can be used to unload self-haul customers. Based on information in the Phase 1 RSWSS, during peak hours from 9 a.m. to 3 p.m. West Van experiences between 40 and 45 vehicles per hour. On average the typical self-haul customer will use 10 minutes to unload including

the time to back in and exit. This means that a stall can handle five (5) vehicles per hour. With only six stalls available on a consistent basis, the facility can handle on average, 30 vehicles per hour, which is much less than what is needed. The result is that at times traffic will back onto NW Old Lower River Road.

The County is considering opening West Van to self-haul customers on Sundays which may help spread out the current volume. It could also result in more traffic particularly if some of CTR's current customers decide to use West Van. If all doors are dedicated to accepting self-haul customers, it appears there would be 10 stalls available and sufficient to handle the current volume of customers. But changes to the circulation pattern should be considered to assure there is adequate on-site queue space between the scales and the stalls. Futhermore, these conditions contribute to off-site queue issues onto public rigth of way.

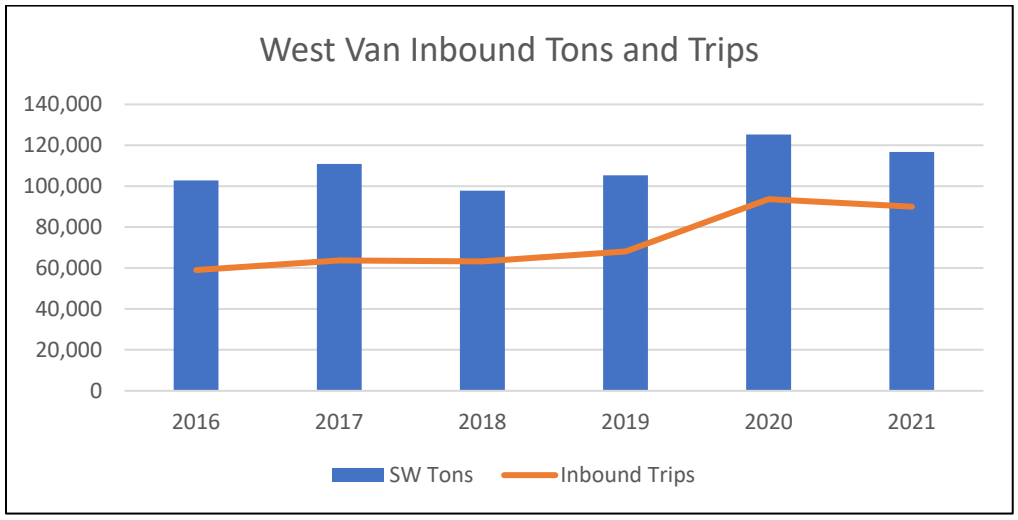
On the east side of the transfer station there are six (6) twenty foot doors (referred to Bays 6-11) for collection trucks to unload. One bay is used for access of the front loader equipment. All compactor and roll off trucks hauling waste use three bays (Bays 7-9) thus providing four to six stalls to unload. These vehicles will unload in approximately five minutes thus, conservatively each bay can receive about eight vehicles per hour. Currently, 50 to 60 collection trucks enter the facility each day with possibly 16 vehicles at peak hours. Thus, a minimum of three stalls are needed to unload.

Bays 10 and 11 are used by trucks with commingled recyclables that serve the entire County. There are about sixty collection trucks with recyclable materials that arrive at West Van five days per week. A few trucks (less than 10) also deliver recyclables on Saturday. As long as the MRF continues to operate at West Van these stalls must remain dedicated to unloading the recycling collection trucks. If the MRF is relocated, then these stalls can be used by other customers.

Waste Quantities and Traffic Counts

Tons received and traffic volume at West Van were updated with 2021 data. **Figure 5** illustrates that both waste received and number of trips to the transfer station declined from 2020, however remain above the previous four years. This data was used to make projections for the Basis of Master Plan recommendations.

**Figure 5: West Van Historic Waste Quantities and Traffic**




Existing Traffic Circulation

Access to the West Van facility is from a local service road used by several local businesses including the barge loading operations to transport waste to the Finley Butte Regional Landfill. The facility entrance is just 200 ft west of NW Old Lower River Road. All traffic entering and exiting the facility uses this one access point as shown in **Figure 6** on the next page.

**Figure 6: West Van Entrance and Scale Complex**


When entering the site all traffic is directed to a single scalehouse complex that has three inbound and two outbound lanes. All inbound customers must use a single lane with a scale to weigh in. CRC recently installed a second scale dedicated to allowing commercial collection trucks to use a separate lane to weigh in. The third lane is a bypass lane used by transfer trailers and commodity trucks to enter the facility without being weighed. The commodity trucks are used to ship recycled materials to markets.

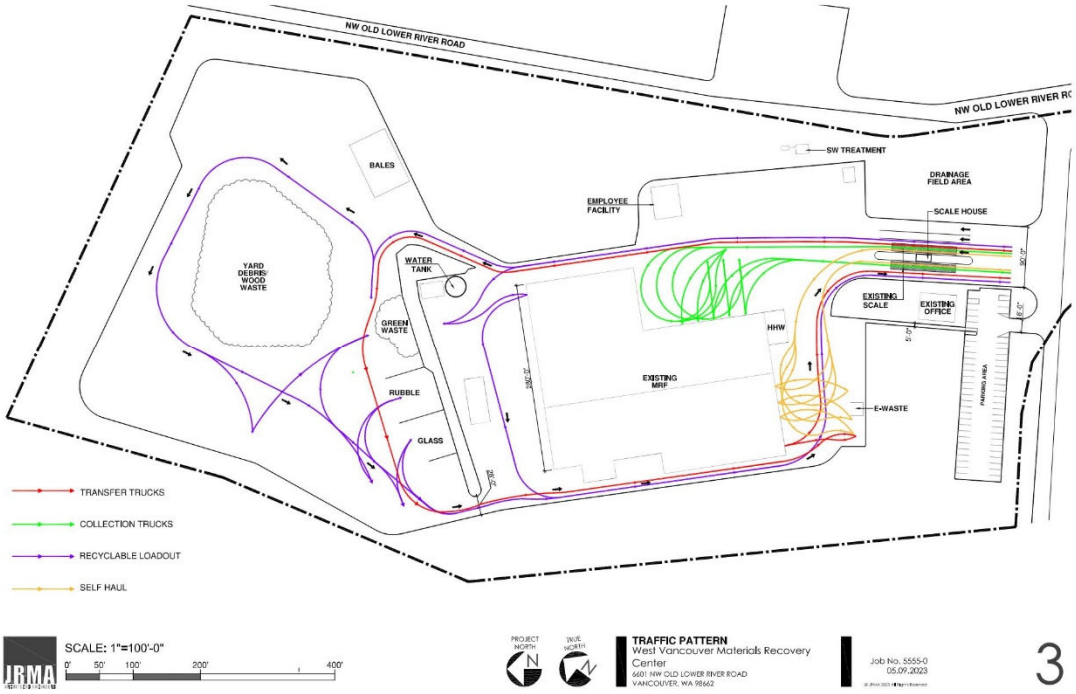
After weighing in at the scale complex, self-haul customers are directed to turn left where they queue up for an available stall to unload at the transfer station. Self-haul customers can also access either or both the recycling drop off and the HHW facility when it is open. WCW collection trucks will enter the same access lane and proceed to unload on the east side of the transfer station and MRF.

Currently, traffic can back up off the service road and onto Old Lower River Road. Since this road has very little through traffic it does not create a significant congestion problem at the intersection for through traffic, but it is not a desirable conditon. When traffic does back onto public right of way, transfer trucks delivering waste from CTR to the barge loading facilites are impacted. Since 60% of the waste generated in the County is received at CTR this off-site queue directly impacts loading operations at that facility. The new scale serving the commercial trucks may help to relieve the potential for backup onto the Old Lower River Road.

All traffic including self-haul customers, collection trucks, transfer trailers, and commodity trucks must exit at this same entrance. Vehicles that need to weigh out use the outbound scale lane while other vehicles needing not to weigh out can use the bypass lane and must cross through the outbound scale traffic.

Site circulation for the various customers using the facilities has evolved over the many years of operation as new services and programs have been adopted. **Figure 7** on the next page captures the complexity of their traffic patterns. The site circulation near the entrance is quite congested at times. This is a result of the close proximity of the entrance to the main transfer station building and where vehicles unload. It is further complicated due to the location of the HHW and the recycle drop off area.

**Figure 7: West Van Traffic Patterns**




In Phase 1 RSWSS a conditions assessment was conducted in 2019. From this review it was determined there were no immediate facility deficiencies to be addressed other than to improve circulation. The main transfer station and MRF structure were determined to be in good condition. However, many of the support structures were constructed in the 1990s and may be obsolete or in need of major renovation in the longer term. It was recommended that a site Master Facilities Plan be prepared to consider what improvements were needed to existing facilities and what modifications and expansions were needed to address long term solid waste services for the regional system.

Since this assessment there have several new developments that need to be considered in preparing a master plan as follows:

1. The 2020 census data reveals the population in Clark County is higher than previous data and projections.
2. The number of self-haul stalls for unloading will need to be increased. The number of cash customers using the facility has increased significantly in the last two years. In 2021 the number of cash customers increased from 68,000 in 2019 to about 90,000, an increase of 22,000 vehicles (shown in **Figure 5**).
3. The State recently passed HB 1799 requiring local governments to reduce the amount of food waste being disposed of in landfills by 2030.
4. The current food/yard waste collection programs in the City of Vancouver continue to grow and the City of Ridgefield has also started a similar program. This will require more space to be dedicated to handling food waste and/or mixed organics.
5. The County, Vancouver and CRC need to evaluate relocating the MRF to another site to increase room for organics management.
6. The City and County are considering public ownership options for the regional transfer station system.
7. The City has extended water service to this area. Assuming the facility can connect to provide water service, the existing well and pump system can be replaced and relocated.

These new developments need to be included in updating the operational assessment and considered in preparing facilities plan for addressing the long-term service needs of the solid waste system.

In summary, all customer traffic and transfer activities relying on a single point of ingress and egress causes bottlenecks and congestion that impact the site circulation and detracts from operating most efficiently. CRC employees attend to monitoring the conditions to route customers safely while on-site. With growth in the service area, circulation problems will only be exacerbated. Also, the HHW and recycle drop off area should be reconfigured to improve services. This will be even more urgent if and when the MRF is relocated.

**Basis of Master Plan for Facility Improvements**

Based on the findings from Phase 1 RSWSS and the recently passed HB 1799, the design data in the following **Table 5** is recommended to be the basis of the West Van Master Plan.

**Table 5: West Van - Basis of Master Plan Design Data**

| Category | | Existing | 2040 Projection | % Change |
|---|---|---|---|---|
| **Waste Quantities (MSW)** | | | | |
| Annual | Tons | 116,719 | 150,000 | 29% |
| Ave Daily | Tons | 400 | 550 | 38% |
| Peak Daily | Tons | 450 | 600 | 33% |
| **Customer Trips** | | | | |
| WCW | | | | |
| All Commercial | Annual | 25,428 | 33,000 | 30% |
| | Daily | 110 | 127 | 15% |
| | MSW | 50 | 65 | 30% |
| | Recycle | 60 | 75 | 25% |
| Self-Haul/Cash | Annual | 64,554 | 96,000 | 49% |
| | Daily | 227 | 350 | 54% |
| **Organics** | | **Tons/Year** | **Tons/Year** | |
| Yard Waste | | | | |
| | County | 5,514 | 7,200 | 31% |
| | Metro* | 11,800 | N/A | |
| Wood | | | | |
| | County | 5,465 | 7,100 | 30% |
| | Metro* | 245 | | |
| Mixed Organics | | | | |
| | Source Separated | 1,416 | 1,840 | 30% |
| Food Waste – MSW | | | | |
| | Vegetative | 13% 15,173 | 22,230 | 47% |
| | Other | 8% 9,200 | 13,700 | 49% |
| | | 24,373 | 35,930 | 47% |
| **Total Organics** | | | | |
| | Source Separated | 12,395 | 16,140 | 30% |
| | MSW + SS | 36,768 | 52,070 | 42% |

*Material that originates from the Portland Metro region

Organics Management

West Van received 24,000 tons of yard debris and wood waste in 2021. Of this total 11,800 tons were reported to be received from Portland Metro. Therefore, only 11,200 tons of these organic materials were collected in the County. The facility also received almost 1,500 tons of mixed organics (yard debris with food waste) collected from residences in the cities of vancouver and Ridgefield and source separated commercial food waste. These organics must be received in inside the transfer station. The commercial food waste collect program is voluntary. Residental food waste is processed with yard debris collection. A waste characterization study of yard debris has not been conducted by the County but this collection method traditionally accounts for about 5% of the yard debris weight in other communities. These materials are reloaded and then transported to the Dirt Huggers Compost Facilty near Dallesport, Washington. As mentioned, the State recently passed HB 1799. One component of the West Van Master Plan will be to design options for managing organics in response to this new legislation. This could include construction of organics processing that can be used as a reload center for organics being processed for compost or enough spacing to hande preprocessing equipment for perhaps an aerarted static pile compost system (ASP) or anarobic digestion (AD) on or off-site. Traditionally, post consumer commercial food waste is highly contaminated. Both composters and operators of anarobic facilities desire material that is low in contamination so this waste stream presents issues and will require processing to remove contaminants.. A feasability study should be conducted to establish the best option for processing organic material at West Van that emphasises the highest and best use as well as producing a feedstock that has high market demand.

Near Term Issues

1. A critical need is to establish a location and facilities needed for top loading operations. An immediate need is to have capabilities to top load food waste/mixed organics.
2. Develop plans to reduce congestion and eliminate offsite queue issues.
    a. Consider adding a new access for transfer trailers/containers off Old Lower River Road.
    b. Consider a new exit road for containers being shuttled to the barge facility.
3. Extend the City of Vancouver waterline to provide water service and replace the current ground water pump and tank system used for fire suspresion.
4. Conduct a feasibility study to research options for processing organics material at the station including relocating the MRF.
5. Consider the location for the second compactor.

Longer Term Issues

The West Van facility is located on 21 acres. The back seven acres are currently used for receiving and processing yard debris and wood waste. It also includes a bale storage structure and container/bin storage and other support activities. The County should consider how this space can best be used to provide waste management and recycling services in the future.

Also, the MRF processing operations are expected to be relocated to a new facility. Once the equipment line is removed the space can possibly used for other services. Options may include:

1. Receive and process construction and demolition (C&D) materials.
2. Process organics, including food waste, green waste, and wood waste.
3. Other operations as deemed necessary for providing waste management and recycling services. This should include:
    a. Provide a location onsite for an expanded recycle drop off for self-haul customers.

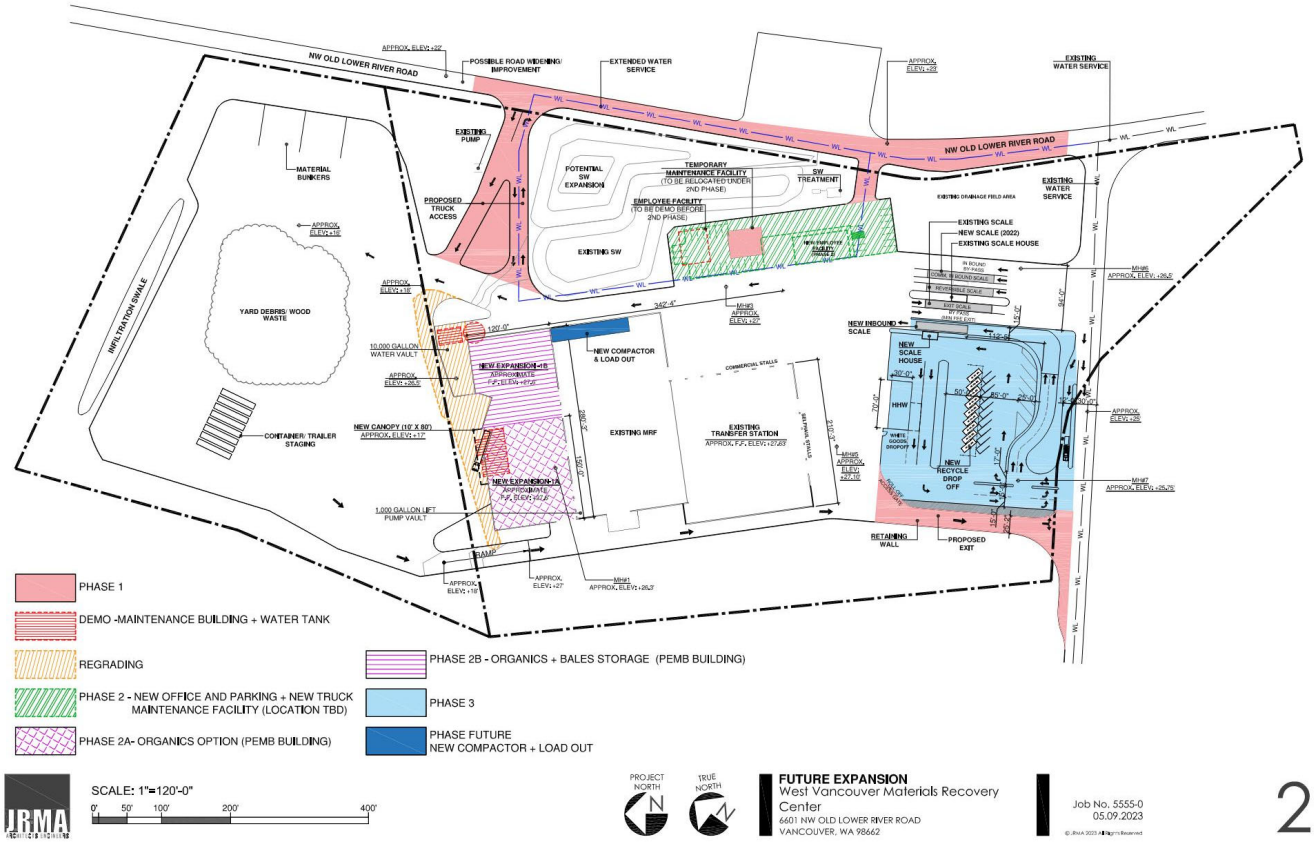
b. Provide a new location for a HHW to alleviate the conflicts with self-haul customers unloading at the transfer station.

c. Recovery of materials from other waste streams such as self-haul or targeted commercial loads

**Description of Improvements of Master Plan**

The Facility Plan includes a Basis of Master Plan design for West Van. It takes into consideration the conditions and operations assessment from Phase 1 and the updated waste flow projections. The plan was developed considering that certain improvements can be implemented in the near term while space is provided for making future longer-term improvements. The plan is presented as a phased development plan that also considers the importance of maintaining operations while construction of improvements is being made.

**Figure 8: West Van Site Plan**




Phase 1

These improvements are designed to eliminate congestion and site circulation problems with the current operations. They are also consistent with providing longer-term improvements for expanding operations.

1. Add a new commercial route truck entrance and exit NW Old Lower River Road.
2. Add a new staff entrance to future new office.
3. Temporarily relocate the maintenance facility next to the employee facility.
4. Add a separate exit for transfer trucks going onto the private access road to the Tidewater Barge dock.
5. Add a new water line to service the property for fire and domestic uses.
6. Remove the existing water tank and maintenance facility.

7. Regrade the area near the existing maintenance facility.

And Phase 2A

1. Construct a new mixed organics receiving, and top load out bay off the existing MRF with partial enclosure to capture fugitive debris.
2. Collect runoff water in existing or expanded water vault system for treatment.

Phase 2B (Optional)

1. Expand mixed organics receiving and top load out bay and add bale storage.
2. Runoff collected from the organics area will be stored in existing or upgraded vaults.

Phase 2

1. Construct a new office facility and parking area.
2. Build a permanent maintenance facility (location TBD).

Phase 3

1. Build a new HHW and public recycling area.
2. Add a new public entrance and new scale option for public customers.

Phase 4

1. Using the previous commodities load dock area reconfigure the space to install a second compactor load out. Alternative locations can be evaluated.

**Estimated Construction Cost for West Van Capital Improvements**

The West Van master plan identifies specific improvements to upgrade current facilities to meet immediate needs. It also recognizes that once the MRF is relocated there is a large, enclosed building space (approximately 45,000 sf) that can be repurposed for future operations and new services. The improvements represent preliminary design concepts requiring final programming and design development prior to producing construction documents.

Construction cost estimates were made for each phase of the capital improvements for the West Van Transfer and Recycling Facility. These estimates are based on construction costs for specific items from projects completed in Clark County or similar projects in the Pacific Northwest in 2023. The cost estimates represent a “Class 3 planning level” cost estimate meaning it carries a variance range of plus 30% to minus 20%.

**Table 6: Construction Cost Estimate – Capital Improvement Plan**

| West Van Transfer Station Construction Cost Estimates | |
|---|---|
| **New Access Improvements (Phase 1)**<br>Description:<br>1. Expand NW Lower River Rd to provide separate access for transfer trailers and exit for collection trucks.<br>2. Construct a new south access ramp direct to the private road to the barge facilities.<br>3. Regrade the backyard to accept new traffic pattern as needed.<br>4. Address long term improvements to stormwater management system. | **$1,400,000** |
| **Site Improvements (Phase 1)**<br>Description:<br>1. Extend the city water line to replace the current well and tank system for fire protection.<br>2. Construct a grade separation/wall system to provide for new top load stations.<br>3. Relocate rolling stock maintenance facility (temporary location). | **$2,000,000** |
| **Option 2A – Building Expansion – Organics Load Out / Bale Storage**<br>Includes:<br>1. Construction PEMB (120'x150') and canopy (10'x80') for top load station to be used for organics load out. | **$3,600,000** |
| **Option 2B – Building Expansion Option – Organics Top Load + Bale Storage (2A)**<br>Description:<br>1. Construct a larger PEMB (120'x280') to provide organics load out and covered bale storage.<br>2. NOTE: This option is dependent on timeline to relocate MRF. | **$6,700,000** |
| **New Employee Center (Phase 2)**<br>Description:<br>1. Construct new office and employee center with adequate employee parking and associated utilities. | **$2,200,000** |
| **Recycle Drop Off and HHW (Phase 3)**<br>Description:<br>1. Build new and expanded recycle and HHW drop off facility. Update scale configuration to provide adequate onsite queue and safe circulation of self-haul customers. | **$3,000,000** |
| **Total All Phases – Option 2A** | **$12,200,000** |
| **Total All Phases – Option 2B** | **$15,300,000** |
| **CIP Budget** | **$15,300,000** |

**Recommended Implementation Schedule**

The County should **proceed with construction of Phase 1 and 2 of the West Van improvements in the next three years.** These projects will improve on-site circulation, minimize congestion at the gatehouse and help alleviate off-site queue issues. The top load for organics load out (Option 2A) can be completed subsequent to the site improvements. However, a final decision on the expansion should be assessed in

conjunction with the evaluation of the option and estimated schedule to relocate the MRF. If this equipment is removed in the next four years, the current space occupied by the equipment may be repurposed for managing organics and the building expansion may not be necessary as conceived in the master plan.

The construction schedule is presented in the CIP section of this report.

## Central Transfer and Recycling (CTR)

### Introduction

CTR is located on State Highway 503 in central Clark County near Brush Prairie. It serves the largest area of the County and is the area projected to have the most growth over the next 20 years.

**Figure 9: Current CTR Site Plan**


The facility resides on an irregularly shaped parcel of land and includes three main structures that make up the facility operations. The solid waste transfer station is the main structure. There is also a combined recycling building and HHW building, and an administrative and operations office building. The facility was originally constructed circa the 1970s. In 1991, a new 38,000 sf transfer station was added to replace the original transfer building. MSW is loaded into containers that are shuttled 13 miles to a barge loading facility located at the Port of Vancouver on the Columbia River near West Van. Waste is then barged more than 200 miles to the Finley Buttes Regional Landfill in Boardman, Oregon. In addition to managing the area's waste, CRC operates a recycling and HHW waste drop-off center. **Figure 9** above provides an aerial photo of the site operations.

The original transfer station building was expanded and converted to the recycling and HHW building. An automatic scale system for route trucks was installed in 2012.

### Summary of Phase 1 RSWSS – Assessment

<u>Conditions Assessment</u>

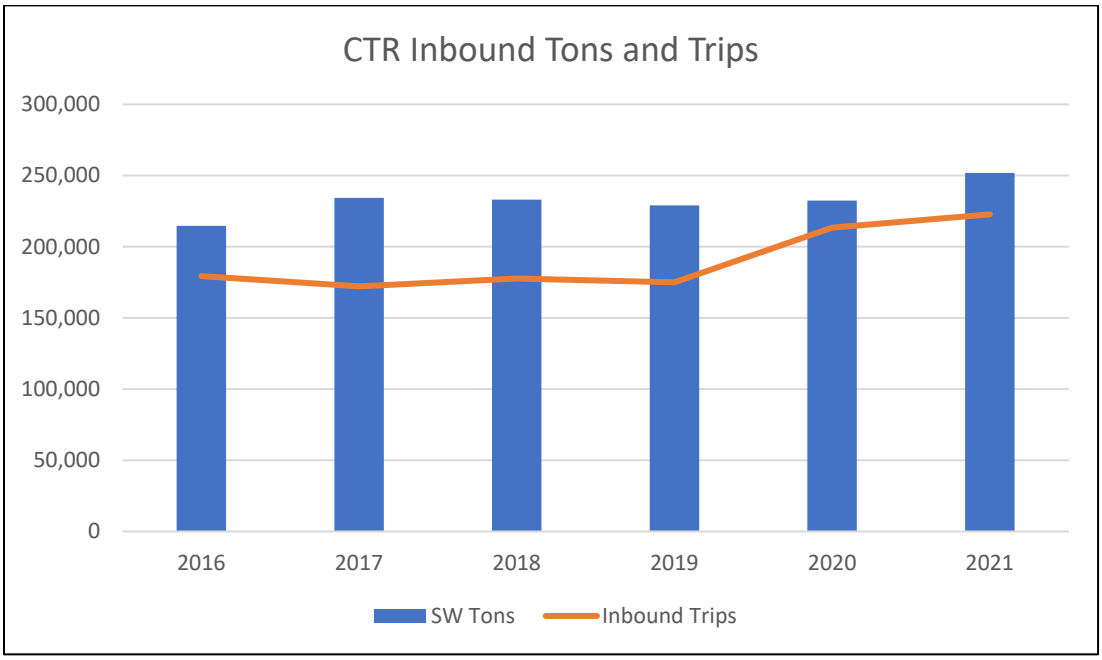
The limited structural and site improvement condition assessment reveals that most of the assets at the site are in fair to good condition, except for the recycling building, paved areas east of the boundary retaining wall, and the infiltration portion of the stormwater system. The complete report is included as Appendix B, *Conditions Assessment* in the Phase 1 RSWSS Report.

Structural and civil condition assessments were limited to those areas that are readily accessible and visible to the field staff. Concealed conditions that become exposed in the future may change our current recommendations.

Waste Quantities and Traffic Counts

Tons received and traffic volume at CTR were updated with 2021 data. **Figure 10** illustrates that both waste received and traffic on-site continue to grow at CTR. This data was used to make projections for the Basis of Master Plan recommendations.

**Figure 10: CTR Inbound Tons and Trips**




Site Circulation and Unloading Stall Capacity

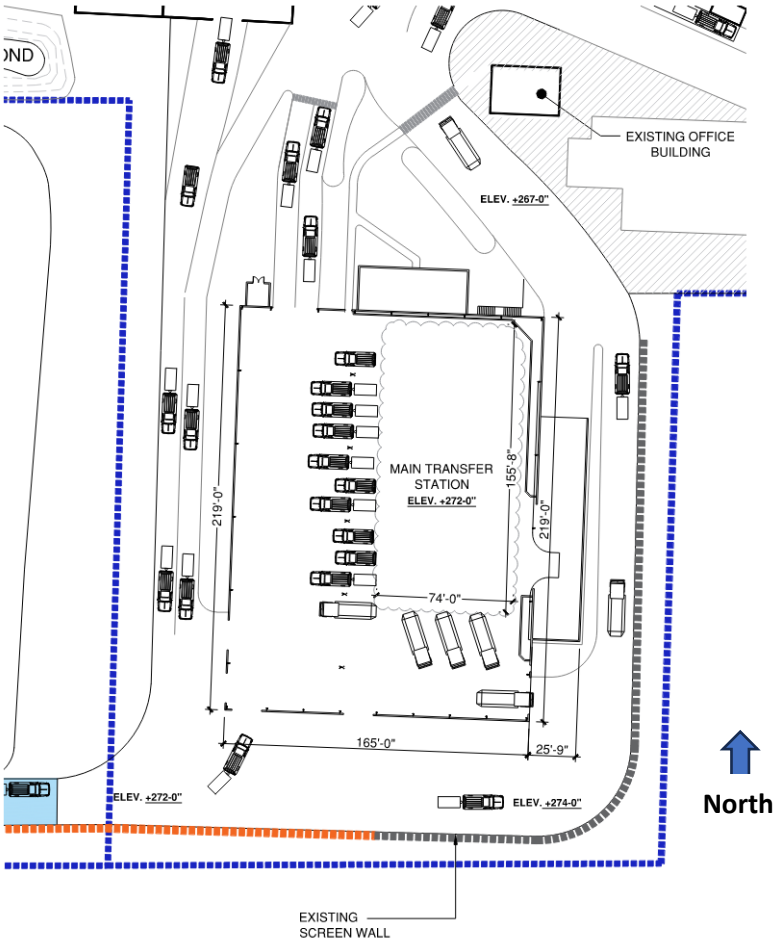
When CTR was constructed in 1991, it was not designed to accommodate the current levels of traffic, or the different activities and services currently provided.

Daily traffic at CTR averages 50 to 60 vehicles per hour. An unloading stall is expected to handle six vehicles per hour, giving 10 minutes per vehicle to maneuver into the stall, unload, and exit. Some vehicles, such as cars and pickups with less waste, will unload faster. However, vehicles with trailers and those with hydraulic tippers typically take longer. Therefore, in non-peak times, 10 to 12 stalls are sufficient for unloading.

During peak times, customer traffic can increase from 80 to as many as 100 vehicles per hour. At this volume, the facility would need to dedicate a minimum of 13 stalls for unloading during peak weekday times and 17 to 20 stalls during peak weekend times. **Figure 11** on the next page shows the tipping floor and vehicle unloading capacity (north is the left side of the figure). With the two northernmost stalls dedicated to source-separated cardboard, green waste, and clean wood (red circled area), there are only 11 stalls for unloading waste. On weekends, CTR can use the south drive aisle to route vehicles to unload. After unloading, these vehicles will exit the southeast door (blue circle) and drive to the outbound scale (green circle).

Also depicted in **Figure 12** is how transfer trucks, when loaded, exit the facility. The truck and trailer must intersect with other outbound traffic and will need to access the scale.

**Figure 11: Tipping Floor Capacity**




CRC does a good job managing traffic and ensuring vehicles can safely unload in the transfer station. Spotters are located at the entrance and on the tipping floor to guide customers to the appropriate stalls. Although the current facility does not have enough stalls to unload quickly during peak times, there is space for customers to queue onsite before entering the transfer station. However, when exiting the transfer station from the southeast door, there is approximately 550 ft before the outbound scale, queue space for 20 to 22 vehicles. Routing vehicles in this direction can reduce the traffic queue exiting the transfer station. However, there is only one scale dedicated to processing all outbound customers and to weighing out transfer trucks.

The amount of customer traffic on weekends and during peak seasons also impacts the overall site circulation. The primary place of congestion is the outbound lanes before the scales. As shown on the site circulation map in **Figure 12**, all traffic must converge on two lanes including transfer trucks loaded with containers bound for the Tidewater loading dock.

**Figure 12: CTR Site Circulation**


Outbound traffic conditions may be improved by decreasing the time to process customers; however, the physical space for vehicles to line up to be weighed out as well as those to use the bypass lane is very limited. If the station is to make improvements to eliminate the off-site queue, it would also be desirable to consider modifications to remedy both the outbound scale capacity issues and the site circulation restrictions.

Impacts of Growth Management in CTR Service Area

Clark County has grown about 2% per year since 2010 (approximately 78,000 people from 2010 to 2020), and based on recent data from OFM, it is expected to continue at this rate for the next 20 years. The central and northern portions of the County, served by CTR, are expected to experience most of this growth, as predicted in the Growth Management Plan. The updated waste projections show that projected growth for this area could result in more than 100,000 tons of additional waste being generated per year in the next 20 years.

Growth has resulted in increased development of adjacent properties around CTR. The apartment complex on the northside of CTR has expanded, and now sits within 15 ft of the north retaining wall. Property on the west side of 112$^{th}$ street has been developed with new single-family houses. On the south side of the transfer station, a storage unit facility and private school were recently constructed. CRC owns eight acres located on the west side of CTR, providing a buffer between the new residential development and the transfer station. A new scale complex designed to eliminate off-site queueing problems is proposed by CRC for this property. These recent changes in the development of adjacent properties will need to be considered in deciding future changes to operations and future facility improvements.

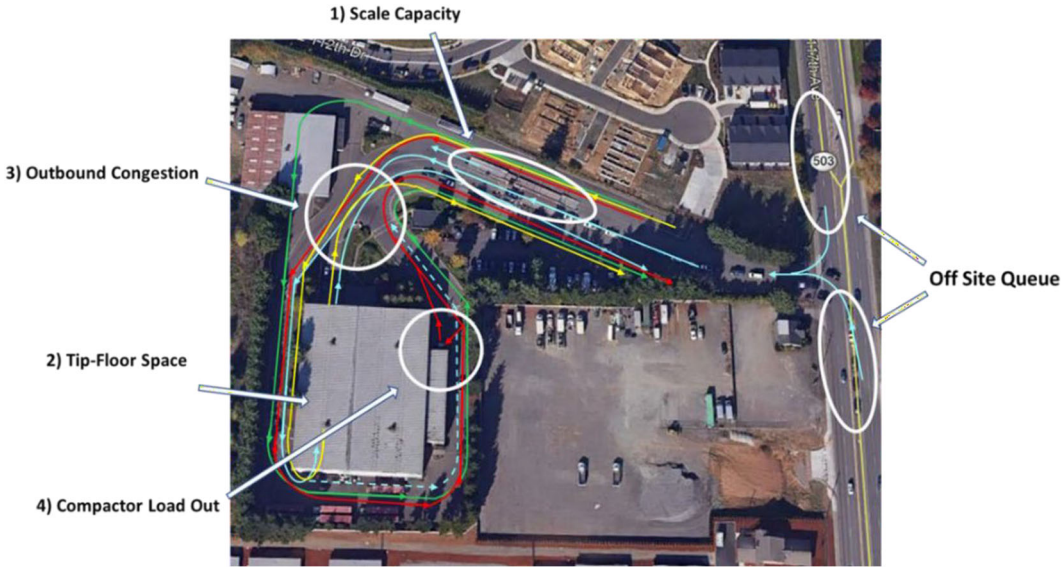
CTR continues to experience increases in total waste volumes and the number of customers using the facility. The following is updated data that shows the increase over the past two years. Also, CTR is the only transfer station open on Sundays and therefore must serve the entire County. The traffic on weekends may be impacted if the County decides to expand the hours of operations at the Washougal and West Van transfer stations.

Considering the increase in volume and number of self-haul customers, CTR is currently at operating capacity. This operating capacity is based on current waste quantities and hours of operation at about 900 TPD. If the waste exceeds the capacity, CRC will process the waste to ensure it is removed from the tip floor and not stored overnight. There were several observed deficiencies during the consultant team's site visits and review of data. It is important to understand that these deficiencies are a result of the physical conditions and limitations of the original design to handle the increase in customers and waste volume experienced over the past 30 years. CRC executes day-to-day operations to manage the current waste streams and traffic in a safe and efficient manner, given these physical constraints.

Based on the assessment of current operations, the following site constraints and deficiencies were noted (as shown in **Figure 13**).

1. **Scale Capacity:** CRC is considering adding a second in-bound scale to increase thequeuing for in-bound traffic.
2. **Tipping Floor Space:** The current facility does not have sufficient space for vehicles to unload and limited space to handle surges in waste volumes.
3. **Congestion at Exit Lanes:** All traffic exiting the site must make a left turn into two outbound lanes. Transfer trucks are subjected to a hairpin-like turn and therefore use both lanes to access one outbound scale. The competition for the outbound scale and exiting is not a desirable condition and is exacerbated by the increase in waste quantities and increase in self-haul traffic.
4. **Compactor Load-Out Capacity:** With the current operating hours (12 per day), the compactor can only loud out about 900 TPD. CTR averages between 800 and 900 TPD. There are some days during peak periods where CTR receives between 900 and 1,100 tons. CRC reported that on occasions when waste of more than this capacity is received, they will load this material into trailers/containers to ensure it is not stored overnight.

**Figure 13: CTR Operations Assessment**




**Summary of Phase 1 CTR Conditions and Recommended Improvements**

The CTR was not designed to handle the current waste volume and traffic conditions. The demand for services has increased greatly, particularly in the past five years. CTR is centrally located, has been well-maintained, and is in relatively good condition. There are improvements that can be made to not only deal with the current off-site queue, but also to improve overall site circulation and enhance the material handling needs. Changes could include expanding the transfer station building to provide space for unloading and floor storage. The additional areas would provide space for unloading C&D waste for processing that could divert this material from the landfill. Added space to handle green waste and wood could also contribute to higher material recovery. The key question to address is what level of investment should be made at CTR in conjunction with other regional service needs.

The answer to this question remains to be determined. In Phase 1 RSWSS, Chapter 5 – North Area Service Options presented what facilities are needed to serve this area. In Chapter 5, four options were developed.

Drawings for those can be found in Appendix A of the RSWSS. The report identified two short-term improvements and settled on Option 1.

The most immediate need identified in the system was to make improvements at CTR to address safe ingress and egress off Hwy. 503. The first step was to modify the entrance to allow for two separate lanes entering the facility. This improvement was completed in 2022 and there are no left turns permitted when exiting the station. Now all vehicles exiting CTR can only turn right and travel south on Hwy. 503. Customers originating from north of CTR, such as Battle Ground, Ridgefield, La Center, and Yacolt must find a route to return to the north county.

The second improvement recommends extending the inbound lane to the back of the site and installing a new scale. The lane would extend to the south side and ramp up to the existing transfer station as shown. It would provide the added queue space needed to eliminate any vehicles from queuing off-site onto the highway. This would allow customers to travel a much longer entrance road to a new scale for weighing in. The perimeter screening would also be extended to mitigate visual impacts to adjacent properties.

**Basis of Master Plan for Facility Improvements**

Based on the findings from Phase 1 RSWSS and the recently passed HB 1799, the updated design data in the following **Table 7** is recommended to be the basis of the CTR plan. This Basis of Master Plan considers that new census data and waste quantities received have resutled in new projections.

**Table 7: CTR - Basis of Master Plan Design Data (Updated per 2020 Census)**

| Category | | Existing Transfer Station | Future (20 Years) |
|---|---|---|---|
| **Building Space** | | | |
| | | 38,000 sf - 36,136 excl. loadout | Space need defined by criteria |
| **Waste Quantities** | | | |
| Annual | Tons | 251,847 | 353,263 |
| Average | Tons/Day | 900 | 1,200 |
| Peak | Tons/Day | 1,100 | 1,400 |
| **Traffic/Unloading Capacity** | | | |
| Commercial | Ave Per Day | 100 | 130 |
| | Ave Per Hour | 25 | 30 |
| Commercial Stall | | 4 to 5 | 5 |
| Self-Haul Weekday | Peak | 600 | 780 |
| | Per Hour | 70 | 90 |
| Weekday Stalls | | 14 | 18 |
| Self-Haul Weekend | Per Hour | 100 | 130 |
| Weekend Stalls | | 20 | 26 |
| *Assumes 1 stall is 5 cars an hour | - | - | - |
| **Operating Space** | | | |
| Available area to stack waste, handle surge, and load trailers. Excludes maneuvering and stall for unloading | | | |

| | | | |
|---|---|---|---|
| Need | | 13,000 sf | 18,000 sf (1 day storage + 10% operations) |
| Available | | 11,000 sf | |
| Average | | 900 TPD | 1,200 TPD |
| | | 30 ton payload | |
| | | 30 trailer loads | |
| | | 25 minutes 12.5 hours* | 16 hours @ existing |
| Peak | | 1,100 TPD | 1,400 TPD |
| Required load out w/single compactor | | 15 hours* | 20 hours @ existing |
| *Assumes no disruptions | | | |
| **Trailer Parking** | | | |
| | | Space for 4 | Assume 8 trailers for staging |
| | | Minimum 6,000 sf | 12,000 sf |
| **Scale Capacity/Transactions** | | | |
| Inbound - 1 - SH scale | | 80 vehicle/hour | 120 vehicle/hour |
| Outbound - 1 SH scale shared with transfer trailers | | 80 vehicle/hour | 120 vehicle/hour |
| *Note both inbound and outbound scales at 45 seconds/transaction | | - | - |

The data shows it will be necessary to provide a second compactor in the future to allow load out of materials in reasonalbe operating hours. It is also needed to have redundancy in the load out operations.

Organics Management

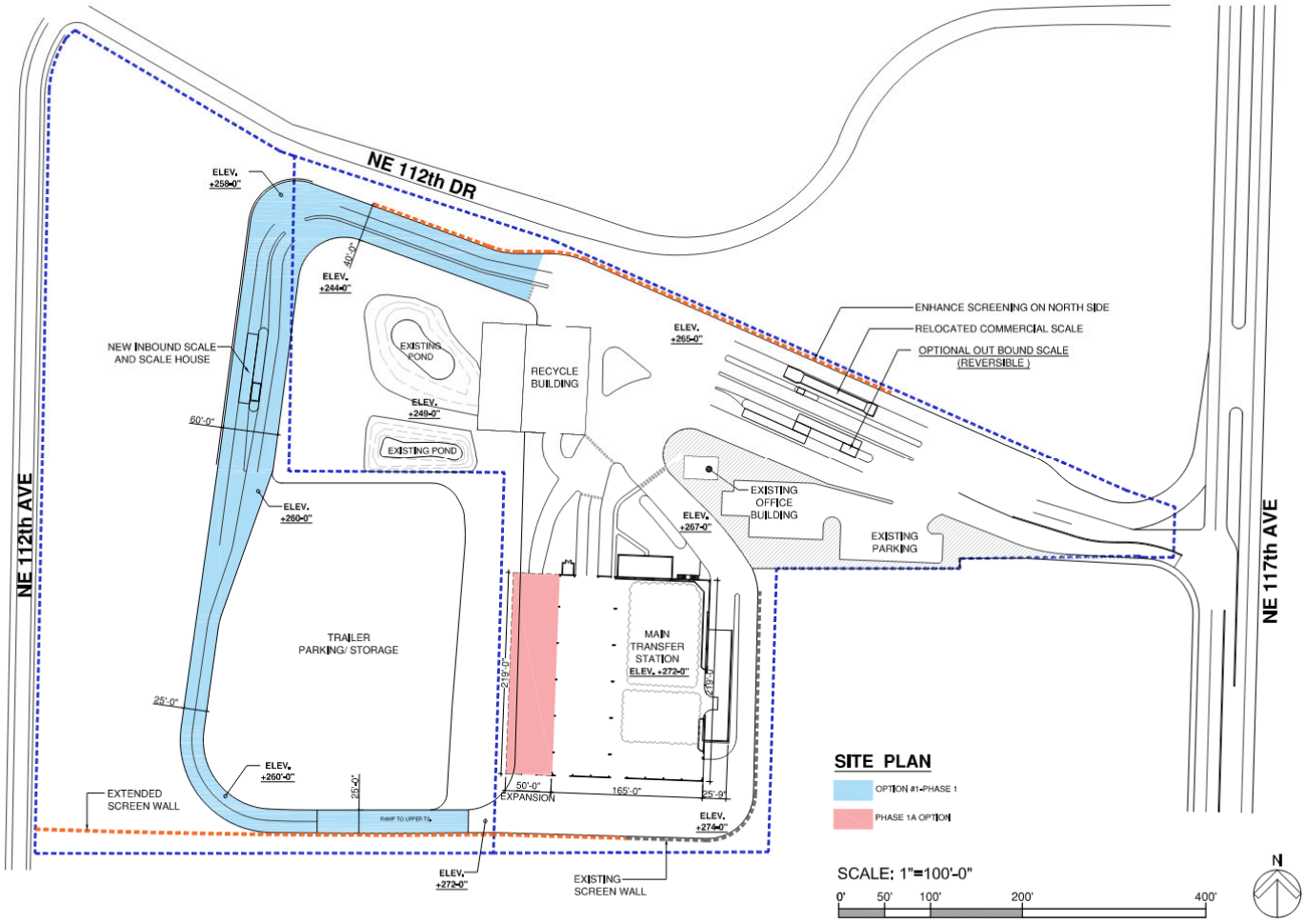
CTR processed approximatly 1,500 tons of yard debris in 2021 and no source seperated commercial food waste. This material is reloaded and sent to Dirt Hugger, a compose facility in Dallesport, WA. With the passed HB 1799, the design for CTR will include the continued collection of yard debris and provide options for expanding reload capacity in the future. The site as currently used is not supportive of any preprocessing options for organic material.

Prior to making any large investments at CTR a decision on which option is best for serving the north/central county should be implemented. However, each of the options will require several years to site and permit. Even after permits are secured final design and construction will require a minimum of two to three years.

**CTR - Phase 1 Improvements**

Given the timeline to decide on the future facilities needed to serve the north service area, improvements at CTR should be implemented to eliminate potential for offsite queueing onto Hwy. 503. Also, the option to expand the existing structure and provide added tip floor space may be beneficial in both the short run and for the long term if Option 1A is selected. See **Figure 14** on the next page.

**Figure 14: CTR Improvement Option**




Phase 1

1. Add two new inbound lanes to a new scale house to increase curing length for vehicles entering the site. The road will extend and wrap around the landfill portion of the site and reduce traffic backing up onto Hwy. 503.
2. Install a new scale (relocated) and scale house in the east portion on the new road improvement.
3. Extend concrete wall along south side of site where improvements have been made.
4. Improve site screening along the north side of the property.

Phase 1A (Optional)

1. Conduct comparative site analysis and expand the transfer station building with a 11,000 sf addition in the event a new station isn't sited or delayed in the North Service Area.

**Table 8: Phase 1 Construction Cost Estimate**

| CTR Construction Cost Estimates | |
|---|---|
| **New Perimeter Road and Gatehouse**<br>Description:<br>1. Site Work<br>2. New Scale and Scale House<br>3. New Access Road | **$3,500,000** |
| **Option 1A – Transfer Station Expansion**<br>Description:<br>1. Demolition and Site Prep<br>2. Optional Outbound Scale House 8'x8' | **$3,000,000** |
| **Total Estimated Construction Cost Excluding Option 1A** | **$3,500,000** |
| **Total Estimated Construction Cost Including Option 1A** | **$6,500,000** |

**CTR - North Service Area Options**

Implementing the construction of the recommended improvements is a priority for the County to mitigate queueing onto public right of way. To address the question of how to best serve the north and central portion of the county, the Phase 1 report evaluated the options for serving the north service area. These three options were compared to the options for making improvements at CTR. The north-central portions of the County are projected to experience the largest percentage of growth over the next 20 years. This growth has resulted in increased waste volumes and traffic at CTR and the need to make investments in facilities to manage the current conditions. However, to improve current deficiencies at CTR and manage future growth in this service area, additional investments in the system will be necessary. Updated projections show an increase in volumes to all County facilities with CTR expected to experience an increase of more than 100,000 TPY or 40% by 2040. The options for meeting the future infrastructure needs of the northcentral County were identified in the Phase 1 report.

The three distinct options identified are summarized as follows:

1. Make major improvements at CTR to address current and future service needs.
2. Make minimal improvements at CTR and site and build a new satellite transfer station to serve the northernmost portion of the County and relieve some of the customer traffic using CTR.
3. Replace CTR with a new transfer station designed to handle future growth. This alternative recognizes the need to minimize impacts to the residential properties adjacent to CTR; it is important that CTR be a good neighbor.

For each option, conceptual facility plans were developed to provide planning level construction cost estimates.

Decisions on a new transfer station and whether to move the MRF to a new location from its current location at West Van have not been made since the Phase 1 report was finalized. There has also been no decision made on the ownership of the facilities, so a summary of each developed option is as follows.

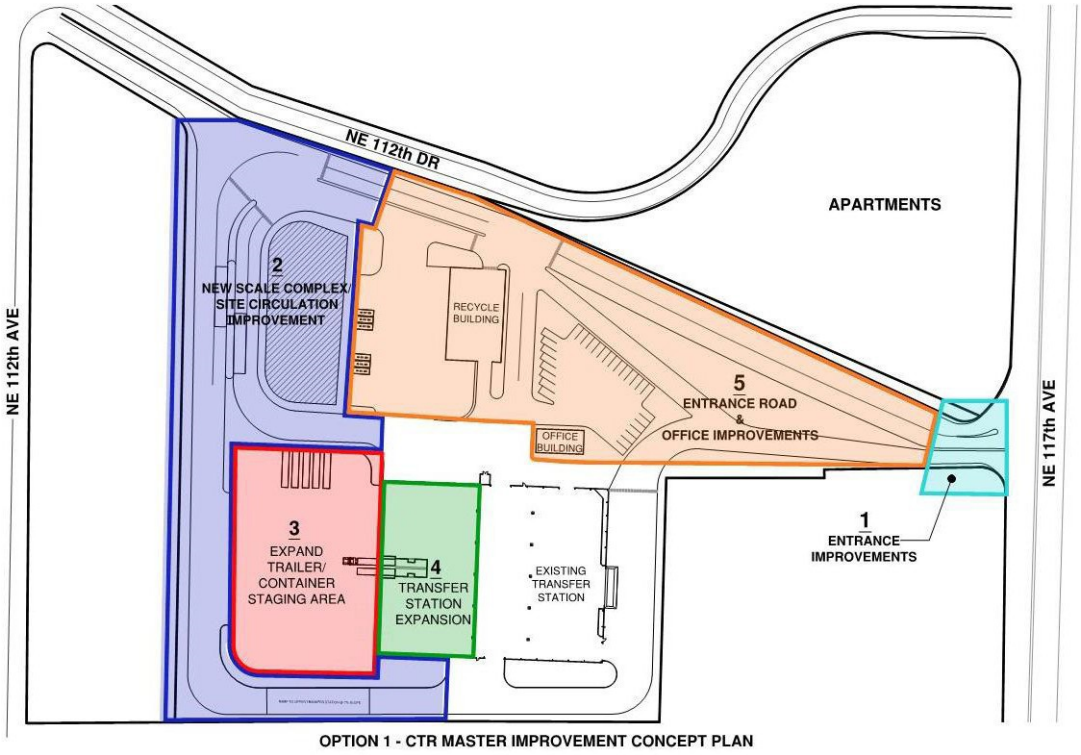
Option 1: Make Major Improvements at CTR to Address Current and Future Service Needs

This option assumes the CTR Transfer Station will make major improvements to address the current operational deficiencies and provide the infrastructure to manage waste resulting from growth in the central and

northern part of the County.  Improvements at CTR will be made to meet capacity needs for the next 25 plus years.

JRMA prepared several concept site plans that incorporate significant improvements to meet the needs of CTR's future conditions. These have been reviewed by the County and CRC and are the basis of the improvements listed; however, more analysis is needed to develop a final site master plan. A primary guiding principle in developing the new site plan has been the need to construct the facilities while maintaining the current operations. Therefore, the intent of the infrastructure improvements is to meet the capacity needs in a phased approach so that the facility can remain open to customers during the construction period. These improvements are captured in **Figure 15** below.

**Figure 15: Option 1 – CTR Improvements**




The option to expand CTR was used in the Phase 1 RSWSS to identify the capital investments needed to address near term deficiencies in current operations and to evaluate the best approach for expanding the facility to meet demands of the north services area. To meet this demand, the facility would require expansion onto the adjacent property owned by CRC. As a result, the report identified several issues that need to be addressed prior to making a final decision on whether to expand CTR.

First, this adjacent property would need to obtain a land use permit to allow the planned expansion. This may also require that a lot line adjustment to enjoin the two properties be approved. Recognizing that the adjacent properties are now zoned for residential and have been developed will need to be considered if CTR is to expand onto adjacent property. In contrast, if a decision was to close CTR and build a new transfer station it also is subject to a siting and permitting process.

Second, the adjacent property is believed to have been part of an old landfill that closed many years ago. This raises questions as to what impacts these conditions may have in redeveloping the adjacent parcel. Further investigation into the subsurface conditions should be completed.

Third, the only access to the facility is off Hwy. 503, a major north/south transportation corridor in the County. The entrance to CTR has been improved to enhance safe ingress and egress by eliminating the left turn for outbound traffic. Also, the Washington Department of Transportation will not permit a traffic signal to be installed. Thus, the site will need to contend with the high traffic volume on a long-term basis with the current entrance. Although certain improvements included in the site plan can relieve queueing onto the public right of way, traffic on Hwy. 503 will increase as the north area of the county grows.

Option 2: Make Minimal Improvements at CTR and Site/Build a New North SatelliteTransfer Station to Accept Primarily Waste from Self-Haul Customers

This option assumed minimal investments at CTR as described in Phase 1 and 1A improvements. The improvements will enhance onsite conditions to handle existing traffic. It recognized that adding any more traffic with access off Hwy. 503 and accepting more waste at CTR as the region grows is less desirable. However, CTR is centrally located and with minimal investments, the facility can handle current traffic more efficiently. **Figure 14** on page 34 depicts the proposed improvements to the existing CTR facility to address the immediate needs.

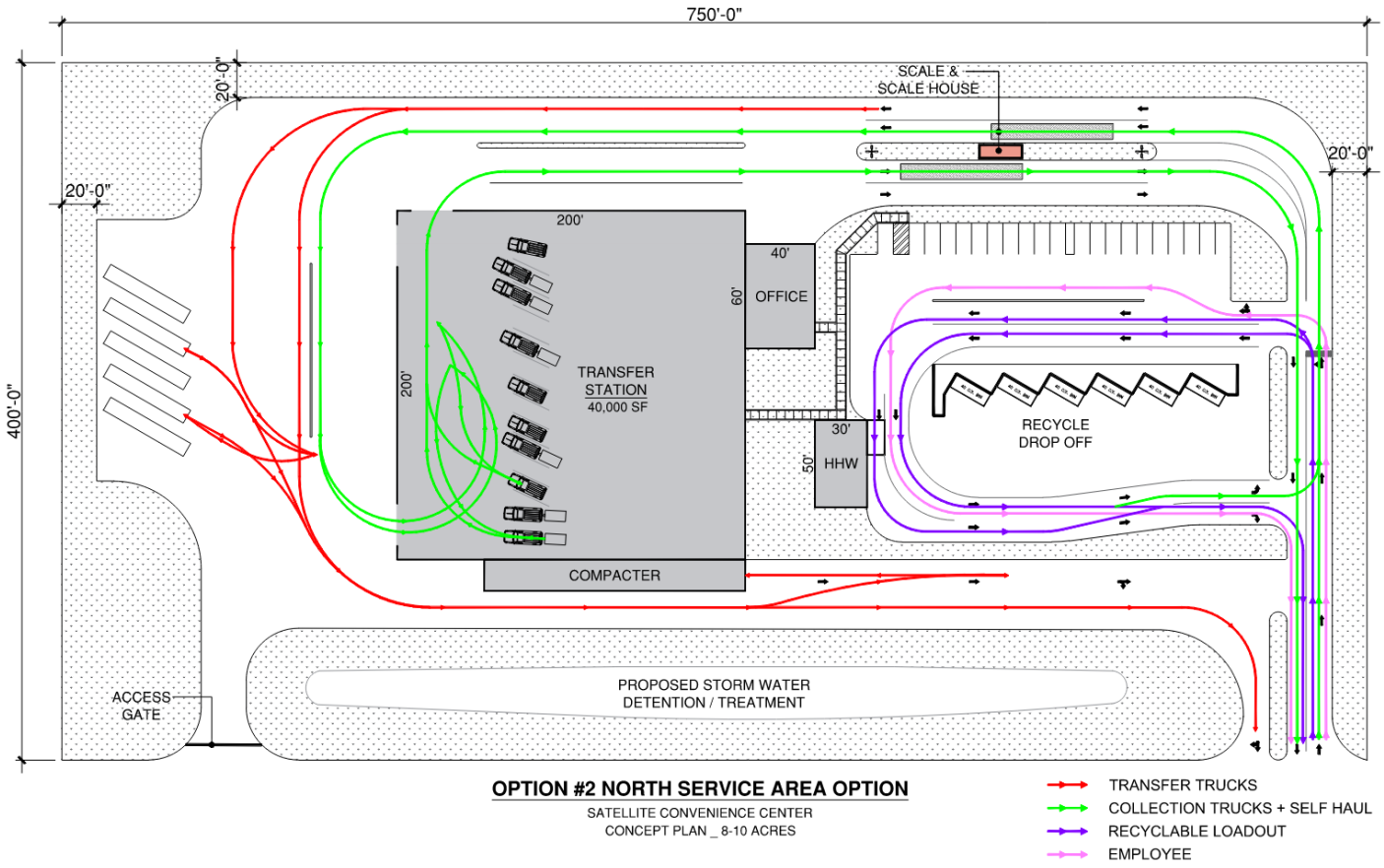
These are minimal improvements to mitigate near-term operating deficiencies, assuming a long-term plan of siting and building a new satellite transfer station /convenience center to serve the north area.

The expanded transfer station would serve to improve overall operations until a satellite station was sited and constructed. Under this approach once the satellite station is operational, CTR would only receive waste from commercial collection trucks. This would positively impact neighbors by reducing traffic since the facility would not receive waste from self-haul customers. Also, impacts on neighboring properties would be greatly reduced on weekends with no self-haul traffic and limited operations. These improvements will mitigate current traffic issues until a new satellite or convenience center is operational.

Option 2 includes siting a satellite transfer station often referred to as a “convenience center” to receive waste from self-haul customers. The new convenience center would be a smaller structure but large enough to ensure capacity to handle future growth. Typically, convenience centers are open seven days per week but the days and hours for operations can vary depending on the local jurisdiction’s policies and practices.

**Figure 16** on the next page shows a concept plan for a typical satellite facility. This concept plan has been updated from the previous plan included in Phase 1. The actual size and site configuration will vary based on local conditions and determined by the desired services to be provided.

**Figure 16: Option 2 – CTR Satellite Station**




Features for a new northern area satellite transfer station may include:

1. A minimum site of six acres of commercial/industrial zoned property is located on a minor arterial road. However, it would be desirable to have seven to ten acres.
2. A new convenience center/transfer station (estimated to be approximately 16,000 to 20,000 sf building) to handle up to 400 TPD.
3. Recycling/HHW drop-off center.
4. Scale complex with one inbound and one outbound scale and gatehouse.
5. Top load trucks from the floor and no compactor.

It would be expected to take a minimum of three years to site and permit the new facility, but this is just an estimate, and permitting a new site could be longer depending on local zoning requirements. This assumes that conducting the siting process with public involvement would take 12 to 18 months. The timeline for zoning approval would be similar (12 to 18 months) considering it would require a conditional use process. Design and construction would occur over two years meaning a new facility may take a minimum of five years before it would be operational.

Benefits of this new north area facility include:

1. Improves onsite queue and circulation issues at CTR.
2. Increases scale capacity and assumes new scale house software to improve transaction times.

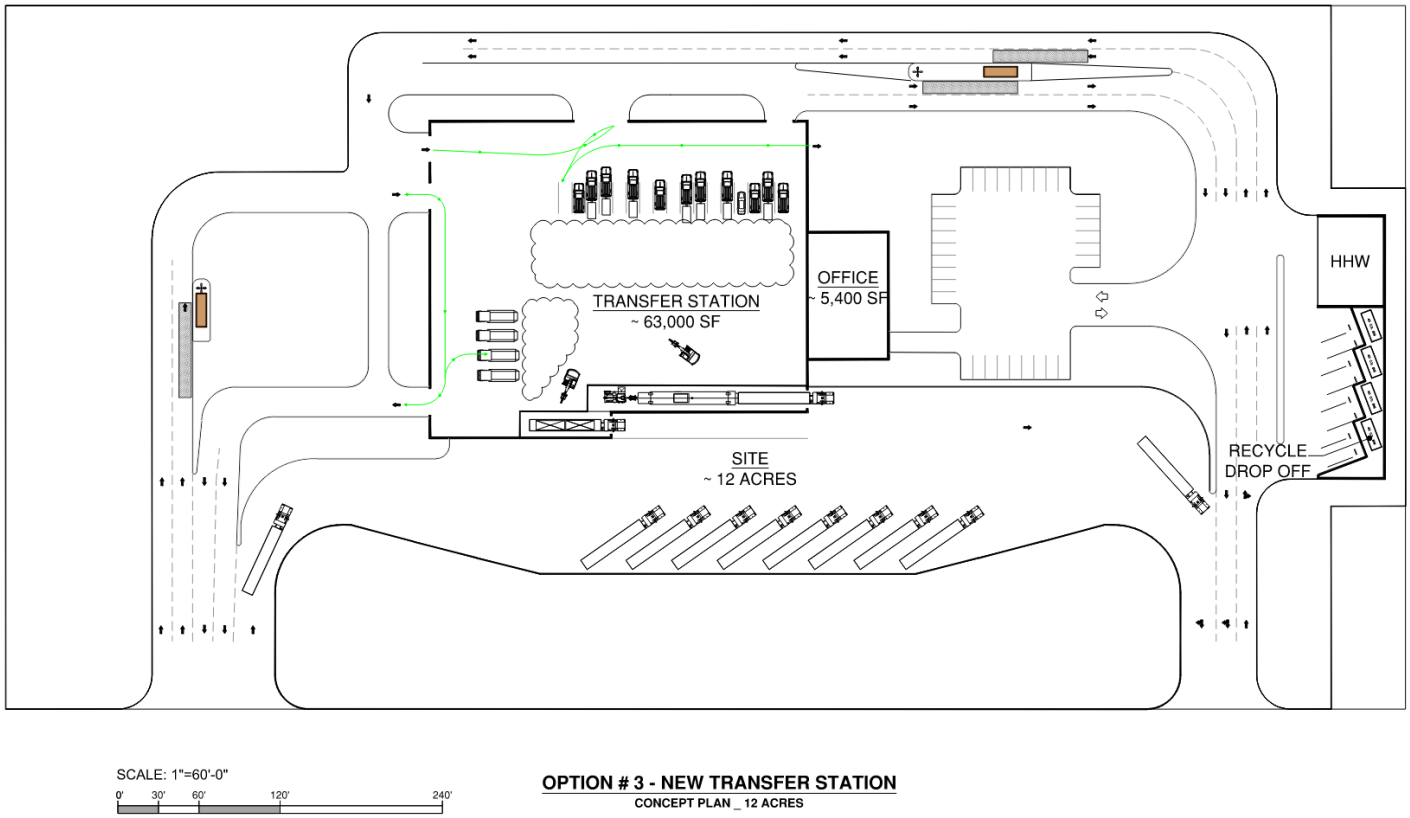
3. Increases space to provide needed stalls for self-haul and cash customers to unload more safely during peak conditions.
4. Provides some separation of self-haul vehicles from WCW collection trucks under peak conditions.
5. May increase needed capacity to loadout waste.
6. Provides additional floor space for flexibility in managing different waste streams.
7. Adds new facility to serve the fastest growing area of the County.
8. Eliminates self-haul customers at CTR which reduces operating hours and days, benefiting neighbors.
9. Reduces overall traffic at CTR and may reduce drive times for self-haul customers when a satellite facility is operational.

Option 3: Replace CTR with New Transfer Station at a New Location

The CTR Transfer Station was not designed to handle the traffic and quantities of waste currently received. Over the past five years, there have been many new developments in the surrounding properties. This includes new residential developments as well as a new school and church. With the expected growth, the County may decide that it may not be the best long-term site to invest in. One option is to make minimal investments in CTR to address immediate operational needs and establish a new location to serve the long term.

To provide future waste management and recycling services, a modern transfer station would be sited and constructed. Ideally, the new station would still be somewhat central to most of the population it serves and be located on commercial /industrial zoned property with access off an arterial or major collector street. It would be located to serve the current service area as well as the growing area of the North County cities. **Figure 17** below shows the proposed concept site plan for a new transfer station to replace CTR.

**Figure 17: Option 3 – New Transfer Station**



The following describes the key features of a new transfer station:

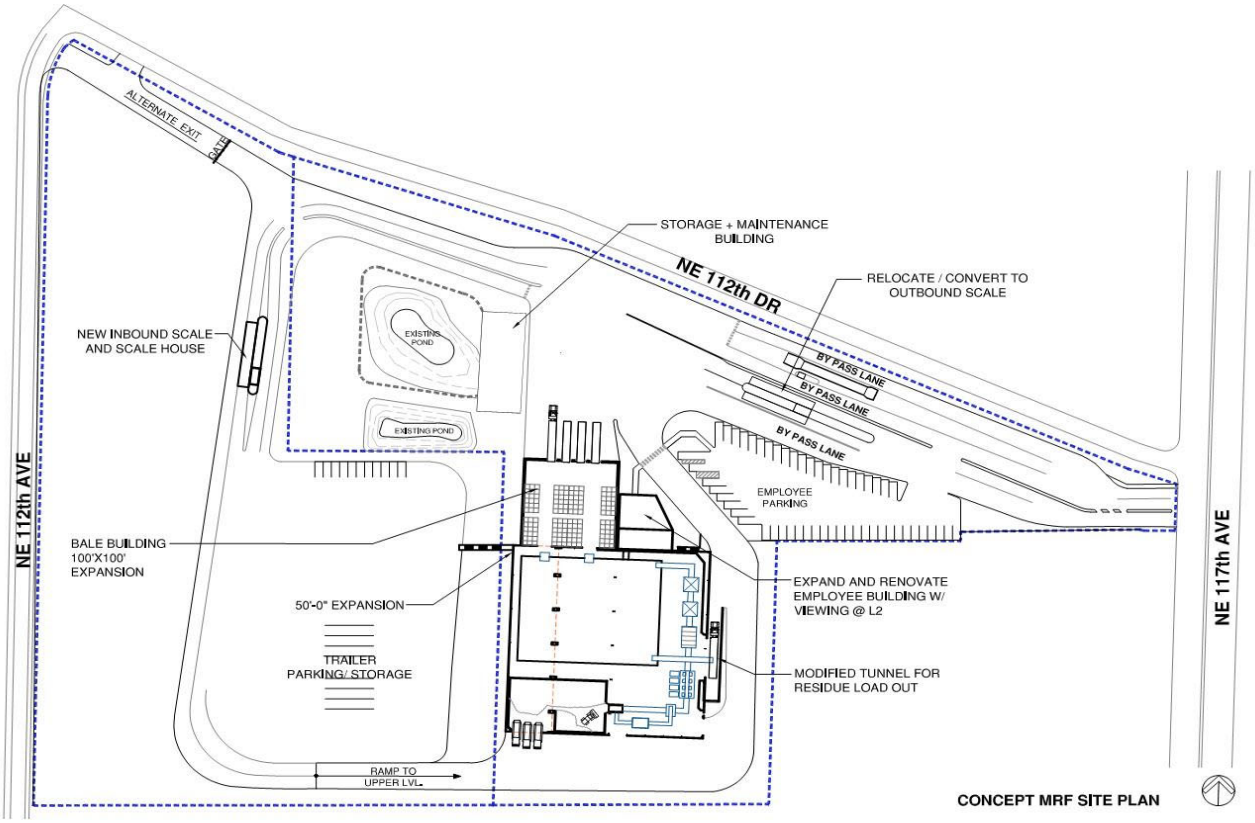
- A minimum site of 12-acres of commercial/industrial zoned property located on a minor arterial road.
- A new transfer station building (approximately 70,000 sf building) to handle up to 1,500 TPD.
- Minimum of two (2) load-out ports equipped with compactors and one top load port to be used as backup and for other materials.
- A recycling/HHW drop-off center.
- Preferably a separate or split access drive for collection trucks to separate from self-haul traffic for safety reasons.
- Separate scales for weighing collection trucks with RFID readers and the capability to weighout vehicles.
- Parking area for staging trailers and containers.
- Office and employee break/restroom and training area.
- Possible education center for tours.

This facility would also incorporate green design features such as natural lighting, recycled-content building materials, water conservation features, renewable energy features, modern odor, and dust control systems.

**Option to Convert CTR into a Materials Recovery Facility**

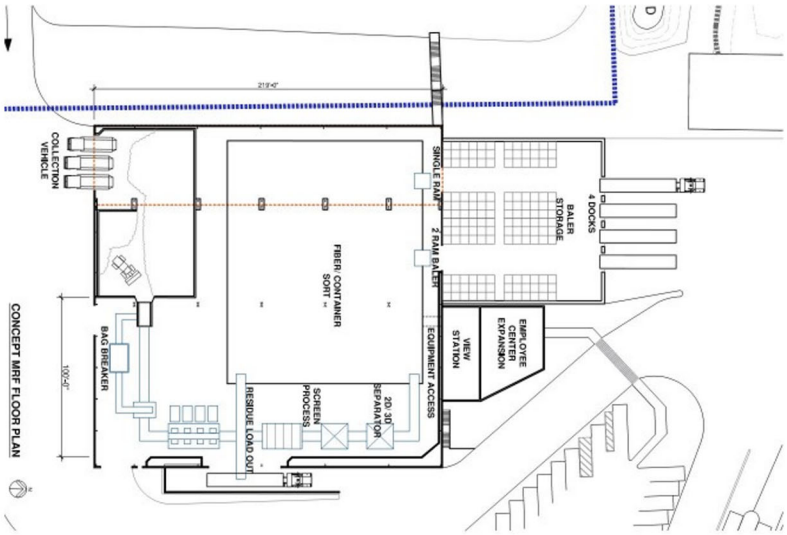
If Option 3 was implemented and CTR was closed to receiving MSW from both commercial collection trucks and self-haul, one option to consider would be to repurpose the facility into a MRF. Re-purposing CTR would result in lower system costs since to site, permit and construct a MRF at a new location would require more capital. **Figure 18** shows a concept for converting CTR to a new MRF.

**Figure 18: Concept MRF Site Plan**




As shown on the conceptual floor plan the primary expenditure to convet CTR would be to expand the struture by adding a bale storage and shipping buildng on the north side.

**Figure 19: Convert CTR to MRF - Floor Plan**



Organics Management for North Service Area

Pending an organics feasibility study, it is recommended that space be allocated for the collection of both yard debris and source seperated commercial food waste for reloading in any proposed facility. In the event of the siting of a full service transfer statation, proper space should be allocated for preprocessing equipment to provide flexibility.

Estiamted Construction Cost for North Service Area Options

Investments in the future needs of CTR beyond Phase 1 and Phase 1A (optional) will need to be made depending on the negoiations with CRC and the County and consideration of options relating to the North Service Area Options. The options for consideration have been described previously. The summary of the three options are:

- Option 1: Make Major Improvements at CTR to Address Current and Future Service Needs.
- Option 2: Make Minimal Improvements at CTR and Site/Build a New North SatelliteTransfer Station to Accept Primarily Waste from Self-Haul Customers.
- Option 3: Replace CTR with New Transfer Station at a New Location.

Option one has some issues that would make it an unlikely choice. At the back of the property is an old inert landfill and stability for building is questionable on this part of the site. There is also a different zoning for the back lot of CTR meaning a conditional use review would be needed to develop it and the neighborhood characteristics have changed since the site was first developed making any expansion much more difficult. It is recommended that the County conduct further evaluation of these options once negotiations are complete. A decision on the MRF could also influence preference for one option over another. With the second two options being the most likely of the three, preliminary costs of those were developed.

North Service Options (New Transfer Station or Satellite Convenience Center)

Construction costs are estimated to be $18M to expand CTR. This does not include the cost for the Phase 1 improvements to add a new perimeter road and scale at CTR of $3.5M. The options to site a new transfer station range from an estimated $25M for a smaller convenience center to $34M for a totally new transfer station to serve the north service area for the next 25 years. It is recommended to proceed with the Phase 1 improvements at CTR and further evaluate the North Service Options in order to develop a planned approach for future growth and needs in the County.

Construction cost estimates were made for each phase of the capital improvements for the West Van Transfer and Recycling Facility. These estimates are based on construction costs for specific items from projects completed in Clark County or similar projects in the Pacific Northwest in 2023. The cost estimates represent a “Class 3 planning level” cost estimate meaning it carries a variance range of plus 30% to minus 20%.

**Table 9: Construction Cost Estimate – North Service Options and CTR**

| North Service Option and CTR Construction Cost Estimates | |
|---|---|
| **New Transfer Station** | **$34,000,000** |
| **Satellite Convenience Center** | **$25,000,000** |
| **CTR Expansion (Excludes Option 1A)** | **$3,500,000** |

**Recommended Implementation Schedule**

It is important to **expedite the construction of the Phase 1 improvements** to eliminate vehicles from queueing on to Hwy. 503. The County, working with its partners, will need to **further evaluate the options for serving the north service area for the long term.** More information related to the potential of developing on the adjacent parcel just west of CTR is needed as well as evaluating options to site a new transfer station. The County will need time to make any decisions and it may take several years to permit any of the options so Phase 1 improvements will be crucial. The CIP can use the planning level cost information to prepare a financial plan to fund the ultimate decision for building the facilities needed to serve the north service area.

## Washougal Transfer Station (Washougal)

### Introduction

Washougal began operations in 2009 and is operated by CRC. The facility is located on a 4.6-acre site in the Port of Washougal. Customers enter from Grant Street to a scale house complex that includes one inbound scale and one outbound scale. Each customer must be weighed, and fees are assessed based on total waste disposed. The facility includes an 80-by-60-foot transfer station building (4,800 sf) for customers to unload waste. Transfer trucks enter the east side through a depressed tunnel for loading trailers that are transported to the Wasco Landfill in The Dalles, Oregon. The station operates as a lift-and-load, meaning the bottom of the tunnel is only eight ft below the tipping floor. A front loader is used to lift waste about nine ft to load trailers. This operation does reduce the time to load trailers, but waste can spill off the sides and onto the tunnel floor, which requires regular cleaning.

The transfer station has three (3) 22-foot-wide access doors located on the west side where collection trucks unload. This design allows for up to six (6) vehicles to unload at one time. The layout of the facility is shown in **Figure 20.**

**Figure 20: Current Washougal Site Plan**


The facility is open six days per week (Monday-Saturday) for commercial collection trucks from 7 a.m. to 5 p.m. The transfer station is open to the public and self-haul traffic on Wednesdays and Fridays from 7 a.m. to 5 p.m., and Saturday from 8 a.m. to 4 p.m. When the facility is open to self-haul customers commercial collection trucks can use a 22-foot roll-up door on the south side to unload.

The facility also provides a drop-off center where customers can bring commingled and source-separated materials to recycle. The drop-off center is open to the public Monday through Friday from 7 a.m. to 5 p.m. and Saturday from 8 a.m. to 4 p.m. Customers can drop off HHW every third Saturday of the month from 8 a.m. to 4 p.m.

In Phase 1 RSWSS, an assessment of the conditions of Washougal was conducted. Some minor repairs are required but primary structures and site appear in good condition.

**Summary of Phase 1 RSWSS – Assessment**

The assessment of the transfer station operations was made on Wednesday, February 12, 2020. The site visit included a meeting with the site manager and a review of current conditions. This operations review focused on how the site manages traffic and waste handling and loading under the present conditions. The assessment will consider how the current facilities can manage future waste volumes and traffic to service the eastern portion of the County. During this same visit, a physical condition assessment was made by structural and civil engineers. A full report of the physical site conditions is presented in RSWSS Phase 1 Report Appendix D, Conditions Assessment (see Appendix L).

Conditions Assessment

The limited structural and site improvement conditions assessment reveals most of the assets at the site are in good condition except for areas of pavement, which are in fair condition.

- The transfer station is in **good** condition. Siding damage behind the trailer lift-and-load area was observed. The damage is not structural. However, the damaged siding should be repaired to prevent potential corrosion problems due to moisture penetration.
- The HHW canopy, the scale house, and the administration office are in **good** overall condition. No short-term action is needed.
- The gravel storage area is in **good** condition. No short-term action is needed.
- The public recycling area is in **good** condition. Small areas of cracked pavement were observed. No short-term action is needed. The cracked pavement should be repaired in the future.
- The drive aisles that course through the site are paved with asphalt concrete pavement. In general, the paving is in **good** condition except for in the truck maneuvering areas. We recommend the worn surface areas be repaired or replaced.
- The storm facilities, the sanitary system, and the water system are overall in **good** condition. No short-term action is needed.

The structural and civil conditions assessments were limited to those areas that are readily accessible and visible to field staff. Concealed conditions that become exposed in the future may change our current recommendations made here.

Operational Assessment

In Phase 1 during the site visit, the site manager for CRC reported the facility has no significant operating deficiencies. At times, traffic can back up to the street, but it is not a routine condition. However, this is based on the number of customers and waste volumes having remained similar in the past few years. With moderate growth in customer traffic on Wednesdays and Saturdays, additional unloading stalls are needed. Based on recent data in 2021, the number of inbound trips has increased by nearly 25% since 2019 placing a demand for providing more stalls to unload.

It was reported that commercial trucks will unload using the south door. Waste can then be pushed and lifted to dump into trailers on the east side of the building. Because the building is only 60 ft wide with only 45 ft available for storage of waste at certain times, waste can spill out of the building temporarily. This is not a routine event but is an indication of the limited surge or storage capacity of the station. On days when self-haul customers are unloading, there could be interruptions from unloading until the waste is clear from the tipping floor to allow self-haul access to certain stalls.

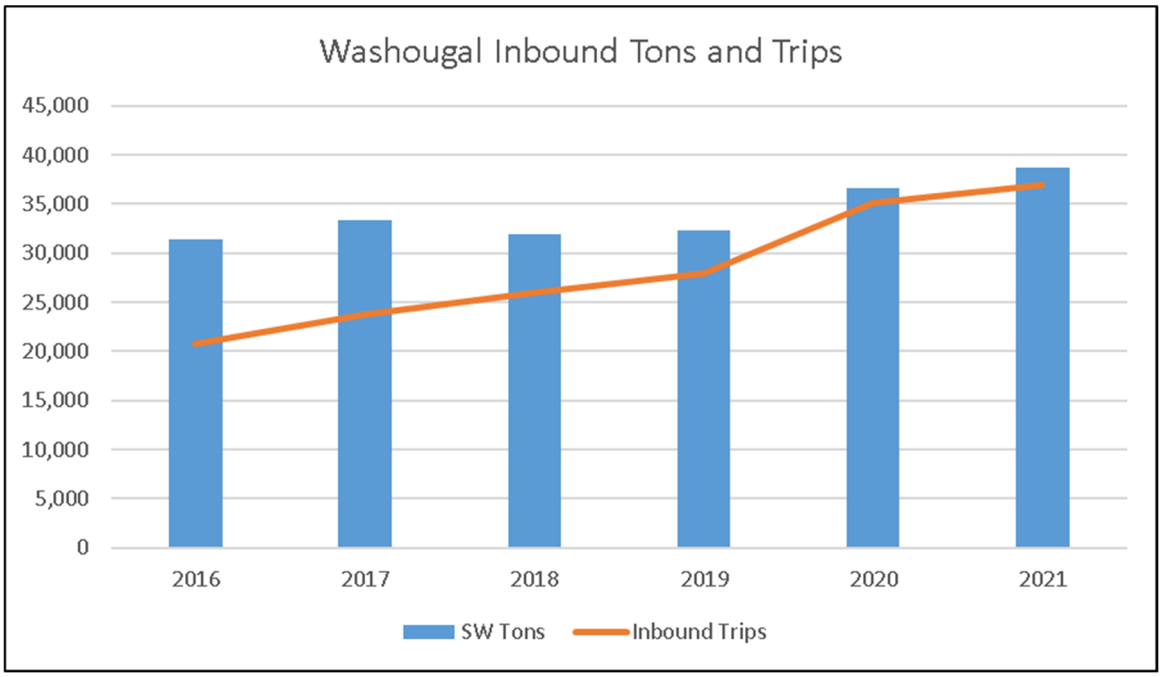
The recycling and HHW drop-off areas are accessible from Grant Street, even when the station is closed to self-haul customers. The overall space is sufficient for managing the recycling needs of the community. Likewise, the HHW facilities are sufficient for managing materials dropped off. The only drawback is that when

the HHW is open, traffic can back up and temporarily impede access to the recycling drop-off area. Fortunately, the HHW facility was designed to allow for two drive-through lanes for customers.

Washougal tons, trips, and capacity is based on the 2021 data. Washougal receives on average about 125 TPD assuming a six-day week operation and 150 TPD if a five-day operational week is assumed. The five-day average should be considered as most of the waste is received during this period. Most customers on Saturday are self-haul vehicles that have small loads.

As shown in **Figure 21** both the trips and total tons received have increased steadily over the past three years. This table has been updated with current numbers from the original Phase 1 report.

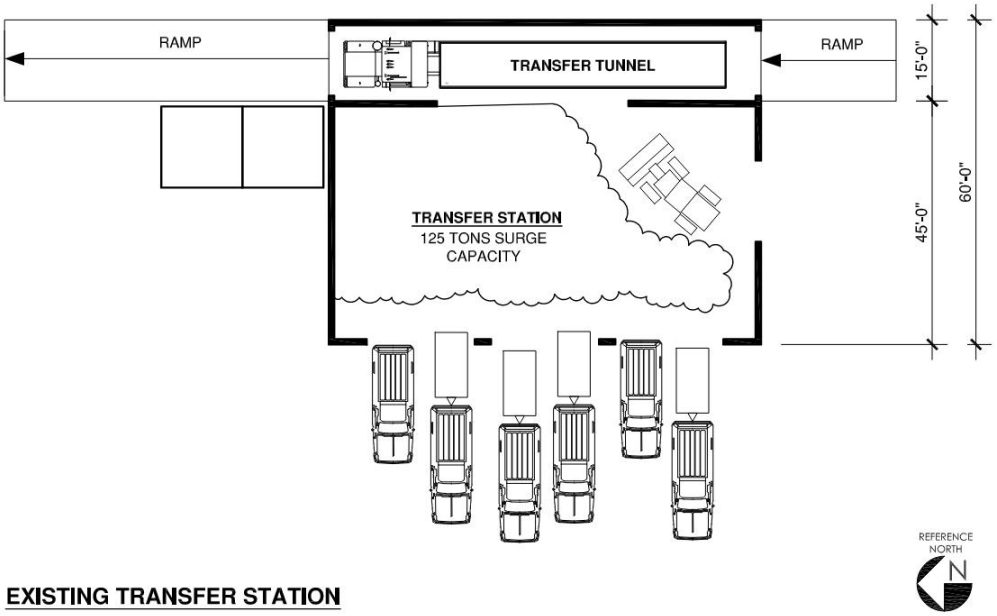
**Figure 21: Washougal Inbound Tons and Trips 2016-2021**




Existing Tip Floor Operation

The existing tip floor operation shown in **Figure 22** on the next page consists of an area that is approximately 40 ft x 60 ft or 2,400 sf. Accounting for the area to operate equipment to load transfer trailers leaves about 2,000 sf of surge capacity assuming no vehicles are unloading in the building. If the station receives 125 TPD the surge capacity requires about 1,700 sf to temporarily store waste. If the station receives 150 TPD, the needed surge capacity increases to 2,000 sf based on the current waste volume received the facility is basically at full capacity.

**Figure 22: Washougal Existing Tipping Floor**




Likewise, there are only six stalls available to unload the self-haul customers on the west side of the station. Based on 2021 data, Washougal receives about 200 self-haul customers per day over the three days of operation. This level of traffic suggests that six stalls is generally adequate for unloading this number of customers without causing major onsite queue issues. However, there could be certain times of the year where there are longer wait times to unload. During this period, the commercial trucks primarily unload on the south side of the station. Although the data suggest that a single stall is nominally adequate for unloading commercial collection trucks, it is more desirable to have at least two or preferably three stalls during peak hours. Some initial improvements were noted in the Phase 1 report. These include:

1. Expand the access lane to the HHW facility to improve traffic flow and safety.
2. Add a steel backsplash to protect the siding from damage caused from loading trailers and consider adding a short push wall on the tip floor side to increase surge capacity. This should reduce possible spillage of waste from the top-load operation.
3. Expand the transfer station building to accommodate future growth.
4. Increase the capacity of the scale complex and reduce potential of traffic backing onto Grant Street.

In the RSWSS Phase 1 Report (completed October 2021) it was noted that Washougal will need to be expanded soon. However, the County is currently considering the option to expand the number of days Washougal is open to receive self-haul customers. It is expected to help relieve some of the traffic issues at CTR. This decision may also impact the timeframe for expanding the existing Washougal Transfer Station as the tip floor does not have the capacity to handle more waste generated by growth or by decisions to expand the operating hours for self-haul customers.

Phase 2 – Washougal Facilities Plan

Using the preliminary analysis and findings from the Phase 1 RSWSS the facilites needed to serve the unincorporated eastern county and the cities of Camas and Washougal have been updated.

**Basis of Master Plan for Facility Improvements**

Based on the findings from Phase 1 RSWSS and the recently passed HB 1799, the updated design data in **Table 10** is recommended to be the basis of the Washougal Master Plan. This Basis of Master Plan considers that new census data and waste quantities received have resutled in new projections. Population in the two cities is expected to be approximately 50,000 in 2040. It is also assumed that another 50,000 people representing growth in the urabanized areas if east county and parts of the incorporated City of Vancouver may use the Washougal Transfer Station. Thus for design purposes it is assumed that the amount of waste received at the station could exceed 80,000 TPY by 2040.

Currently the station averages 25 self-haul vehicles per hour. With a stall being able to handle five (5) vehicles per hour, the current need is five to six stalls. Based on projections of 50 vehicles per hour in 2040, the need increases to 10 stalls.

**Table 10: Washougal - Basis of Master Plan Design Data (Updated per 2020 Census)**

| Category | | Existing (2021) | 2040 Projections | % Change |
|---|---|---|---|---|
| **Waste Quantities (MSW)** | | | | |
| Annual | Tons | 38,638 | 83,097 | 115% |
| Average | Tons/Day | 125 | 290 | 132% |
| Peak | Tons/Day | 150 | 350 | 133% |
| **Customer Tons** | | | | |
| WCW | | | | |
| All Commercial | Annual Tons | 32,040 | 68,000 | 112% |
| | Ave Daily | 120 | 193 | |
| Self-Haul /Cash | Annual Tons | 6,300 | 15,000 | 138% |
| | Weekly Tons (3 day) | 121 | 288 | 138% |
| **Trips** | | | | |
| All Commercial | Annual | 7,220 | 15,000 | 108% |
| | Daily (5 day) | 28 | 60 | 114% |
| Self-Haul/Cash | Annual | 29,669 | 66,000 | 123% |
| | Ave Daily (3 day) | 190 | 210 (6 day) | 11% |

**Notes**

#1 Source-Washington State – OMB

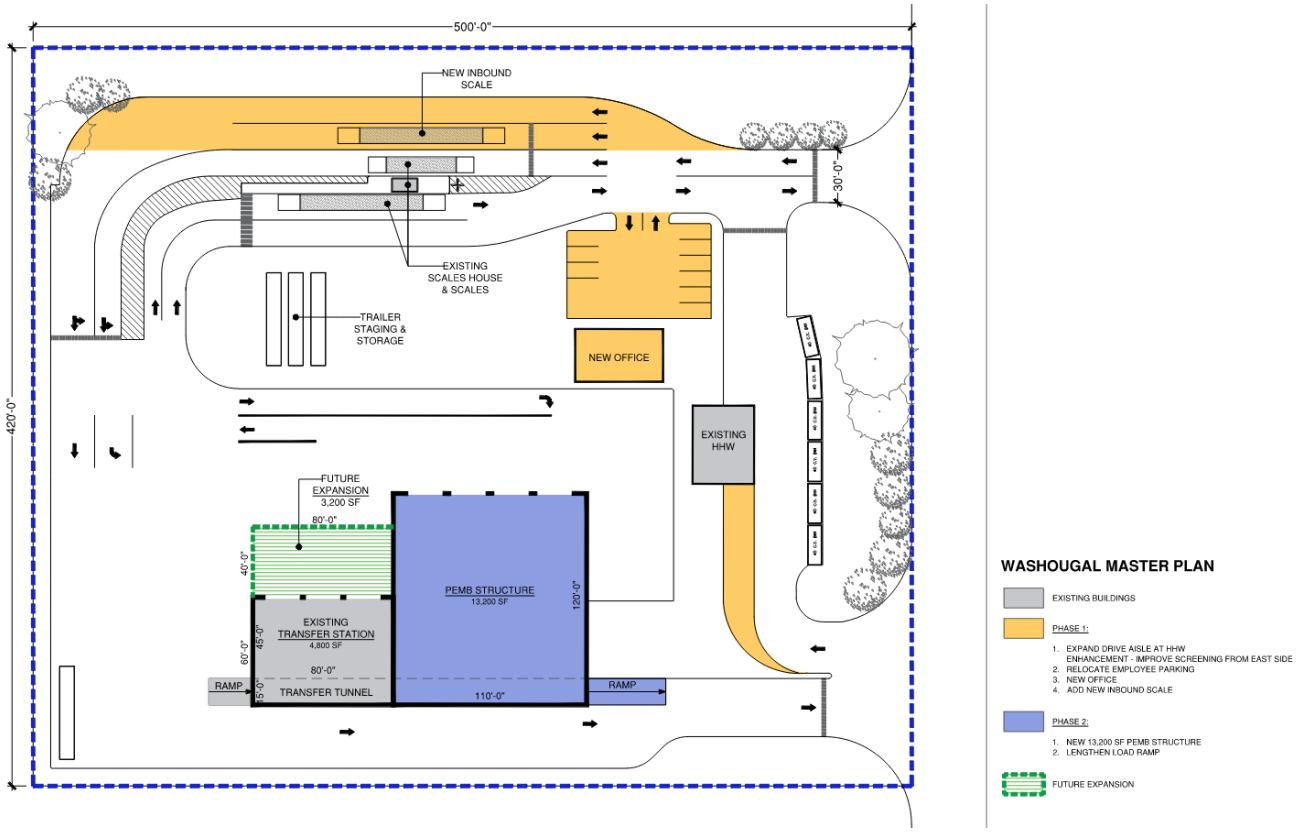
Organics Management

Washougal processed approximatly 48 tons of yard debris in 2021 and no source seperated commercial food waste was received. This volume is very little when compared to 32,000 tons of garbage collected on-site. With the passage of HB 1799, the design for Washougal will include the continued collection of yard debris and provide options for expanding reload capacity in the future. The site as currently used is not supportive of any preprocessing options for organic material.

## Description of Improvements of Master Plan

To meet the needs of the service area, there are improvements that should be planned to provide more unloading stalls and to add tipping floor space. Additional load out capacity is desirable. This site map in **Figure 23** below shows four improvements to be included in the Capital Improvements Plan for Washougal.

**Figure 23: Site Map Showing Improvements**




These improvements are as follows:

1. A short-term improvement mentioned by the operator was to expand the access lane to the HHW facility. This is a minor investment to improve traffic flow and safety and could be completed in the near future.
2. Add screening on the east side of the HHW building to reduce exposure to the elements.
3. Add a steel backsplash and chute along the east side of the building in the load-out tunnel. This backsplash will protect the siding from damage caused from loading trailers. It should also reduce possible spillage of waste from the top-load operation. Also, consider adding a short push wall on the tip floor side to increase surge capacity.
4. Expand the transfer station by adding a new 13,200 sf PEMB structure and paving the yard to increase capacity. This will include expanding the below grade loading tunnel.
5. Expand the entrance road to increase the capacity of the scale complex and reduce potential of traffic backing onto Grant Street.
6. Build a new office or relocate the existing building and relocate parking.
7. Provide space for trailer storage and other storage.
8. Consider future expansion at the existing transfer station entrance.

### Estimated Construction Cost for Washougal Transfer Station Capital Improvements

Construction cost estimates were updated from the Phase 1 Report. The primary increase in these costs relates to the updated Basis of Master Plan data that suggests the facility is currently operating above capacity both in managing traffic and waste flows. Traffic for self-haul customers has increased over the past two years and projections of waste to be received at the facility are significantly higher. Thus, a much larger expansion is required to meet this future demand.

Construction cost estimates were made for each phase of the capital improvements for the West Van Transfer and Recycling Facility. These estimates are based on construction costs for specific items from projects completed in Clark County or similar projects in the Pacific Northwest in 2023. The cost estimates represent a "Class 3 planning level" cost estimate meaning it carries a variance range of plus 30% to minus 20%.

**Table 11: Construction Cost Estimate – Capital Improvement Plan**

| Washougal Transfer Station Construction Cost Estimates | |
|---|---|
| **New Access Road and Scale/New Parking**<br>Description:<br>1. Expand the entrance road and install dedicated scale for commercial vehicles. | **$600,000** |
| **New Transfer Station Expansion**<br>Description:<br>1. Construct a new PEMB structure (120' x 110'), extend transfer tunnel, build new office, or relocate existing office and create new parking for employees. | **$4,100,000** |
| **Total Construction for Option w/ New Office** | **$4,700,000** |
| **Total Construction for Option Relocation of Existing Office Assuming Use of Existing Office (Reduces Total ~ $ 700,000)** | **$4,000,000** |
| **Total Estimated Construction Cost for CIP** | **$4,700,000** |

### Recommended Implementation Schedule

This facility is already operating beyond capacity and should be a priority for the County. Design and construction for expanding the Washougal Transfer Station should be completed in the next three years. The master site plan does suggest a phased construction to enable the facility to remain in operation during construction. Further details are included in the CIP.

## Summary of Phase 1 and 2 RSWSS Recommendations

The RSWSS represents a comprehensive review of the operations and facilities serving the County and the cities. The project was completed in two phases. During Phase 1, a thorough assessment of the physical condition of each facility was performed along with a review of operations. The results identified the needs and opportunities to upgrade facilities to meet both current deficiencies and develop the infrastructure to meet the needs of a growing population.

Many alternatives were evaluated while working with County staff as well as the City of Vancouver. Preliminary site plans were prepared to consider the best options for building the needed infrastructure. These results were carried forward into Phase 2 to complete a Regional System Facilities Plan.

Also, in Phase 1, the County considered options to existing policies and practices that might result in improving operations. Recommendations were made and are still under review.

The following represents the list of recommendations presented in both Phase 1 and 2 of the RSWSS. Important to note that several of these recommendations are impacted by the ongoing negotiations with CRC regarding operations of the transfer station system.

**General Policy and Administration Recommendations**

1. The County should establish a fair operating margin to compensate CRC for continuing with operations of solid waste facilities for the next five years or for a set period to be determined.

   **Status –** The County is currently in negotiations with CRC and is expected to address financial compensation for the operation of facilities.

2. Revenues generated in excess of the cost of services plus the established operating margin should be remitted to the County. The remitted revenues will be encumbered to fund capital improvements in the solid waste system.

   **Status –** The County is currently in negotiations with CRC and is expected to address financial compensation for the operation of facilities.

3. The County should establish a facility R&R evaluation process and a dedicated fund that will maintain system assets.

   **Status –** A preliminary R&R format was prepared but was not completed. The County is proceeding with a new contract to perform a more detailed assessment of conditions which could be used as the basis for preparing a schedule for establishing an R&R.

4. The County should approve funds for implementing Phase 1 of the CTR site improvements to eliminate any potential for inbound customers from queueing onto the public right of way on state Hwy. 503. The improvements include extending the entrance road and new scale onto the adjacent property located west of the current transfer station. Details of these improvements should be negotiated as part of the contract extension.

   **Status –** This recommendation is reaffirmed in the Phase 2 – Facilities Plan and is included in the CIP.

5. The County should establish a minimum rate for all customers using the transfer stations. Under the current tip fee policies, customers that bring less than 300 lbs. are not paying the cost of services. Implementing this policy may also provide an incentive to subscribe to regular collection services or cause customers to make fewer trips by consolidating their loads.

   **Status –** No formal decision has been made regarding establishing a minimum rate at transfer stations. The County has reviewed this recommendation with the SWAC and with the Regional Steering Committee.

6. The County should extend the hours of operations at both the West Van and WTS.

   **Status –** No formal decision has been made to extend the hours of operations at West Van and WTS. The County has reviewed this recommendation with the SWAC and with the Regional Steering Committee.

**Ownership Recommendations**

The following recommendations were adopted by the SWAC and endorsed by the Regional Steering Committee.

1. Solid waste staff recommend the County and/or City of Washougal exercise the available contractual options to purchase the facilities when the option of public ownership becomes available.
2. Solid waste staff recommend the option to publicly own and privately operate the regional transfer facilities under contract to be further evaluated. The evaluation should focus on the advantages and disadvantages of public operation of the scale houses versus fully contracted services.
3. Solid waste staff recommend further evaluation of Joint Municipal Utility Service model to own and operate the system. The evaluation should include an extensive stakeholder outreach and input process prior to the formation of a multi-jurisdictional organization.

**Organics Recommendations**

1. It is recommended the County prepare an organics management plan to address actions needed to comply with the goals established under HB 1799. It should include reviewing the feasibility of alternatives for implementing best management practices and implementing the most cost-effective strategy for handling organics. This includes considering both collections services for organics, processing and technologies to convert organics into renewable energy, and/or new products.

**Recommendations of Phase 2 Regional System – Facilities Plans/CIP**

The Facilities Plan identified $26.5M (2023 $) of capital improvements will need to be made over the next seven (7) to 10 years. Additional investments were also identified that could range from $18M to $34M depending on which option is implemented to serve the north service area currently managed at the existing CTR.

Recommendations for implementing system improvements are described in the CIP and are summarized as follows.

**CTR Recommendations**

1. Construction of an extension of the inbound lane onto the adjacent parcel west of the existing facility is the highest priority and should be completed by 2025.
2. The County should complete an evaluation of the options for the north service area in the next two years. This includes considering the necessary siting and permitting process and determining conditions related to expanding CTR.

**Washougal Recommendations**

1. The County should proceed with plans to expand Washougal. This would include providing survey and geotechnical data by the end of 2023. Final programming and design should then begin in 2024. It would be desirable to have the new expanded facility operational by the end of 2026.

**West Van Recommendations**

1. The County should proceed to complete site survey and geotechnical information by mid-2024. This would include gaining approval to extend city water and possibly sewer to the site. Design of first phase improvements could proceed in 2024 with construction in 2025.

2. A determination of a final schedule to remove the MRF should be made by the end of 2023. This would enable the County to make decisions on expanding the organics management improvements.

The recommendations and proposed schedule of capital improvements are further outlined in the CIP. The County will need to monitor the progress of these recommended actions and update the CIP annually.

## Clark County Regional Solid Waste System Capital Improvement Plan (CIP)

### Regional Solid Waste System Study - Findings for Capital Improvement Needs

The findings of the Phase 1 RSWSS and Facility Plan conclude the existing transfer stations do not have the capacity to manage current waste flows and traffic from customers. All three transfer stations experience operating deficiencies to provide services to customers. CRC has adapted to these conditions to operate safely, but the facilities are undersized to efficiently manage the current customers and waste volumes and cannot handle the increase in waste generated from future growth in the County. During peak periods at CTR, traffic will back onto Hwy 503 from both directions as they wait to enter the facility to weigh in and unload. At both West Van and Washougal customer traffic can also back onto the public right of way. Currently the facilities do not provide sufficient stalls for customers to unload.

In addition, there are no planned facilities to handle other waste streams or integrate programs to reduce waste disposed. This includes the need to handle mixed organics where collection programs for food waste mixed with yard waste from cities is already straining the tip floor space and operations at West Van. The amount is expected to increase significantly with the implementation of HB 1799 requirements by 2030. As acknowledged in the 2023 SWMP update, the County plans to evaluate the needs and opportunities to accept and process construction and demolition waste. The infrastructure required to meet the demands of these trends needs to be incorporated into modernizing the regional system.

In the Phase 1 RSWSS, JRMA completed an assessment of the current processing equipment at the West Van MRF. A MRF feasibility study was prepared and concluded that a new equipment line should be installed using advanced processing technology. The new equipment could be installed at West Van if expanded or at a new facility in the County. A new MRF could be constructed at a different location. Removing the processing equipment from the West Van Transfer Station would free up approximately 45,000 sf of enclosed structure to be used for other services. There is the option to repurpose CTR as a MRF if the County decides to build a new transfer station to serve the north service area.

The updated facilities plans for each transfer station acknowledges the need to provide space to receive and transfer mixed organics. The West Van CIP includes a plan to expand the existing structure to provide a covered area to receive food source separated food waste from commercial generators and mixed organics collected at residences. A new top load out station will allow the material to be transported to a compost facility. The West Van plan also provides the flexibility to construct mixed waste organics processing facilities such as aerated static pile composting (ASP) or possibly an anaerobic digestor unit(s).

### Capital Improvement Plans

With completion of the Facility Plan, the major improvements needed to upgrade and expand the County have been defined. The following table lists the estimated capital to be budgeted over the next seven (7) years. Referred to as the Baseline CIP, these improvements are necessary to address both immediate deficiencies at the facilities while providing the flexibility to make additional investments to expand operations and provide solid waste and recycling facilities needed over the next 25 years.

**Table 12: CIP Baseline Projections for Existing Transfer Stations**

| Capital Improvement Plan – Baseline Projections Estimates | |
|---|---|
| CTR – Phase 1 | $6,500,000 |
| Washougal – Phased Construction Plan | $4,700,000 |
| West Van – Phased Construction Plan | $15,300,000 |
| **Total Estimated Capital For Baseline CIP** | **$26,500,000** |

The Baseline CIP will need to be updated annually to reflect changes to the projected revenue requirements. The construction cost information is based on projects in the region completed in 2023. It assumes that 2023 construction costs will increase by 3.5% annually, based on recent data.

**Schedule and Key Assumptions for Implementing the CIP**

CTR/ North Service Area

It is recommended that the County begin the initial phases to execute design and construction improvements at each facility. The highest priority is to build the Phase 1 improvements at CTR. During peak periods traffic continues to queue onto Hwy 503. These improvements will provide the queue space to rectify this condition and provide flexibility to operate with less onsite congestion at times. The Baseline CIP also includes a budget to expand the transfer station on the existing property referred to Phase 1A. This improvement is not scheduled to be made until 2026 and may not be implemented depending on which option the County decides to pursue for managing waste in the north service area.

The decision of which option to pursue in the north service area is expected to be complete by 2026. The Regional Facilities identified three options listed below.

**Table 13: CTR and North Service Options Cost Estimates**

| North Service Option and CTR Construction Cost Estimates | |
|---|---|
| **Build New Transfer Station** | **$34,000,000** |
| **Satellite Convenience Center** | **$25,000,000** |
| **CTR Expansion (Excludes Option 1A)** | **$18,000,000** |

CTR currently receives 60% of the waste generated in the County and is expected to experience the largest amount of population growth based on information from the growth management plan. Over the next two years the County will need to consider the timeframe and process associated with siting and permitting a new site versus expanding CTR onto the adjacent property. Another factor to consider in this decision is the question of public ownership of the regional system. At this time the County has leaned towards a preference to own the system and contract with a private company to operate facilities.

Assuming a decision on which option is chosen, the County will need to update the CIP to anticipate the future expenditures. Based on 2023 cost estimates, that could range from $18M to $34M plus inflationary cost. However, these costs are based on conceptual master plans as presented in the Facility Plan. Further analysis of the options with additional programming and design development will provide updated and more accurate

cost information. The JRMA consultant team has prepared CIP projections for each option to be used for financial planning purposes.

Washougal Transfer Station

Improvements at Washougal are considered a lessor priority but preliminary sitework should begin soon. Over the past two years the amount of waste received and number of self-haul customers have increased by 20% and 32% respectively. Thus, on peak days the amount of waste can exceed 150 TPD. As discussed in the Facilities Plan, the transfer station does not have the capacity to handle the surge during these events. For these reasons Washougal should be considered a priority, however CRC may implement measures to minimize impacts on operations until the facility is expanded.

Initial work to begin planning for making improvements could include conducting a site survey and preparing final programming and design development by the end of 2023. The decisions made to make improvements may also need to consider ownership, as the City of Washougal has the right to pursue this option. If these activities do proceed, final design could begin in 2024 and construction in 2025.

Other policies that may impact the timeline for making improvements at Washougal relate to possibly increasing the number days it is open to self-haul customers and establishing a minimum fee. Currently, Washougal is only open for self-haul customers three days per week (Wednesdays, Fridays, and Saturdays).

West Van

The West Van facility is the primary materials handling facility in the County. Located at the Port of Vancouver it not only operates as a transfer station, but also receives and processes all recycled materials, yard waste and mixed organics collected in the County. Solid waste is transferred less than a half mile on a private road to the barge operation, recyclables are processed and shipped to markets and organics are sent to Dirt Huggers, a compost facility in the Columbia Gorge near The Dalles, Oregon.

Similar to the other stations, self-haul traffic backs up onto Old Lower River Road and the limited space for onsite queue adds to congestion that impacts operations. The master plan prepared in this report presents revisions to the site circulation and provides configuration of on-site operations to reduce congestion and improve operating efficiency. It also includes an extension of the City water line to upgrade fire suppression and removal of obsolete structures.

The master plan provides information for creating the structures and space to manage future waste streams such as organics, construction and demolition wastes and/or other services required by the County and its partners. It presents a multi-year construction plan to allow improvements to be made while maintaining the necessary operations and services required.

The most critical element of completing the makeover of West Van is the decision whether to relocate the MRF. Anticipated to be completed over the next five years, the removal of equipment from this facility will open up approximately 45,000 sf of the enclosed structure. This space can then be re-purposed for managing mixed organics or other services.

The Baseline CIP acknowledges these events and describes the improvements to be made over the next seven years. With very limited space to manage the growing amount of mixed organics collected from both the Cities of Vancouver and Ridgefield, the plan shows the need to expand the existing MRF building in 2025. Until a firm decision and schedule for relocating the MRF is known, this improvement should be implemented.

If the MRF is relocated, recycled materials received at West Van will need more space for transferring to the new location. The master plan includes the expansion of the recycling and HHW drop off facilities to improve services and promote efficient operations.

Discussed in the master plan is the need to provide space to add future operations and services. Investments in future operations was not part of the RSWSS scope. Although these have not been clearly defined, the plan

provides flexibility to add new facilities either inside the old MRF structure or possibly on the seven acres in the back of the property. Once a firm decision and schedule for relocating the MRF equipment is known, the County can review the master plan and determine revisions as required.

In conclusion the Baseline CIP provides the road map for making the necessary upgrades and expansions for the regional system. It provides a tool for managing the financial resources required to meet the demands for continuing to provide convenient and cost-effective services.

**Financial Analysis for Capital Improvements**

The Phase 1 RSWSS presented the options for making the necessary investments to modernize the County system. While preparing the Phase 1 Report, the JRMA team completed a review of the total cost of operating the solid waste system for the year ending in 2019. The financial review was conducted within the guidelines provided for in the contract between the County and CRC. The analysis provides information that will enable the County to evaluate impacts on rates for making capital improvements.

The revenue requirements for the capital improvement plan have been updated in the Facility Plan. The baseline CIP demonstrates the need to initially plan for $26.5M of investments in facility upgrades and expansions. The following table shows the estimated cost to operate the solid waste system in 2022 as projected from the 2019 cost of services review. Total revenues under the current rates are estimated at $43.8M based on the incoming waste received in 2022. Expenses unrelated to the transfer station operations are $13.4M. These expenses include county and city fees, Washington State refuse taxes, and disposal cost. The transfer station operational cost is estimated to $30.4M, and the net revenue generated from current rates is $13.4M in 2022. **Table 14** summarizes these costs.

**Table 14: 2020 Transfer Station Revenue, Costs, and Income Projections**

| Description | Cost per Ton | Waste Tons | Total Cost |
|---|---|---|---|
| Revenue | $107.83 | 406,170 | $43,798,122 |
| Less Non-Related TS Costs | (33.09) | 406,170 | ($13,439,566) |
| Transfer Station Operational Costs | $74.74 | 406,170 | $30,358,556 |
| **Net Income** | **$33.09** | **406,170** | **$13,439,566** |

As a percentage of the Transfer Station Operational Cost, net income is 44% ($33.09 / $74.74). There are two primary reasons for the high margin. First, the County and CRC agreed to a phased-in reduction of the MRF subsidy without a proportional decrease in the waste disposal fee. Prior to 2017, the MRF was subsidized by the profitability of the transfer system. Second, through the life of the contract, CRC has depreciated the capital investments of the transfer station system. The last material investments made by CRC were in 2009 (Washougal Transfer Station) and 2019 (West Van compactor). It appears from the financial information that most of the capital expenditures are fully depreciated. Typically, capital depreciation is planned to reach zero near the end of an operational contract.

It is also important to note the unit cost to operate the County stations is not necessarily comparable to other transfer stations. This is because the level of services provided and the operations of each transfer station themselves can vary significantly. For instance, Metro contracts out its transfer station operations. However, Metro operates the scales/gatehouse at each facility. In addition, Metro owns the facilities and is responsible for making most repairs. As such, they have established a renewal and replacement account to fund these repairs and replace equipment. CRC is a full-service vendor that manages all of the activities and functions associated with the operations of all three facilities and making repairs.

The financial analysis supports the conclusion that current rates generate sufficient revenue to fund capital improvements. The County is currently negotiating a new contract to address the funding capital investments.

# Appendix A: Phase 1 Summary

# Summary of Phase 1 Report

## Regional Solid Waste System Study

October 15, 2021

**Final**


**Prepared for**

Environmental Health Department

JRMA
ARCHITECTS ENGINEERS

**In Association with:**

AKS Engineering & Forestry Inc. | Bell & Associates | Swordfish Consulting Services

# Clark County

## Department of Solid Waste

## *Regional Solid Waste System Study*

**Prepared by:**

**JRMA Architects Engineers**

**In Association with:**

AKS Engineering & Forestry Inc.
Bell & Associates
Swordfish Consulting Services

**October 15, 2021**

## Table of Contents

# Summary Report

# Phase 1 - Regional Solid Waste System Study

## Chapter 1 – Introduction

The JRMA Consultant Team completed the first phase of the Regional Solid Waste System Study (RSWSS) for Clark County (County). This document provides a summary of the findings and recommendations to be discussed with stakeholders to provide a direction for moving forward with Phase 2. It also outlines the critical decisions that are needed for making the necessary investments in the solid waste system to efficiently manage waste and recyclables for the next 20 years.

***Background***

The current solid waste system evolved from a set of events in the early 1990s that resulted in the closing of local landfills and reliance on large regional landfills in eastern Oregon and Washington to dispose of waste. This led the County to contract with Columbia Resources Company, a wholly-owned subsidiary of Waste Connections of Washington (WCW), to build two transfer stations, West Vancouver Material Recovery Facility and Transfer Station (West Van) and Central Transfer and Recycling Center (CTR), to receive waste and re-load into larger trailers/containers for transportation to Finley Buttes Landfill located in Boardman, Oregon. Most of the County's waste is transported by barge, which is a separate contract, with Tidewater Barge Company. A third transfer station was constructed in 2009 in Washougal to manage waste in the eastern part of the County. Waste from the Washougal Transfer Station (WTS) is transported via semi-tractor-trailer to the Wasco County Landfill near The Dalles, Oregon. Waste Connections owns both Finley Buttes and Wasco County landfills. Over the past 30 years, no significant improvements or expansions have been completed on the transfer system.

The agreement with WCW has been in place since 1991 and is a contractual relationship with the County and cities for operating transfer stations, material recovery facility (MRF) at West Van, and transporting and disposing of waste. The contract timeframe has been extended until December 31, 2021. It provides for another five-year extension until December 31, 2026.

A crucial provision in the contract allows the County to take ownership of the transfer station system by January 1, 2026, provided WCW is notified by December 31, 2025. The intent for providing this option was the fact that the existing transfer station has been paid for by ratepayers; therefore, these facilities should become public property. This contract provision assumes the County intends to exercise this option. The regional study considers options available for the County to exercise the ownership provision.

The purpose of the RSWSS is as follows:

1. Provide a comprehensive financial review of the cost of services and operation of the facilities.
2. Complete a comprehensive assessment of the physical condition of the existing facilities to identify repairs, equipment, and infrastructure replacement, and estimate the respective costs.
3. Assess operational conditions of each facility and necessary capital investments needed to enhance existing operations and meet the demands of future waste volumes.
4. Consider changes to waste and recycling collection services that could reduce self-haul traffic at the transfer stations.

5. Prepare a 20-year Capital Improvement Plan (CIP).
6. Engage the regional partners and stakeholders to review the study findings and develop a strategy for the system's future development.

A summary of key issues and findings by Chapter from the RSWSS, as well as recommendations, if applicable, follow below.

## Chapter 2 – Waste Generation Projections

***Key Issues***

1. With the expected growth in the County, how much waste will be generated over the next 15 years?
2. Where will the waste be generated, and what are the impacts on the transfer station system?
3. How does this increase in waste volume impact each transfer station?
4. As the County evaluates ownership options, what is the existing condition of the transfer station structures and site features?
5. What is the cost of making improvements to address minor repairs or deficiencies at each station?

***Findings***

The project team completed estimates of the amount of waste to be managed by the solid waste system using population projections provided by the Office of Financial Management (OFM).

1. Clark County's population is expected to grow from 490,000 to 643,000 people by 2040.
2. Waste generation is estimated to increase from 390,000 tons per year (TPY) to almost 520,000 TPY by 2040, an increase of 130,000 TPY, or 33% in the next 20 years.
3. Based on assumptions presented in the County's Growth Management Plan, a range of 58% to 70% of this growth will occur in the CTR service area. The Cities of Battleground, Ridgefield, and La Center are expected to more than double in population by 2040.

The population growth is estimated to generate 130,000 tons of additional waste per year that must be managed by the transfer station system.

## Chapter 3 – Operational Efficiencies and Impacts from Traffic and Public Self-Haul

Self-haul traffic at the transfer stations has increased, particularly at CTR. Continuing to provide a safe level of service at the transfer stations will require additional improvements and expansion at all facilities. Almost 30% of the self-haul customers have less than 200 pounds (lbs.) per load; these are very small loads that accentuate the traffic challenges at CTR.

Several cities have instituted universal collection services for all households and businesses. However, in the unincorporated areas of the County and within the City of Battleground, subscribing to regular collection services is optional. The cost to handle the traffic and loads at the transfer stations exceeds the cost for households to subscribe to regular collection services. Chapter 3 presents options that may be adopted to possibly incentivize customers to consider subscribing to collection services, which could effectively reduce the number of self-haul trips to CTR.

***Key Issues***

1. Would self-haul traffic at the transfer stations decline if universal waste and recycling collection services were required throughout the County?
2. Based on the current rate structure, are self-haul customer rates covering the cost for service at the transfer stations?
3. Could changes in the collection services, such as the expansion of bulky waste collection, reduce traffic at the transfer stations?
4. Are there changes to the rate policies that would incentivize individuals to subscribe to collection services, and therefore, reduce traffic?

***Findings***

1. Specific data that suggests a correlation between enacting universal services and the reduction of traffic at the transfer stations are not available.
2. Adopting universal service and expanding the collection services for bulky items is a common practice that may reduce self-haul traffic at transfer stations.
3. Self-haul customers with loads less than 400 lbs. are not charged rates that cover the cost of services provided at transfer stations. To offset this cost customers with small loads at the transfer stations are being subsidized by the large volume collection route trucks. In other words, customers that subscribe to waste collection services are subsidizing the low-volume self-haulers that use the transfer station system.
4. A survey of transfer stations throughout the Pacific Northwest demonstrated it is common that a minimum rate is charged for the self-haul customers at these facilities. In most cases, the minimum fee is assessed to a minimum load weight between 300 to 460 lbs. The minimum fee charged for these loads ranges from $18 to $30 per vehicle (2020 Data).
5. Establishing a minimum fee of $25 would be equivalent to the current charge for 400 lbs. at the County transfer stations.
6. The County should consider opening both West Van and Washougal transfer stations on Sundays to self-haul customers. The additional hours of operation may reduce traffic at CTR.

***Chapter Recommendations***

1. The Solid Waste Management Plan Update process should further evaluate expanding universal services and programs for the collection of bulky waste items for residences.
2. Adopt a minimum fee at transfer stations that covers the actual cost of services.
3. Expand the operating hours at both West Van and Washougal.

## Chapter 4 – Regional Transfer Stations Operations and Conditions Assessment

The County is proceeding with negotiations with CRC to continue operations of the transfer station system. Phase 1 of the regional study focused on reviewing the current conditions of the three stations to determine what improvements are needed to maintain safe and efficient services to residences and businesses.

***Key Issues***

1. What is the physical condition of each station, and what repairs and/or replacements are required to maintain operations?
2. What improvements are needed to enhance operations and meet the future waste volumes of the areas served by each transfer station with the expected growth within the County?
3. What are the entrance improvements needed at CTR to mitigate off-site queueing onto Highway (Hwy.) 503, and how soon can they be completed?

***Findings***

The engineering team conducted a condition assessment of each transfer station to inspect physical assets and review operations.

**CTR Findings**

1. Working with the County and Washington State Department of Transportation (WSDOT), CRC has proceeded with construction to modify the entrance off Hwy. 503 to provide two inbound lanes for vehicles to access the station. The new entrance would allow those vehicles traveling from the south to make a left turn into a dedicated lane. These vehicles would not need to compete with traffic making a right turn from the north. Construction is expected to be completed by the end of 2021.
2. The transfer station building has been maintained and is in good condition. Some minor repairs are recommended.
3. The current CTR facilities began receiving waste in 1992 when the entire County generated less than 200,000 TPY. In 2020 the entire transfer station system handled over 370,000 tons with CTR receiving 230,000 tons. There have been no major improvements or expansions to the facility since it was constructed.
4. Over the next 15 years, the north portion of the County is expected to grow and generate between 64,000 and 75,000 more tons of waste per year. CTR could receive an additional 300 tons per day (TPD) plus more traffic.
5. CTR receives over 60% of all waste generated in the County. At peak periods, CTR receives about 1,000 TPD and can have between 900 and 1,000 vehicles on a weekend day. As a result, there are several deficiencies and significant improvements are needed to handle the current waste quantities and customer traffic.
    a. Even with the new entrance improvements, there is insufficient queue space to handle the current traffic. An additional inbound scale is needed onsite to provide onsite queueing for self-haul customers.
    b. The existing transfer station building does not provide sufficient space for vehicles to unload and for managing waste quantities received.
    c. With only one compactor, the loadout capacity is only 900 tons over 12 hours. Also, if the compactor is out of service for repairs, there is no backup. This can result in reduced payloads in transfer trailers and increased costs.
    d. The current site circulation should be revised for safety purposes by mitigating the mixing of commercial trucks and transfer trucks with self-haul traffic.

e. If the facility is upgraded, then such improvements should include mitigation measures to reduce potential impacts on the neighboring residential developments.

6. There are three options for addressing current conditions and for serving the north/central part of the County.
    a. Make major improvements to CTR to address current and future needs.
    b. Make minor improvements to CTR and build a new satellite transfer station to serve the growing population in the Ridgefield, Battleground, and La Center area.
    c. Build a new transfer station to serve this area at a new location.

These options are discussed in Chapter 5 – North Area Serve Options.

**West Van Findings**

1. The transfer station is in fair condition with damage to some building columns. Repairs should be made in the future.
2. All other support structures are in good or satisfactory condition.
3. Bay 1 is dedicated to receiving and transloading organic materials with food waste. It is expected that programs for collecting food waste will be expanded, and Bay 1 will not have sufficient space to manage this material.
4. The MRF process line will need additional equipment to improve throughput and enhance the quality of recovered materials to meet market conditions. These improvements can be made; however, a new process line will need to be installed either at West Van or possibly at a new location. The MRF Feasibility Report is provided in Chapter 7 of this Phase 1 Report.

**Washougal Transfer Station Findings**

The condition of the transfer station is good; however, there are some improvements to the loadout area that should be made to protect the building panels and to enhance loadout operations. A concept plan for improvements and expansions was prepared. These improvements are as follows:

1. A short-term improvement to expand the access lane to the household hazardous waste (HHW) facility is needed. This is a minor investment to improve traffic flow and safety and could be completed in the near future.
2. A steel backsplash and chute along the east side of the building in the loadout tunnel should be added. This backsplash will protect the siding from damage caused by loading trailers. It should also reduce the possible spillage of waste from the top-load operation. Also, adding a short push wall on the tip floor side to increase surge capacity should be considered.
3. To increase capacity and provide long-term services the station should be expanded in the next five years. This would include expanding the transfer station building and paving to accommodate additional traffic. The new building can include a lean-to on the north side to provide storage of special waste.
4. In the Long-term, the entrance road can be widened to increase the capacity of the scale complex and reduce the potential of traffic backing onto Grant Street.

## Chapter 5 – North Area Service Options

Three options were evaluated to address the current traffic deficiencies of the existing CTR facility as well as to manage the increased waste volume from the expected population growth.

Option 1 – Upgrade and expand CTR to accommodate volume capacity to 2040. The estimated cost is $14M to $17M.

Option 2 – Minimal improvements to CTR and construct a new satellite transfer station to serve the northern part of Clark County. The estimated cost is $14M to $16M.

Option 3 – Replace CTR with a new transfer station at a different location for an estimated cost of $25M to $30M.

***Findings***

1. Construction costs needed to build the infrastructure for serving the north region of the County is estimated to range from $14M to $17M for Options 1 and 2 to as much as $30M for Option 3, assuming a new transfer station is sited.

2. Making major improvements at CTR (Option 1) is estimated to be the lowest overall operating cost for managing the waste generated over the next 15 years. The cost to make these improvements is estimated to be about $17M. This does account for the cost of purchasing the adjacent parcel needed for this expansion. The adjacent parcel located on the west side is owned by WCW. The parcel is part of a former closed landfill, and this option assumes the underlying soil conditions are suitable for building structures. Further analysis is needed to verify these conditions. Also, the adjacent properties on the north and west sides of CTR include new residential developments. It is assumed land use permits will need to be obtained for this expansion. The major improvements prepared as part of this study have demonstrated that CTR can be constructed in phases to keep the facility operating during the construction period.

3. Both Option 2 and 3 are reasonable solutions for meeting the long-term service needs but both will require siting a new facility. County zoning does allow transfer stations to be approved on most zones through a conditional use process.

4. In addition to cost, other considerations may impact the decision for serving this area, including the expansion of residential development adjacent to CTR, ingress and egress limitations for customers off Hwy. 503, and potential issues related to underlying soil conditions on the adjacent west property that could impact the expansion of CTR.

## Chapter 6 – Capital Needs Assessment and Financial Analysis

The conditions assessment presented in Chapter 4 and the North Area Service Options in Chapter 5 resulted in defining the needs for making capital improvements to the three transfer stations. Conceptual plans were prepared for both CTR and Washougal. For West Van, the improvements for new equipment for the MRF are listed, but no concept plans were developed. Instead, it is recommended that a master site plan be prepared for the complex once a decision for a new MRF processing system is made.

***Findings - Capital Improvements Needs***

1. The County will need to decide on the long-term solution for serving the north-central part of the County

either by planning further expansion of CTR or by siting a new transfer station.

2. Over the next 10 years, the County and its partners will need to invest an estimated $25M to $50M to upgrade and expand the existing transfer stations and MRF. The broad cost range reflects the fact the County could decide to replace CTR and build a new transfer station.
3. Phase 1 of the CTR improvements includes extending the inbound traffic lane and adding a new scale on the west side property. The improvements will eliminate inbound customer traffic from queuing onto Hwy. 503. This could also include building an access ramp to the south end of the existing transfer station. This improvement is estimated to cost about $3M assuming the underlying soil conditions of the adjacent west property are acceptable.
4. Improvements to upgrade and expand the Washougal Transfer Station at an estimated cost of between $1M and $2M will need to be made over the next five years.
5. CRC has made some initial improvements to the West Van MRF processing system that will enhance system performance. In the long term, a new processing system will be needed.

***Findings - Financial Analysis to Address Capital Improvements Needs***

The JRMA project team completed a review of the total cost of operating the regional system. Working in cooperation with WCW, the financial analysis examined the current cost of operating the system for 2019. The purpose was to determine the actual cost of just operating the transfer station and recycling facilities. The financial review was conducted within the guidelines provided for in the contract between the County and WCW. The analysis provides information that will enable the County to evaluate impacts on rates for making capital improvements.

1. The total cost of operating the three transfer stations is reported to be $8.9M in 2019. This includes full services from operating the gatehouses, managing traffic and waste volumes, and loading into transfer trailers. It also includes CRC's internal transport operations to shuttle boxes and stage rolling stock and maintaining the physical infrastructure at each facility. It does not include long haul transportation to either the Wasco Landfill in The Dalles, Oregon by truck or Finley Butte Regional Landfill in Boardman, Oregon by barge.
2. Based on the financial information provided it appears that the transfer stations have been fully depreciated. However, there may be some equipment still being paid for by CRC.
3. The current rates generate revenue well above the current cost to operate the transfer station system and for transport and disposal of waste. Assuming facilities have been fully depreciated and paying the vendor an operating margin of 15%, the current rates generate about $5M in surplus revenue that could be allocated to make capital improvements at facilities. Over a ten-year period, this would generate approximately $50M.
4. Establishing a dedicated capital improvement fund with funds generated from current revenue would negate the need to borrow monies for the needed capital improvements.

## Chapter 7 – MRF Feasibility Report

The County and each of the cities offer a range of recycling services to residences and businesses. The primary service is the collection of commingled recyclable materials from single-family and multi-family residences. The materials collected are taken to the West Van MRF to be processed for delivery to markets. The current equipment used to process recycled materials has been in operation since 2008.

Recognizing the importance of maintaining and potentially expanding recycling programs the project team completed a thorough review of the MRF operating system. This assessment evaluated both the physical condition and the operating performance of the equipment line. As part of this assessment, the team considered the impacts on markets for recycled materials resulting from China's decision to restrict imports of materials (aka. The China Sword).

***Findings of MRF Feasibility Study***

1. The current equipment line has been well maintained and relies largely on the use of outdated technologies. This, combined with demand by markets for higher quality materials, results in operating the system on average at 15 tons per hour (TPH) well below the design rate of 20-25 TPH.
2. Currently, the County generates about 60,000 TPY of recycled materials. The current diversion rate is about 67% with 33% of the materials received being transported to landfills. The rate of discards or contaminants is a result of two factors. One, the amount of non–recyclable material being collected from generators of recycled material must be reduced. Two, the MRF processing line will need to be upgraded to improve performance to produce higher quality materials at a reduced cost.
3. The assessment identified a list of potential equipment to be installed to improve performance and reduce cost. CRC has since installed several robotic units and added optical sorters that have contributed to reducing operating costs.
4. The County should begin planning to have a new equipment line installed. The retrofits to the existing process line will provide short-term benefits for processing current materials but will need to be replaced with a new system employing more advanced technologies to be more cost-effective and recover more materials.
5. The feasibility study considered several options for replacing the current process line. They included the following:
    a. Install a new equipment line at West Van
    b. Site and build a new MRF facility to be centrally located in relation to where recyclables are generated and collected.
    c. Converting CTR to a MRF facility and siting a new transfer station to serve the north/central County area.
6. Installing an advanced processing system is estimated to cost between $15M and $18M and would result in reducing the unit operating cost from an average of $127 per ton to an estimate of $100 per ton assuming the current materials (i.e., 60,000 TPY).
7. A new MRF equipment line at a more central location would be the most cost-effective option, assuming the County and its operator could increase the number of materials being processed. The feasibility analysis considered the cost if the number of materials processed was to be increased to 100,000 TPY. This would mean importing materials from other jurisdictions or processing other materials such as high-grade commercial loads.

## Chapter 8 – Summary: Key Findings and Recommended Actions

Completion of the Phase 1 of the RSWSS provides a list of key findings for the County and cities to review and decide what facility improvements are needed to manage the region's solid waste system and recyclables for

the next 20 years. Although the three transfer stations have been well maintained there have been no significant investments at either CTR or West Van in over 25 years. The Washougal Transfer Station was constructed in 2009.

Since the construction of these facilities, the population of the County has more than doubled. Over the past 10 years, the amount of waste being generated increased from 230,000 tons in 2010 to nearly 400,000 TPY in 2020, an increase of 75%. OFM projects Clark County's population may grow to as many as 612,000 people or a 22% increase by 2035.

The three transfer stations operating today were not designed to handle the current volume of traffic and waste quantities being received. Decisions to make improvements have been stalled by the current contractual arrangements with CRC. The County has notified CRC of its intent to extend the operating contract for five years as stipulated in the current agreement. No decision has been made regarding the question of ownership. The County has the right to purchase the transfer stations by notifying CRC prior to December 31, 2025.

***Findings***

1. The County and local jurisdictions will need to invest between $25M to as much as $50M in the solid waste system to efficiently manage the current and future waste projected from growth.
2. CTR has made improvements to help mitigate ingress and egress from Hwy. 503, but this will not eliminate customers from stacking into Hwy. 503. The Phase 1 Report includes concept plans to improve and eliminate this condition.
3. The revenue generated from the current rates can provide sufficient funds to pay for necessary capital improvements over the next ten years.

***Description of Scenarios for System Improvements***

The Phase 1 Report has identified three scenarios for developing the infrastructure needed to meet the needs of the solid waste system for the next 20 years. In addition to the capital improvements required for the system, it provides the background information necessary to understand the critical issues related to the current contract extension and system ownership.

Each scenario is described and accompanied by a preliminary cost estimate to construct the improvements. A list of advantages and disadvantages is also provided for decision-makers to consider when comparing one scenario vs. another.

**Scenario 1 – Upgrade all Existing Facilities to Serve the County**

This scenario is based on the decision to upgrade all existing transfer stations and retain the MRF operations at West Van. It reflects the assumption that the current facilities are located adequately to satisfy the long-term needs of the solid waste systems and makes no changes that would affect the collection services.

1. **Limited expansion of the CTR to serve as the primary transfer and recycling facility for the next 20 years.**

   This Report identified several options for making improvements to CTR, so it can operate more efficiently and handle the impacts from growth in this part of the County. The preferred option will require gaining approval to expand onto the adjacent property west of the existing site. The adjacent property is a closed construction and demolition landfill. Before any new structures are built, the environmental and subsurface conditions will need to be investigated further. Land use approval of an expansion will need

to be completed. New residential developments have been built on both the north and west sides of CTR potentially complicating efforts to permit expansion of the facility onto this property.

**CTR – Improvements to expand the current structure; and improve circulation to eliminate off-site queue** **$14M to $17M**

2. **Expand Washougal Transfer Station**

   The Washougal Transfer Station is experiencing the impacts of growth in both Camas and Washougal and the eastern part of the County. The building will need to be expanded to manage the increase in customer traffic and the amount of waste received. The cost for making improvements is estimated to range from $1.5M to $2M.

   **Washougal TS Improvement** **$1.5M to $2M**

3. **West Van MRF Improvements**

   There are no immediate capital needs to expand the West Van Transfer Station. The facility can handle the customer traffic and waste received in the near future. However, space is limited for handling other waste streams in particular food waste that is collected from select generators as part of a pilot program. It is expected that the food/organics waste streams will expand as programs to separate food waste expand. The report has recommended that a master plan for the entire site be prepared to consider how this valuable resource can be developed to handle other waste streams such as food waste and construction/demolition debris.

   In this scenario, the plan would be to replace the existing MRF processing equipment line at West Van. As the old system is removed and new equipment is installed, the County would be required to transport commingled recyclables out of the County to other MRFs operating in the region (Estimated 9 to 12 months). This cost is not included in this analysis.

   **West Van Improvements** **$4M to $6M**

**Scenario 1: Total Estimated Construction Cost Over Next 10 Years** **$19.5M to $25M**

**Scenario #1 System Impacts**

Upgrading all existing facilities appears to be the most expedient approach for system improvements and initially requires less capital than the other scenarios. Collection services will not be impacted and will remain as is current. It does not improve collection services for commingled recycled materials that must travel to West Van to unload. As the north/central portion of the County continues to grow, more collection vehicles will need to make the trip to West Van to unload possibly twice a day.

Expanding CTR onto the adjacent property may encounter challenges from neighbors to develop this property given the changing nature of the area. Also, in the future, all customers leaving the site must turn right. The customers traveling from the north county will need to travel south on Hwy. 503 and find a new route for return to their origin.

***Advantages***

1. Requires the least capital cost
2. Does not require siting any new facilities in the near future
3. Makes use of existing facilities

***Disadvantages***

1. Access to CTR off Hwy. 503 is less than ideal
2. CTR will continue to operate adjacent to residential properties
3. Land use approval of CTR expansion may have challenges
4. MRF at West Van requires the longest travel times for commingled collection trucks
5. When a new recycling processing line is installed at West Van materials will need to be transported to an out-of-County MRF facility for 9-12 months
6. Provides no space for new facilities that may be needed to process organics or construction and demolition waste, or other infrastructure identified by CSWMP
7. West Van facilities may need to be expanded in the future

**Scenario 2 – Upgrade CTR and Washougal – Build a New MRF**

This approach is based on expanding CTR but recognizes the benefit of building a new MRF at a central location to be determined. It also allows the space vacated by removing the MRF processing equipment at West Van (approximately 45,000 sf of enclosed space) to be used for other purposes to meet the future needs of the solid waste system. Examples include processing organics and/or processing construction and demolition waste at West Van.

| | |
|---|---|
| **1. Build a New MRF for Recycled Materials** | **$25M to $30M** |
| **2. Make Improvements at CTR and Washougal per Scenario 1** | **$15M to $19M** |
| **Scenario 2: Total Estimated Construction Cost Over Next 10 Years** | **$40M to $49M** |

**Scenario #2 System Impacts**

This approach continues the theme of upgrading and expanding CTR and Washougal Transfer Stations. It recognizes that locating a new MRF in a more central location may result in the least transportation cost to the system in the long term. It requires time to site and build a new facility and therefore will require additional capital investments. Assuming the County would contract this to a private vendor, the vendor would be responsible for siting and building the facility.

***Advantages***

1. Makes use of existing transfer stations
2. If centrally located the new MRF should reduce costs attributed to collecting comingled materials (Preliminary estimate is about $1M per year based on current collection services)
3. Processing recyclables at West Van can operate while a new processing system is installed at the new MRF
4. Provides flexibility by creating space at West Van that can be re-purposed for future options

***Disadvantages***

1. Requires the largest capital investment of the three scenarios
2. Access to CTR off Hwy. 503 is less than ideal

3. CTR continues to operate in a residential environment
4. Land use approval of expansion may have challenges
5. Requires siting a new MRF facility

**Scenario 3 – Build New Transfer Station to Serve North/Central County and Convert CTR to MRF**

This approach is based on siting a new transfer station to replace CTR. It recognizes the current CTR site is not the best location given the disadvantages listed in the previous scenarios. Several factors weigh into such a decision. First, direct access off Hwy. 503 is less than desirable given high traffic volumes. Second, the surrounding neighborhood has been developed with more residential property adjacent to the station. Third, expansion of the facility will require building on the adjacent old landfill property on the west side. Rather than retrofit CTR with less-than-ideal conditions, the County would proceed with a siting study to identify a suitable property for developing a new transfer station. Once the new transfer station is operational (est. five years), CTR would be converted to a new MRF. After the new equipment line is installed at CTR the old system at West Van would be removed and the space at West Van can be re-purposed (approximately 45,000 sf).

| | |
|---|---|
| **1. Build a Transfer Station** | **$26M to $30M** |
| **2. CTR – Phase 1 Circulation and Traffic enhancements** | **$3M** |
| **3. Retrofit CTR to MRF** | **$7M to $8M** |
| **4. Washougal TS Improvements** | **$1M to $2M** |
| **Scenario 3: Total Estimated Construction Cost Over Next 10 Years** | **$37M to $43M** |

**Scenario #3 System Impacts**

This scenario requires the County to site a new transfer station. It also takes advantage of the current infrastructure by converting CTR to an MRF. This will result in CTR receiving only commingled collection trucks (less than 100 vehicles per day) versus the current customer traffic (800 to 1,000 vehicles per day). The facility will receive only recycled materials five days per week with, possibly, a few trips on Saturday. This will have a significant positive safety impact on traffic on Hwy. 503 over the current conditions. Also, the adjacent residences will not be impacted by the traffic at the gatehouse and operations into evenings and on weekends.

Locating and permitting a site to build a new transfer station will require time to gain approval and permits but may be best in the long run. First, it can be built to handle the customer traffic expected from population growth and manage the future waste volumes generated in the North County region. A new site can potentially be developed in a more commercial/industrial area that has good access to arterials and primary collector streets.

***Advantages***

1. Makes use of existing transfer stations
2. Requires less capital than scenario 2
3. When the new transfer station is operational CTR can be converted to a MRF only operation
4. Existing MRF can continue to operate while CTR is converted avoiding transportation of recyclable materials to an out-of-country facility
5. CTR MRF is centrally located and can reduce costs attributed to collecting commingled materials
6. Provides flexibility by creating space at West Van that can be re-purposed for future operations

7. Has the potential to provide the lowest system cost by building a new more efficient transfer station and reducing overall system collection and transportation costs
8. Eliminates safety risk of having high customer traffic access off Hwy. 503
9. Avoids development onto the adjacent property at CTR

***Disadvantages***

1. Requires more capital than scenario 1
2. Requires time to site and permit new transfer station

## Phase 1 Recommendations

Each of the scenarios described will provide the necessary infrastructure for managing solid waste and recyclables for the next 20 years or longer. The decision of which scenario to implement will require input from stakeholders and a decision regarding future ownership. The following recommendations can be reviewed and considered while work is in progress on Phase 2. The Phase 2 work is designed to provide additional information to aid in making final decisions on the preferred scenario.

1. The County should establish a fair operating margin to compensate CRC for continuing with operations of solid waste facilities for the next five years or for a set period to be determined.
2. Revenues generated above the cost of services plus the established operating margin should be remitted to the County. The remitted revenues will be encumbered for future solid waste system facilities and improvements.
3. The County should establish a facility Renewal and Replacement (R&R) evaluation process and a dedicated fund that will maintain system assets.
4. The County should approve funds for implementing Phase 1 of the CTR site improvements to eliminate any potential for inbound customers from queueing onto the public right of way on State Hwy. 503. The improvements include extending the entrance road and new scale onto the adjacent property located west of the current transfer station. Details of these improvements should be negotiated as part of the contract extension.
5. The County should establish a minimum rate for all customers using the transfer stations. Under the current tip fee policies, customers that bring less than 300 pounds are not paying the cost of services. Implementing this policy may also provide an incentive to subscribe to regular collection services or cause customers to make fewer trips by consolidating their loads.
6. The County should extend the hours of operations at both the West Van and Washougal transfer stations.

## Phase 2 Study

The results of the Phase 1 Report have detailed specific operational and master planning questions that need to be addressed as part of developing and implementing a 10-year CIP. The key questions to be answered are as follows:

- Should CTR continue to operate as the primary transfer station over the next 20 years or should a new transfer station facility be built?
- Should the MRF continue to operate at West Van or should the MRF be sited at a more central location

to where materials are generated thus reducing overall collection and transportation costs and using the vacated space for other system needs?

The County and the cities are currently negotiating to extend the contract with CRC until December 31, 2026. The negotiation is expected to clarify the direction the County will take regarding future ownership of the system. Negotiations should determine how the future capital improvements will be paid for under the current rate structure.

Phase 2 of the Regional Study includes the following tasks to provide additional information for decision-makers.

1. Complete the search to locate a new transfer station to serve the north/central parts of the County. The siting study should identify the preferred site for building a new station.
2. Complete subsurface investigations on the property west of CTR to determine the conditions or limitations for consideration of the option to expand CTR.
3. Complete the CSWMP. A priority of the CSWMP will be to identify needs for additional facilities for managing waste in the future. Two items that have been discussed while completing the Phase 1 Report are the need to manage food waste as part of a regional organics management strategy and providing facilities to handle construction and demolition waste.
4. Complete a detailed plan for expanding the Washougal transfer station.
5. Complete the Renewal and Replacement /CIP financial plan for the regional system.

Phase 2 of the Regional Study is expected to be completed within the next 24 months and will be coordinated with Phase 3 – Update of the CSWMP.

# **Appendix B: Basis of Master Plans:** West Vancouver Materials Recovery Center, Central Transfer and Recycling, Washougal Transfer Station

# West Vancouver Materials Recovery Center Facility Master Plan

## *Basis of Master Plan Report*

Prepared by JRMA
February 7, 2023

***Introduction***

This document reviews the findings from the 2021 Phase 1 Regional Solid Waste System Study (RSWSS) and establishes information needed to consider what improvements/modifications and used to prepare a master plan for the West Vancouver Materials Recovery Center (West Van). Preparing a master plan for West Van was a key recommendation from the RSWSS. Please see **Appendix A** for a summary of the findings and recommendation from the RSWSS for the West Van facility. The master plan will identify the infrastructure required for managing solid waste and recycling services over the next 20 years.

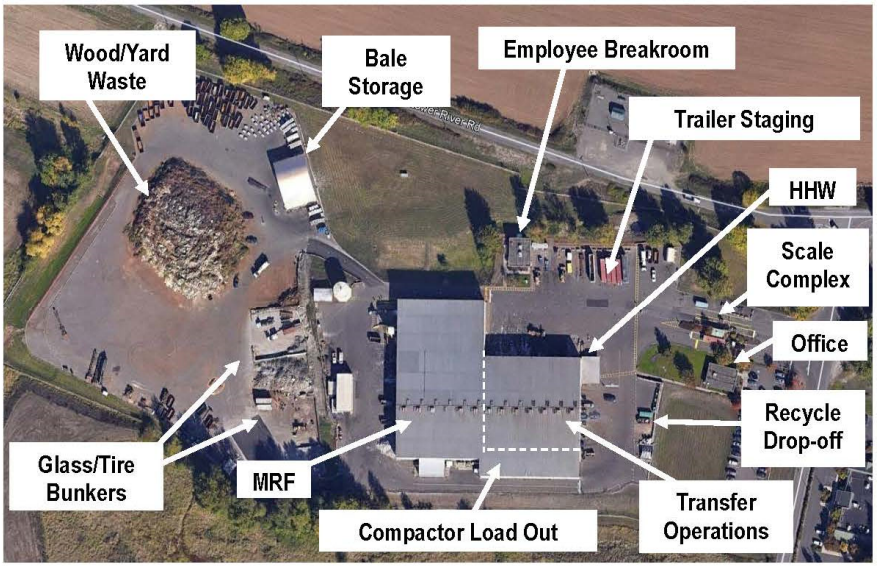
In Phase 1 RSWSS an assessment of the conditions of the West Van was conducted. Some minor repairs are required but primary structures appear in good condition. Based on the current negotiations with Columbia Resource Company (CRC), it is understood the MRF will be relocated to another site within five years (January 2028).

***Background and Existing Conditions***

West Van is located on a 21+ acre site off Old Lower River Road at the Port of Vancouver. It was constructed in 1993 to receive municipal solid waste (MSW) from commercial collection trucks and self-haul customers. MSW is loaded into containers that are shuttled 0.5 miles to a barge loading facility located on the Columbia River. Waste is then barged more than 200 miles to the Finley Buttes Regional Landfill in Boardman, Oregon.

The property includes a large 91,100 square foot (sf) pre-engineered metal building (PEMB) that receives waste from self-haul customers and Waste Connenction of Washington (WCW) collection trucks from residential and commercial accounts. The transfer operations occupy 46,000 sf of the structure while the MRF receiving and processing operations use the remaining 45,100 sf.

**Figure 1: West Vancouver Recovery Center**



In addition to the transfer station and MRF operations, West Van provides approximately seven acres on the north side of the site for managing other waste streams. This includes space for receiving and processing yard debris and wood waste and dedicated bunkers to receive mixed glass and inert waste such as concrete and rock deposits. Tires are also received and temporarily stored before being transferred for processing. It also provides supplemental storage for baled materials in a canopied area and for parking rolling stock and container storage. These operations are performed outdoors except for the bale storage canopies.

***West Van Waste Quantities***

The West Van facility receives 30% of all waste generated in the County. As shown in **Table 1** the total amount of waste received from 2016 to 2021 has increased marginally from 102,798 tons per year (TPY) to 116,719 TPY or 14%. This may be attributed to the fact that most of the growth in the County is occurring in the central portion of the County and in the cities of Battle Ground and Ridgefield. **Figure 2** shows the year-over-year growth in tons and vehicle trips.

Based on recent history, West Van receives an average of 400 tons per day (TPD) and peaks can be 450 TPD. Assuming 30 tons per shipping container and a filling of three compactor loads per hour, all waste can be removed to be barged in five to six hours.

However, the number of trips entering the facility has increased by 53% mostly due to an increase in cash customers from 39,000 in 2016 to over 64,000 in 2021 or 66%.

**Table 1: West Van Historic Waste Quantities and Traffic**

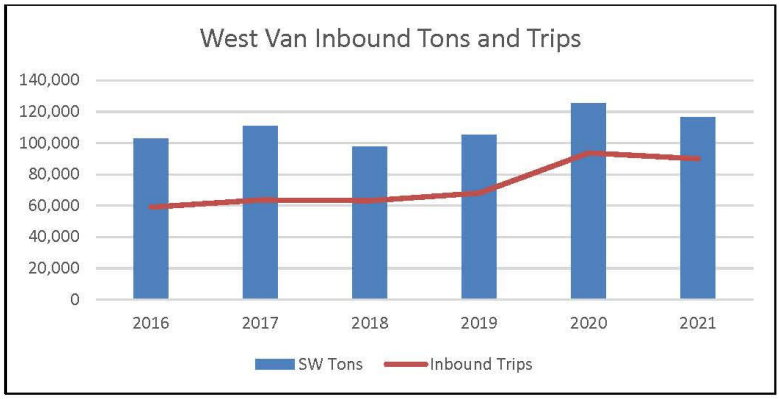
| West Van | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Tons** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021** | **5 - Year Av.** |
| Cash | 15,683 | 19,732 | 17,694 | 17,841 | 22,742 | 26,620 | 20,926 |
| Commercial | 43,564 | 44,380 | 38,335 | 30,361 | 16,107 | 18,971 | 29,631 |
| Route Trucks | 21,172 | 22,955 | 21,838 | 31,495 | 51,765 | 42,128 | 34,036 |
| WCW Drop Box | 22,379 | 23,798 | 19,925 | 25,602 | 34,633 | 28,999 | 26,591 |
| **Total Tons:** | **102,798** | **110,865** | **97,792** | **105,299** | **125,247** | **116,719** | **111,184** |

| **Inbound Trips** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021** | **5 - Year Av.** |
|---|---|---|---|---|---|---|---|
| Cash | 39,003 | 42,805 | 43,299 | 45,674 | 66,591 | 64,556 | 52,585 |
| Commercial | 10,951 | 11,425 | 11,197 | 10,802 | 10,839 | 11,247 | 11,102 |
| Route Trucks | 2,766 | 2,877 | 2,926 | 4,134 | 6,430 | 5,585 | 4,390 |
| WCW Drop Box | 6,340 | 6,569 | 5,809 | 7,465 | 9,839 | 8,599 | 7,656 |
| **Total Trips:** | **59,060** | **63,676** | **63,231** | **68,075** | **93,699** | **89,987** | **75,734** |

Whereas the increase in the total amount of waste received has minimal impacts on operations, the increased number of cash customers creates bottlenecks in day-to-day operations. First, there is limited stacking/queue space before and after the scales; and second there are limited number of stalls for cash customers to unload. The impacts create congestion in site circulation that must be managed for keeping operations safe.

Tons received and traffic volume at West Van were updated with 2021 data. **Figure 2** illustrates that both waste received and number of trips to the transfer station declined from 2020, however remain above the previous four years.

**Figure 2: West Van Inbound Tons and Trips**




In **Figure 3** the estimated service areas for each transfer station are shown. The estimated service area for West Van is shown in light tan and overlaps in service areas with both CTR and Washougal. The hatched areas are projected for the expansion of the urban growth boundary as reported by Clark County Growth Management Plan. It demonstrates that the West Van service should experience an increase in density in future years thus the waste volume delivered should increase.

**Figure 3: Map of County with Annexation**

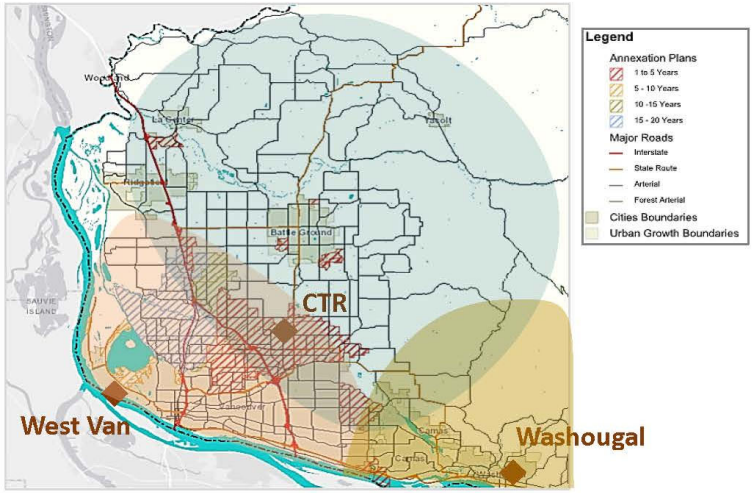


**Table 2** below shows that the County will generate an additional 106,000 TPY by 2040. Depending on the assumption of how much of this waste is generated in the West Van service area, one scenario shows that 20% of the increase will be received at West Van.

**Table 2: Estimated Service Area Waste Projections**

| Transfer Station Service Area | Assuming 50% UGB Growth in Central Area | | | Assuming 70% UGB Growth in Central Area | | |
|---|---|---|---|---|---|---|
| | Population | % Change of Waste | Additional Waste (TPY) | Population | % Change of Waste | Additional Waste (TPY) |
| Service Areas | | | | | | |
| *Growth in City of Vancouver in North/Central County* | 40,961 | | 41,780 | 57,706 | | 58,860 |
| *Growth in Unincorporated North/Central County* | 49,227 | | 50,212 | 49,227 | | 50,212 |
| *Growth in North Cities* | 26,968 | | 27,507 | 26,968 | | 27,507 |
| **CTR Service Area:** | **117,156** | **54%** | **88,734** | **133,901** | **62%** | **101,416** |
| *Growth in City of Vancouver (25% of City & County)* | 20,840 | | 21,257 | 20,480 | | 20,890 |
| *Growth in unincorporated East County – Assume 20%* | 19,112 | | 19,494 | 19,112 | | 19,494 |
| *Growth in East Cities* | 18,748 | | 19,123 | 18,748 | | 19,123 |
| **Washougal Service Area:** | **58,700** | **27%** | **44,459** | **58,340** | **27%** | **44,187** |
| **West Van Service Area:** | **40,961** | **19%** | **31,024** | **24,576** | **11%** | **18,614** |
| ***Total:*** | **216,817** | **100.0%** | **164,217** | **216,817** | **100%** | **164,217** |

When the estimated increase in waste from growth is added to the current West Van waste received in 2019, the total waste would be about 125,000 TPY or 20% increase.

Using these preliminary projections, the increase in waste received at West Van is not that significant. However, additional space on the tip floor is needed to manage surges in waste quantities and perhaps an additional compactor to load containers. With just one compactor that means that when the compactor is out of service for repair there is no backup system. Also, the facility needs to be retrofitted to provide additional stalls for cash or self-haul customers to unload.

***Transfer Station Conditions Assessment***

In Phase 1 RSWSS a conditions assessment was conducted in 2019. From this review it was determined there were no immediate facility deficiencies to be addressed. The main transfer station and MRF structure were determined to be in good condition. However, many of the support structures were constructed in the 1990s and may be obsolete or in need of major renovation in the longer term. It was recommended that a site Master Facilities Plan be prepared to consider what improvements were

needed to existing facilities and what modifications and expansions were needed to address long term solid waste services for the regional system.

Since this assessment there are several new developments that need to be considered in preparing a master plan as follows:

1. Based on current negotiations with CRC it is expected the MRF will be relocated to another site.
2. The 2020 census data reveals the population in Clark County is higher than previous data and projections.
3. The number of stalls for unloading will need to be increased. The number of cash customers using the facility has increased significantly in the last two years. In 2021 the number of cash customers increased to about 65,000, an increase of 20,000 vehicles.
4. The State has passed new legislation requiring local governments to reduce the amount of food waste being disposed of in landfills.
5. The current food/yard waste collection programs in the City of Vancouver continue to grow and the City of Ridgefield has also started a similar program. This will require more space to be dedicated to handling food waste and/or mixed organics.
6. The City and County are considering public ownership options for the regional transfer station system.
7. The City has extended water service to this area. Assuming the facility can connect to provide water service the existing well and pump system can be replaced and relocated.

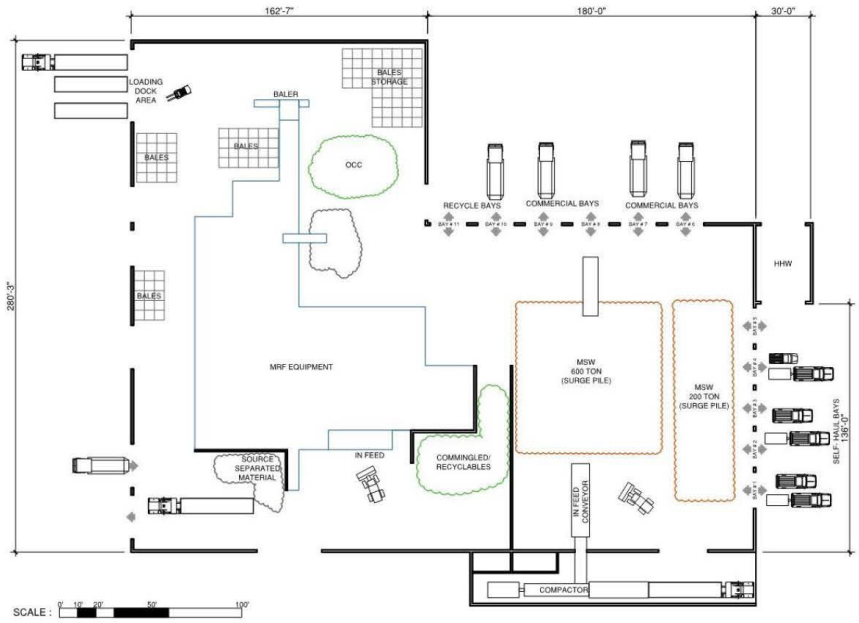
These new developments need to be included in updating the operational assessment and considered in preparing facilities plan for addressing the long-term service needs of the solid waste system.

***Existing Tip Floor Operations***

Since the facility was constructed in 1992 there has been no major expansion to the transfer station tip floor area. When the facility was first opened the total amount of waste generated in the County was 173,000 TPY or about 600 TPD. When CTR was opened in the early 1990s most of the County's waste was delivered to CTR. In 2021, West Van received over 116,000 tons of waste or roughly 30% of all waste generated in the County. The percentage of waste received at West Van has remained fairly constant over the past six years. Assuming West Van continues to receive a similar percentage of the total waste generated, by 2040 the total waste delivered to West Van is estimated to be about 138,000 TPY or 450 TPD. This is consistent with the service area analysis presented previously.

The current tip floor arrangement shown in **Figure 4** demonstrates that the facility does have sufficient space to receive and temporarily store 450 TPD. However, the amount of space needed is dependent on the load out capacity or time needed to remove all waste from the tip floor. A single compactor can load a container/trailer with 30 tons of waste in about 25 minutes or about 60 TPH. The amount of waste for each container could be more or less than 30 tons depending on the materials being loaded. It would take eight hours of continuous loading operations to remove 600 tons, and does not include interruptions in services whether it be equipment downtime or availability of containers to load. Also, West Van has no contingency if the compactor is out of service for extensive repairs.

**Figure 4: Existing West Van Floor Plan**




Another factor related to the capacity of the transfer station is the number of stalls available for customers to unload. As shown in **Figure 4** there are currently five-20 ft roll up doors (referred to as Bays 1-5) located on the south side of the building for self-haul or cash customers to unload. Each door opening may accommodate two self-haul vehicles to unload thus providing 10 stalls to unload. However, the door farthest to the west (Bay 1) is currently dedicated to accepting mixed food waste and yard debris collected in both the Cities of Vancouver and Ridgefield and is not available for self-haul customers. Bay 5 is limited for unloading as it must remain unavailable when the household hazardous waste (HHW) is open to accept materials. This leaves only three bays and six stalls that can be used to unload self-haul customers. Based on information in the Phase 1 RSWSS, during peak hours from 9 a.m. to 3 p.m. West Van experiences between 40 and 45 vehicles per hour. On average the typical self-haul customer will use 10 minutes to unload including the time to back in and exit. This means that a stall can handle five vehicles per hour. With only six stalls available on a consistent basis, the facility can handle on average, thirty vehicles per hour, which is much less than what is needed.

The County is considering opening West Van to self-haul customers on Sundays which may result in spreading out the current volume. It could result in more traffic particularly if some of CTR's current customers decide to use West Van. If all doors are dedicated to accepting self-haul customers, it appears there would be 10 stalls available and sufficient to handle the current volume of customers. But

changes to the circulation pattern should be considered to assure there is adequate queue space between the scales and the stalls.

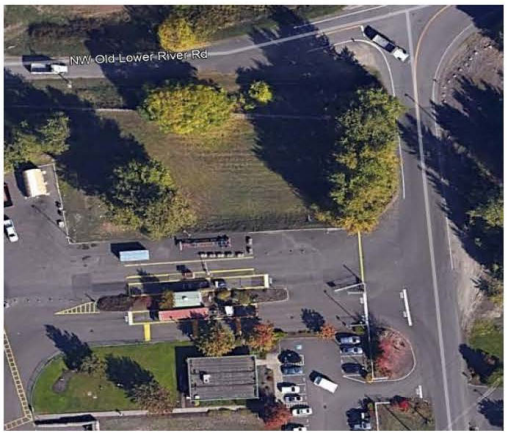
On the east side of the transfer station there are six-20 ft doors (referred to Bays 6-11) for collection trucks to unload. One bay is used for access of the front loader equipment. All compactor and roll off trucks hauling waste use three bays (Bays 7-9) thus providing four to six stalls to unload. These vehicles will unload in approximately five minutes thus, conservatively each bay can receive about eight vehicles per hour. Currently, 50 to 60 collection trucks enter the facility each day with possibly 16 vehicles at peak hours. Thus, a minimum of three stalls will need to be available.

Bays 10 and 11 are used by trucks with commingled recyclables that serve the entire County. There are about 60 collection trucks with recyclable materials that arrive at West Van five days per week. A few trucks (less than 10) also deliver recyclables on Saturday. As long as the MRF continues to operate at West Van these stalls must remain dedicated to unloading the recycling collection trucks. If the MRF is relocated, then these stalls can be used by other customers.

***Existing Traffic Circulation***

Access to the West Van facility is from a local service road used by several local businesses including the barge loading operations to transport waste to the Finley Butte Regional Landfill. The facility entrance is just 200 ft west of NW Old Lower River Road. All traffic entering and exiting the facility uses this one access point as shown in **Figure 5**.

**Figure 5: West Van Entrance and Scale Complex**




When entering the site all traffic is directed to a single scalehouse complex that has three inbound and two outbound lanes. All inbound customers must use a single lane with a scale to weigh in. CRC recently installed a second scale dedicated to allowing commercial collection trucks to use a separate lane to weigh in. The third lane is a bypass lane used by transfer trailers and commodity trucks to enter the facility without being weighed. The commodity trucks are used to ship recycled materials to markets.

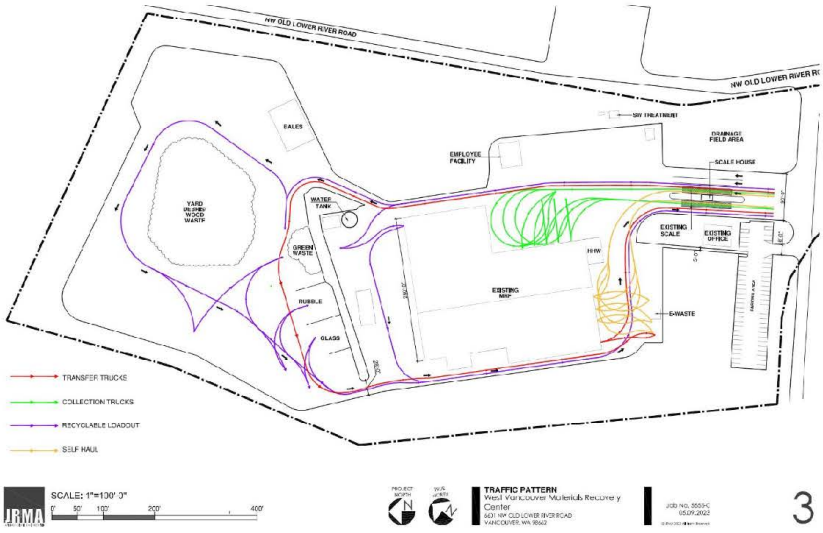
After weighing in the scale complex self-haul customers are directed to turn left where they queue up for an available stall to unload at the transfer station. Self-haul customers can also access either or both the recycling and HHW waste drop off areas. WCW collection trucks will enter the same access lane and proceed to unload on the east side of the transfer station and MRF.

Currently, traffic can back up off the service road and onto Old Lower River Road. Since this road has very little through traffic it does not create a significant congestion problem at the intersection, but it is not a desirable conditon. The new scale serving the commercial trucks will help to relieve the potential for backup onto the Old Lower River Road.

All traffic including self-haul customers, collection trucks, transfer trailers, and commodity trucks must exit at this same entrance. Vehicles that need to weigh out use the outbound scale lane while other vehicles can use the bypass lane.

The site circulation near the entrance is quite congested at times. This is a result of the close proximity of the entrance to the main transfer station building and where vehicles unload. It is further complicated due to the location of the HHW and the recycle drop off area. Site circulation for the various customers using the facilities has evolved over the many years of operations as new services and programs have been adopted. **Figure 6** captures the complexity of traffic patterns.

**Figure 6: West Van Traffic Patterns**



## Master Plan Considerations

### Near Term Issues

1. A critical need is to establish the location and facilities needed for top loading operations. An immediate need is to have capabilities to top load food waste/mixed organics.
2. Extend the city waterline to provide water service and replace the current ground water pump and tank system used for fire suppression.
3. Consider the location for the second compactor.
4. Develop plans to reduce congestion and eliminate offsite queue issue.
    a. Consider adding a new access for transfer trailers/containers off Old Lower River Road.
    b. Consider a new exit road for containers being shuttled to the barge facility.

### Longer Term Issues

The West Van facility is located on 21 acres. The back seven acres are currently used for receiving and processing yard debris and wood waste. It also includes a bale storage structure and container/bin storage and other support activities. The County should consider how this space can best be used to provide waste management and recycling services in the future.

Also, the MRF processing operations are expected to be relocated to a new facility. Once the equipment line is removed the space can possibly be used for other servceis. Options may include:

1. Receive and process C/D materials.
2. Process organics – including food waste, green waste, and wood waste.
3. Other operations as deemed necessary for providing waste management and recycling services.

#### *Organics Management*

The State of Washington recently passed HB 1799 that directs local jurisdictions to reduce organic materials disposed in landfills by 75% before 2030. In 2021, the County generated 415,000 tons of MSW. Based on a waste composition study preapred for the City of Tacoma (2014) food waste represents about 20% of MSW. Using this data indicates the County discarded of 83,000 tons of food waste in 2021. If 75% is removed, the County would need to find an alternative for 62,000 tons of organics. The volume of organics collected at West Van would be about 35,000 tons in 2040.

West Van received 23,000 tons of yard debris and wood waste in 2021. Of this total, 11,800 tons were reported to be received from Portland Metro. Therefore, only 11,200 tons of these organic materials were collected in the County. The facility also received almost 1,500 tons of source separated food waste inside the transfer station. These materials are processed and then transported to the Dirt Huggers Compost Facilty. One component of the West Van master plan will be to evalaute options for managing organics in response to this new legislation.

*Basis of Master Plan Data*

Based on the findings from Phase 1 RSWSS (**Appendix A**) and the recently passed HB 1799, the design data in the following **Table 3** and **Table 4** is recommended to be the basis of the West Van Master Plan.

**Table 3: West Van - Basis of Master Plan Data**

| Category | | Existing | 2040 Projection | % Change |
|---|---|---|---|---|
| **Waste Quantities (MSW)** | | | | |
| Annual | Tons | 116,719 | 150,000 | 29% |
| Ave Daily | Tons | 400 | 550 | 38% |
| Peak Daily | Tons | 450 | 600 | 33% |
| **Customer Trips** | | | | |
| WCW | | | | |
| All Commercial | Annual | 25,428 | 33,000 | 30% |
| | Daily | 110 | 127 | 15% |
| | MSW | 50 | 65 | 30% |
| | Recycle | 60 | 75 | 25% |
| Self-Haul/Cash | Annual | 64,559 | 84,000 | 30% |
| | Daily | 227 | 300 | 32% |
| **Organics** | | Tons/Year | Tons/Year | |
| Yard Waste | | | | |
| | County | 5,514 | 7,200 | 31% |
| | Metro* | 11,800 | N/A | |
| Wood | | | | |
| | County | 5,465 | 7,100 | 30% |
| | Metro* | 245 | | |
| Mixed Organics | | | | |
| | Source Separated | 1,416 | 1,840 | 30% |
| Food Waste – MSW | | | | |
| | Vegetative | 13% 15,173 | 22,230 | 47% |
| | Other | 8% 9,200 | 13,700 | 49% |
| | | 24,373 | 35,930 | 47% |
| | | | | |
| | Source Separated | 12,395 | 16,140 | 30% |
| **Total Organics** | MSW + SS | 36,768 | 52,070 | 42% |

*Material that originates from the Portland Metro region

**Table 4: Clark County Population Projections**

| Clark County Population Projections | | | | | |
|---|---|---|---|---|---|
| City or Area | 2010 Census | 2020 Census | % Increase | 2040 | 2020 to 2040 % Increase |
| Battle Ground | 17,571 | 20,743 | 18.05% | 29,698 | 43.2% |
| Camas | 19,355 | 26,065 | 34.67% | 37,712 | 44.7% |
| La Center | 2,800 | 3,424 | 22.29% | 5,060 | 47.8% |
| Ridgefield | 4,763 | 10,325 | 116.78% | 16,716 | 61.9% |
| Vancouver | 161,791 | 190,915 | 18.00% | 272,837 | 42.9% |
| Washougal | 14,095 | 17,039 | 20.89% | 24,140 | 41.7% |
| Woodland (part) | 0 | 84 | | 119 | 42.0% |
| Yacolt | 1,566 | 1,668 | 6.51% | 2,344 | 40.5% |
| **Incorporated Clark County:** | **221,941** | **270,263** | **21.77%** | **388,625** | **43.8%** |
| **% Incorporated:** | 52.2% | 53.7% | 2.91% | 54.0% | 0.5% |
| **Unincorporated Clark County:** | **203,422** | **233,048** | **14.56%** | **331,503** | **42.2%** |
| **% Unincorporated:** | 47.8% | 46.3% | -3.18% | 46.0% | -0.6% |
| **Clark County:** | **425,363** | **503,311** | **18.33%** | **720,128** | **43.1%** |

*Source: Washington State - Office of Financial Management, Forecasting and Research Division*

**Appendix A**

**Findings from Phase 1 RSWSS**

One recommendation was to consider developing a long-term master site plan. This plan would be prepared in conjunction with the evaluation of the infrastructural needs identified from updating the long-term Solid Waste Management Plan. Examples of this are as follows:

1. One system option may be to construct a new MRF in a central location to both collection routes and provide transportation access to regional markets.
2. If the MRF is relocated, it will free up a large building that could be repurposed for other service needs. One concept could be to provide a construction/demolition recycling facility.
3. A decision to reduce food waste and organics from being disposed in landfills as directed by the new state law, the MRF building could be repurposed to process these materials. This is a trend in other states.

The master plan can be prepared to establish how these facilities can be implemented with the caveat they may not be built immediately but can identify the space needs for such operations. By completing the master plan, it would help prevent spending good money after bad money on new facilities.

# Central Transfer and Recycling Facility Master Plan

## *Basis of Master Plan Report*

Prepared by JRMA
May 30, 2023

***Introduction***

Central Transfer and Recycling (CTR) facility is located on Washington State Route 503 in central Clark County near Brush Prairie. It serves the largest area of the County and is the area projected to have the most growth over the next 20 years.

**Figure 1: Current CTR Site Plan**


The facility resides on an irregularly shaped parcel of land and includes three main structures that make up the facility operations. The solid waste transfer station is the main structure. There is also a recycling building, an HHW building, and an administrative and operations office building. The facility was originally constructed circa the 1970s. In 1991, a new 38,000 sf transfer station was added to replace the original transfer building. MSW is loaded into containers that are shuttled 13 miles to a barge loading facility located at the Port of Vancouver on the Columbia River near West Van. Waste is then barged more than 200 miles to the Finley Buttes Regional Landfill in Boardman, Oregon. In addition to managing the area's waste, CRC operates a recycling and HHW waste drop-off center. **Figure 1** above provides an aerial photo of the site operations.

The original building was expanded and converted to the recycling and HHW building. An automatic scale system for route trucks was installed in 2012.

***Key Findings from Phase 1***

<u>Review of CTR Conditions Assessment</u>

The limited structural and site improvement condition assessment reveals that most of the assets at the site are in fair to good condition, except for the recycling building, paved areas east of the boundary retaining wall, and the infiltration portion of the stormwater system. A summary of the key points are as follows:

- The transfer station and HHW buildings (see **Figure 1**), the north boundary retaining wall, and the south boundary retaining wall are in **good** overall condition.

- The recycling building next to the HHW building is in relatively **poor** condition. It is our recommendation that a detailed structural investigation be implemented as part of the planning process when considering public ownership of the site.
- The drive aisles that course through the site are paved with asphalt concrete pavement. Some areas of the paving are in very **poor** condition and require rehabilitation. We recommend worn surface areas be repaired or replaced.
- The east boundary buffer is in **poor** condition due to the trees and tree roots impacting the pavement section and curb. The pavement section and the damaged curb should be repaired or replaced.
- The existing pump station for the sanitary sewer system is a duplex pump system with two pumps that alternate pumping discharge of the sanitary sewer effluent. According to facility staff, one of the pumps failed in September 2019 and was replaced in the fall of 2019. CRC provides routine maintenance of equipment. The pump station is in **good** condition.
- The scale house and the scale booth were not assessed since they were to be replaced in the near future (it was replaced in December 2019). The domestic water system was not assessed since it is owned and maintained by Clark County Public Utilities.

Structural and civil condition assessments were limited to those areas that are readily accessible and visible to the field staff. Concealed conditions that become exposed in the future may change our current recommendations.

Site Circulation and Unloading Stall Capacity

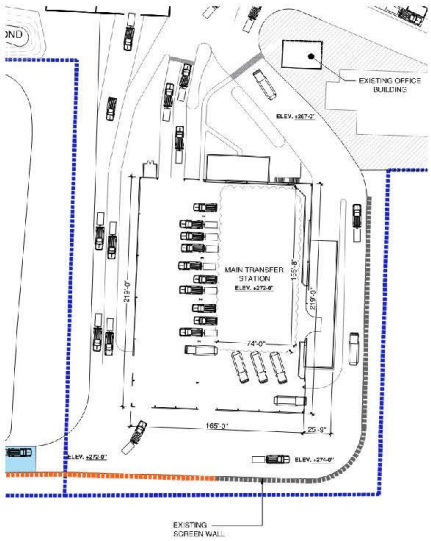
When CTR was constructed in 1991, it was not designed to accommodate the current levels of traffic, or the different activities and services currently provided.

Daily traffic at CTR averages 50 to 60 vehicles per hour. An unloading stall is expected to handle six vehicles per hour, giving 10 minutes per vehicle to maneuver into the stall, unload, and exit. Some vehicles, such as cars and pickups with less waste, will unload faster. However, vehicles with trailers and those with hydraulic tippers typically take longer. Therefore, in non-peak times, 10 to 12 stalls are sufficient for unloading.

During peak times, customer traffic can increase from 80 to as many as 100 vehicles per hour. At this volume, the facility would need to dedicate a minimum of 13 stalls for unloading during peak weekday times and 17 to 20 stalls during peak weekend times. **Figure 2** on the next page shows the tipping floor and vehicle unloading capacity (north is the left side of the figure). With the two northernmost stalls dedicated to source-separated cardboard, green waste, and clean wood (red circled area), there are only 11 stalls for unloading waste. On weekends, CTR can use the south drive aisle to route vehicles to unload. After unloading, these vehicles will exit the southeast door (blue circle) and drive to the outbound scale (green circle).

Also depicted in **Figure 3** is how transfer trucks, when loaded, exit the facility. The truck and trailer must intersect with other outbound traffic and will need to access the scale.

**Figure 2: Tipping Floor Capacity**




CRC does a good job managing traffic and ensuring vehicles can safely unload in the transfer station. Spotters are located at the entrance and on the tipping floor to guide customers to the appropriate stalls. Although the current facility does not have enough stalls to unload quickly during peak times, there is space for customers to queue onsite before entering the transfer station. However, when exiting the transfer station from the southeast door (blue circle), there is approximately 550 feet before the outbound scale, queue space for 20 to 22 vehicles. Routing vehicles in this direction can reduce the traffic queue exiting the transfer station. However, there is only one scale dedicated to processing all outbound customers and to weigh out transfer trucks.

The amount of customer traffic on weekends and during peak seasons also impacts the overall site circulation. The primary place of congestion is the outbound lanes before the scales. As shown on the site circulation map in **Figure 3**, all traffic must converge on two lanes including transfer trucks loaded with containers bound for the Tidewater loading dock.

**Figure 3: CTR Site Circulation**


Outbound traffic conditions may be improved by decreasing the time to process customers; however, the physical space for vehicles to line up to be weighed out as well as those to use the bypass lane is very limited. If the station is to make improvements to eliminate the off-site queue, it would also be desirable to consider modifications to remedy both the outbound scale capacity issues and the site circulation restrictions.

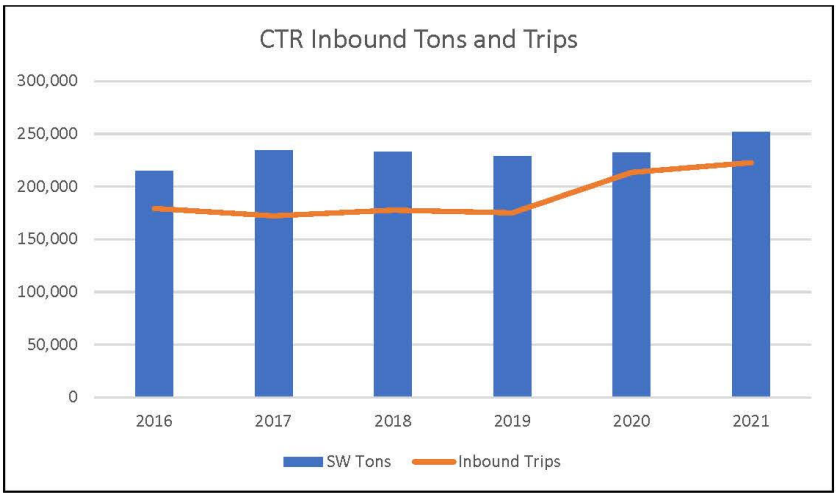
Impacts of Growth Management in CTR Service Area

Clark County has grown about 2% per year since 2010 (approximately 60,000 people from 2010 to 2019), and based on recent data from OFM, it is expected to continue at this rate for the next 20 years. The central and northern portions of the County, served by CTR, are expected to experience most of this growth, as predicted in the Growth Management Plan. The updated waste projections show that projected growth for this area could result in more than 100,000 tons of additional waste being generated per year in the next 20 years.

Growth has resulted in increased development of adjacent properties around CTR. The apartment complex on the northside of CTR has expanded, and now sits within 15 feet of the north retaining wall. Property on the west side of 112th street has been developed with new single-family houses. On the south side of the transfer station, a storage unit facility and private school were recently constructed. CRC owns eight acres located on the west side of CTR, providing a buffer between the new residential development and the transfer station. A new scale complex designed to eliminate off-site queueing problems is proposed by CRC for this property. These recent changes in the development of adjacent properties will need to be considered in deciding future changes to operations and future facility improvements.

CTR continues to experience increases in total waste volumes and the number of customers using the facility. The following is updated data that shows the increase over the past 2 years. Also, CTR is the only transfer station open on Sundays and therefore must serve the entire County. The traffic on weekends may be impacted if the County decides to expand the hours of operations at the Washougal and West Van transfer stations.

**Figure 4: CTR Inbound Tons and Trips**




Considering the increase in volume and number of self-haul customers, CTR is currently at operating capacity. This operating capacity is based on current waste quantities and hours of operation at about 900 TPD. If the waste exceeds the capacity, CRC will process the waste to ensure it is removed from the tip floor and not stored overnight. There were several observed deficiencies during the consultant team's site visits and review of data. It is important tounderstand that these deficiencies are a result of the physical conditions and limitations of the original design to handle the increase in customers and waste volume experienced over the past 30 years. CRC executes day-to-day operations to manage the current waste streams and traffic in a safe and efficient manner, given these physical constraints.

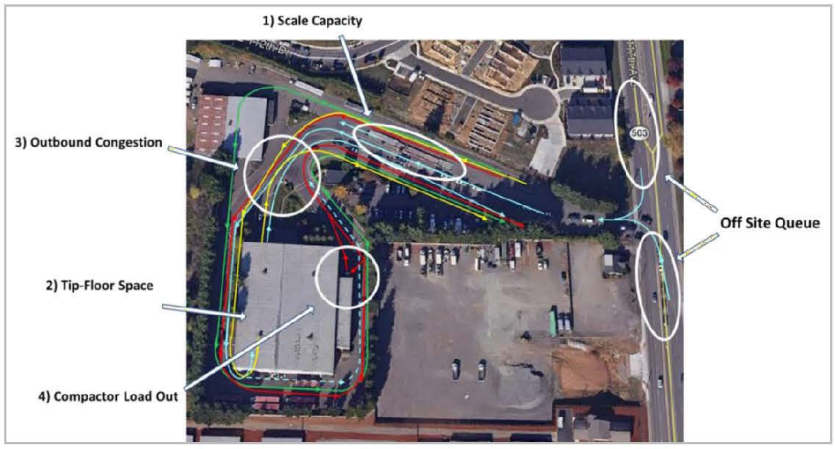
Tons received and traffic volume at West Van were updated with 2021 data. **Figure 4** illustrates that both waste received and traffic on site continue to grow at CTR.

Based on the assessment of current operations, the following site constraints and deficiencies were noted (as shown in **Figure 5**).

1. **Scale Capacity:** CRC is considering adding a second in-bound scale to increase thequeuing for in-bound traffic.
2. **Tipping Floor Space:** The current facility does not have sufficient space for vehicles to unload and limited space to handle surges in waste volumes.
3. **Congestion at Exit Lanes:** All traffic exiting the site must make a left turn into two outbound lanes. Transfer trucks are subjected to a hairpin-like turn and therefore use both lanes to access one outbound scale. The competition for the outbound scale and exiting is not a desirable condition and is exacerbated by the increase in waste quantities and increase in self-haul traffic.
4. **Compactor Load-Out Capacity:** With the current operating hours (12 per day), the compactor can only loud out about 900 TPD. CTR averages between 800 and 900 TPD. There are some days during peak periods where CTR receives between 900 and 1,100 tons. CRC reported that on occasions when waste of more than this capacity is received, they will

load this material into trailers/containers to ensure it is not stored overnight.

**Figure 5: CTR Operations Assessment**




**Summary of CTR Conditions**

The CTR was not designed to handle the current waste volume and traffic conditions. The demand for services has increased greatly, particularly in the past five years. CTR is centrally located, has been well-maintained, and is in relatively good condition. There are improvements that can be made to not only deal with the current off-site queue, but also to improve overall site circulation and enhance the material handling needs. Changes could include expanding the transfer station building to provide space for unloading and floor storage. The additional areas would provide space for unloading construction and demolition (C&D) waste for processing that could divert this material from the landfill. Added space to handle green waste and wood could also contribute to higher material recovery. The key question to address is what level of investment should be made at CTR in conjunction with other regional service needs.

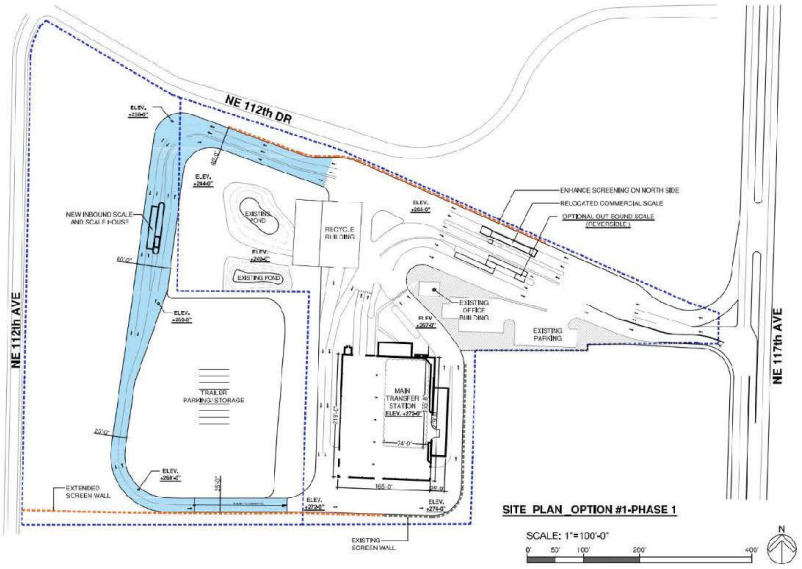
The answer to this question remains to be determined. In Phase 1 RSWSS, Chapter 5 – North Area Service Options presented what facilities are needed to serve this area. In Chapter 5, four options were developed. Drawings for those can be found in Appendix A of the RSWSS. The report identified two short-term improvements and settled on option 1.

The most immediate need identified in the system was to make improvements at CTR to address safe ingress and egress off Hwy 503. The first step was to modify the entrance to allow for two separate lanes entering the facility. This improvement is complete and there are no left turns permitted when exiting the station. Now all vehicles exiting CTR can only turn right and travel south on Hwy 503. Customers originating from north of CTR, such as Battle Ground, Ridgefield, La Center, and Yacolt must find a route to return to the north county.

The second improvement was to add lanes for inbound customers and eliminate any vehicles from queuing off-site onto the highway shown in **Figure 6**. This would allow customers to travel a much

longer entrance road to a new scale for weighing in. This was not completed and is included in the master plan improvements.

**Figure 6: Proposed Inbound Lane Addition**




To address the question of how to best serve the north and central portion of the county, the Phase 1 report evaluated the options for serving the north service area. These three options were compared to the options for making improvements at CTR. The north-central portions of the County are projected to experience the largest percentage of growth over the next 20 years. This growth has resulted in increased waste volumes and traffic at CTR and the need to make investments in facilities to manage the current conditions. However, to improve current deficiencies at CTR and manage future growth in this service area, additional investments in the system will be necessary. Updated projections show an increase in volumes to all County facilities with CTR expected to experience an increase of more than 100,000 TPY or 40% by 2040. The options for meeting the future infrastructure needs of the northcentral County were identified in the Phase 1 report.

The three distinct options identified are summarized as follows:

1. Make major improvements at CTR to address current and future service needs.
2. Make minimal improvements at CTR and site and build a new satellite transfer station to serve the northernmost portion of the County and relieve some of the customer traffic using CTR.
3. Replace CTR with a new transfer station designed to handle future growth. This alternative recognizes the need to minimize impacts to the residential properties adjacent to CTR; it is important that CTR be a good neighbor.

For each option, conceptual facility plans were developed to provide planning level construction cost estimates.

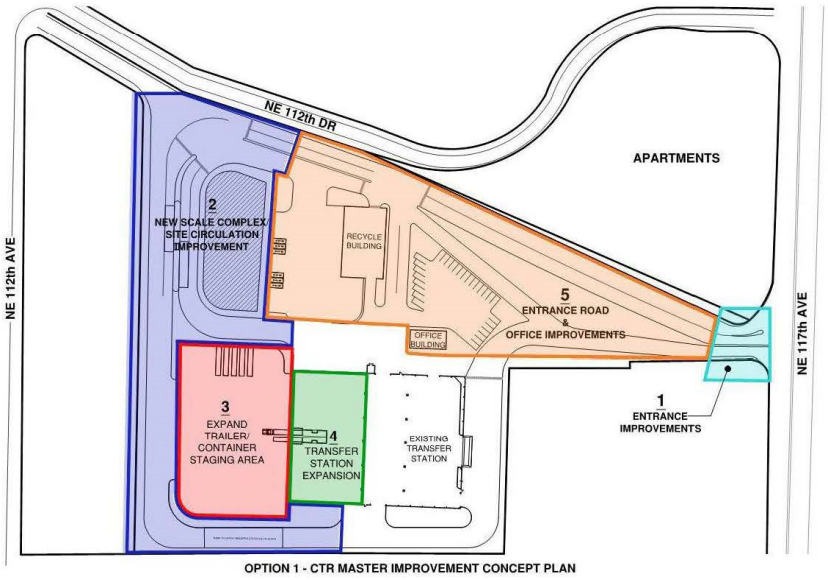
Decisions on a new transfer station and whether to move the MRF to a new location from its current location at West Van have not been made since the Phase 1 report was finalized. There has also been no decision made on the ownership of the facilities, so a summary of each developed option is as follows.

Option 1: Make Major Improvements at CTR to Address Current and Future Service Needs

This option assumes the CTR Transfer Station will make major improvements to address the current operational deficiencies and provide the infrastructure to manage waste resulting from growth in the central and northern part of the County. Improvements at CTR will be made to meet capacity needs for the next 25 plus years.

JRMA prepared several concept site plans that incorporate significant improvements to meet the needs of CTR's future conditions. These have been reviewed by the County and CRC and are the basis of the improvements listed; however, more analysis is needed to develop a final site master plan. A primary guiding principle in developing the new site plan has been the need to construct the facilities while maintaining the current operations. Therefore, the intent of the infrastructure improvements is to meet the capacity needs in a phased approach so that the facility can remain open to customers during the construction period. These improvements are captured in **Figure 7** below.

**Figure 7: Option 1 – CTR Improvements**




The option to expand CTR was used in the Phase 1 RSWSS to identify the capital investments needed to address near term deficiencies in current operations and to evaluate the best approach for expanding the facility to meet demands of the north services area. To meet this demand, the facility would require

expansion onto the adjacent property owned by CRC. As a result, the report identified several issues that need to be addressed prior to making a final decision on whether to expand CTR.

First, this adjacent property would need to obtain a land use permit to allow the planned expansion. Recognizing that the adjacent properties are now zoned for residential and have been developed will need to be considered if CTR is to expand onto adjacent property. In contrast, if a decision was to close CTR and build a new transfer station it also is subject to a siting and permitting process.

Second, the adjacent property is believed to have been part of an old landfill that closed many years ago. This raises questions as to what impacts these conditions may have in redeveloping the adjacent parcel.

Third, the only access to the facility is off Hwy 503, a major north/south transportation corridor in the County. The entrance to CTR has been improved to enhance safe ingress and egress by eliminating the left turn for outbound traffic. Also, the Washington Department of Transportation will not permit a traffic signal to be installed. Thus, the site will need to contend with the high traffic volume on a long-term basis with the current entrance. Although certain improvements included in the site plan can relieve queueing onto the public right of way, traffic on Hwy 503 will increase as the north area of the county grows.

Option 2: Make Minimal Improvements at CTR and Site/Build a New North SatelliteTransfer Station to Accept Primarily Waste from Self-Haul Customers

This option assumed minimal investments at CTR. The improvements were targeted to advance onsite conditions to handle existing traffic. It recognized that adding any more traffic with access off Hwy 503 and accepting more waste at CTR as the region grows is less desirable. However, CTR is centrally located and with minimal investments, the facility can handle current traffic more efficiently. **Figure 8** on the next page depicts the proposed improvements to the existing CTR facility to address the immediate needs. In addition to improving site circulation and eliminating offsite queueing, a small building constructed on the west side of the existing transfer station may be feasible. This new structure is considered an optional investment to address self-haul customer traffic and provide additional unloading stalls. The improvements to CTR are expected to include the following features:

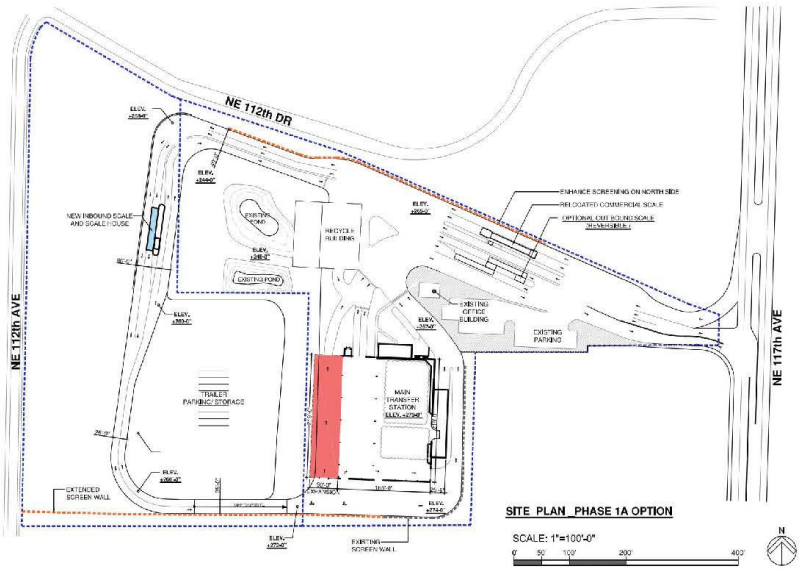
1. Modify entrance to accommodate lane separation for onsite queue and possibly construct access to the adjacent property on the west side like option 1.
2. Regrade and pave the back property to provide an area for staging trailer/containers for transport to the disposal site. An access ramp to the south side of the transfer station would be constructed.
3. Add new scales and gatehouse to handle self-haul traffic during peak hours on WCW property on CTR's west side.
4. Expansion onto the adjacent west property is predicated on the assumption that the underlying soil conditions are suitable to support new structures and that land use approval is obtained.

These are minimal improvements to mitigate near-term operating deficiencies, assuming a long-term plan of siting and building a new satellite transfer station/convenience center to serve the north area.

The expanded transfer station would serve to improve overall operations until a satellite station was sited and constructed. Under this approach once the satellite station is operational, CTR would only receive waste from commercial collection trucks. This would positively impact neighbors by reducing

traffic since the facility would not receive waste from self-haul customers. Also, impacts on neighboring properties would be greatly reduced on weekends with no self-haul traffic and limited operations.

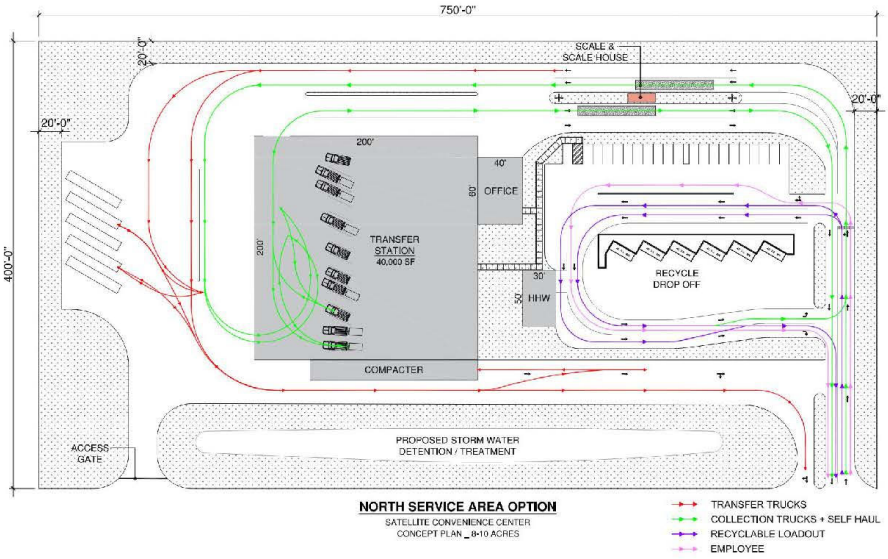
**Figure 8: CTR Improvement Option**




Option 2 also includes siting a satellite transfer station often referred to as a "convenience center" to receive waste from self-haul customers. The new convenience center would be a smaller structure but large enough to ensure capacity to handle future growth. Typically, convenience centers are open seven days per week but the days and hours for operations can vary depending on the local jurisdiction's policies and practices.

**Figure 9** on the next page shows a concept plan for a typical satellite facility. The actual size and site configuration will vary based on local conditions and determined by the desired services to be provided.

**Figure 9: Option 2 – CTR Satellite Station**




Features for a new northern area satellite transfer station may include:

1. A minimum site of six acres of commercial/industrial zoned property is located on a minor arterial road. However, it would be desirable to have seven to ten acres.
2. A new convenience center/transfer station (Estimated to be approximately 16,000 to 20,000 sf building) to handle up to 400 TPD.
3. Recycling /HHW drop-off center.
4. Scale complex with one inbound and one outbound scale and gatehouse.
5. Top load trucks from the floor and no compactor.

It would be expected to take a minimum of three years to site and permit the new facility, but this is just an estimate, and permitting a new site could be longer depending on local zoning requirements. This assumes that conducting the siting process with public involvement would take 12 to 18 months. The timeline for zoning approval would be similar (12 to 18 months) considering it would require a conditional use process. Design and construction would occur over two years meaning a new facility may take a minimum of five years before it would be operational.

Benefits of this new north area facility include:

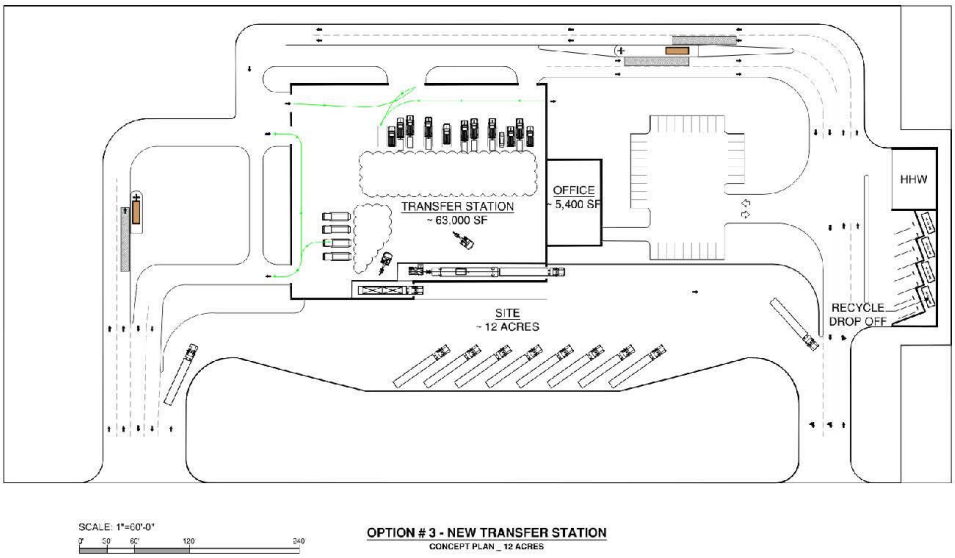
1. Improves onsite queue and circulation issues at CTR.
2. Increases scale capacity and assumes new scale house software to improve transaction times.
3. Increases space to provide needed stalls for self-haul and cash customers to unload more safely during peak conditions.
4. Provides some separation of self-haul vehicles from WCW collection trucks under peak conditions.
5. May increase needed capacity to loadout waste.
6. Provides additional floor space for flexibility in managing different waste streams.
7. Adds new facility to serve the fastest growing area of the County.
8. Eliminates self-haul customers at CTR which reduces operating hours and days, benefiting neighbors.
9. Reduce overall traffic at CTR and may reduce drive times for self-haul customers when a satellite facility is operational.

Option 3: Replace CTR with New Transfer Station at a New Location

The CTR Transfer Station was not designed to handle the traffic and quantities of waste currently received. Over the past five years, there have been many new developments in the surrounding properties. This includes new residential developments as well as a new school and church. With the expected growth, the County may decide that it may not be the best long-term site to invest in. One option is to make minimal investments in CTR to address immediate operational needs and establish a new location to serve the long term.

To provide future waste management and recycling services, a modern transfer station would be sited and constructed. Ideally, the new station would still be somewhat central to most of the population it serves and be located on commercial /industrial zoned property with access off an arterial or major collector street. It would be located to serve the current service area as well as the growing area of the North County cities. **Figure 10** below shows the proposed concept site plan for a new transfer station to replace CTR.

**Figure 10: Option 3 – New Transfer Station**




The following describes the key features of a new transfer station:

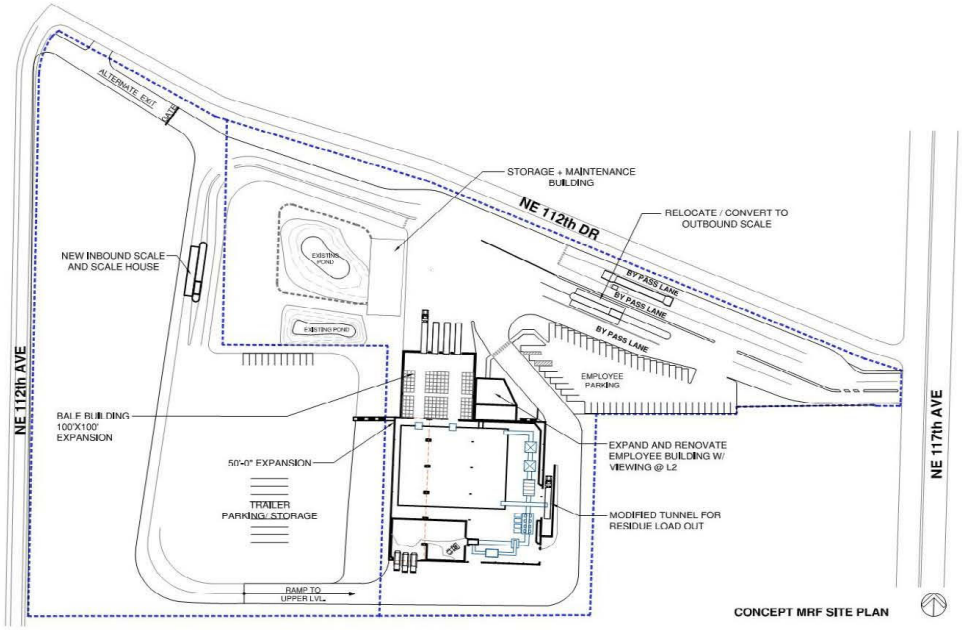
- A minimum site of 12-acres of commercial/industrial zoned property located on a minor arterial road.
- A new transfer station building (approx. 70,000 sf building) to handle up to 1,500 TPD.
- Minimum of two (2) load-out ports equipped with compactors and one top load port to be used as backup and for other materials.
- A recycling / HHW drop-off center.
- Preferably a separate or split access drive for collection trucks to separate from self-haul traffic for safety reasons.
- Separate scales for weighing collection trucks with RFID readers and the capability to weigh out vehicles.
- Parking area for staging trailers and containers.
- Office and employee break/restroom and training area.
- Possible education center for tours.

This facility would also incorporate green design features such as natural lighting, recycled-content building materials, water conservation features, renewable energy features, modern odor, and dust control systems.

MRF Option: If CTR Closed

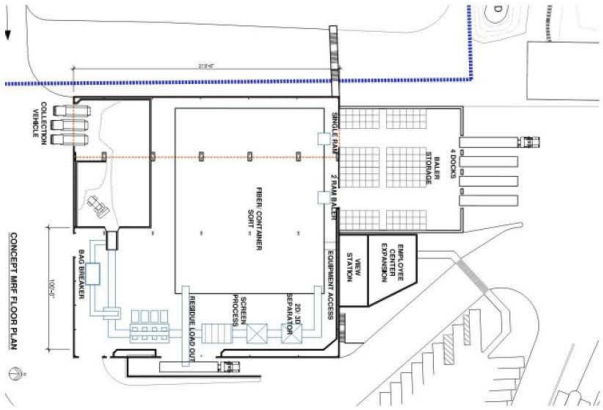
If CTR was closed to receiving MSW from both commercial collection trucks and self-haul, one option to consider would be to repurpose the facility into a MRF. Repurposing CTR would result in lower system costs since to site, permit and construct a MRF at a new location would require more capital. **Figure 11** shows a concept for converting CTR to a new MRF.

**Figure 11: Concept MRF Site Plan**




As shown on the conceptual floor plan the primary expenditure to convet CTR would be to expand the struture by adding a bale storage and shipping buildng on the north side.

**Figure 12: Convert CTR to MRF - Floor Plan**




***Basis of Master Plan Data for North Service Area***

Based on the findings from Phase 1 RSWSS and the recently passed HB 1799, the updated design data in **Table 1** and **Table 2** is recommended to be the basis of the West Van Master Plan. This Basis of Master Plan considers that new census data and waste quantities received have resutled in new projections.

**Table 1: CTR - Basis of Master Plan Data (Updated per 2020 Census)**

| Category | | Existing Transfer Station | Future (20 Years) |
|---|---|---|---|
| **Building Space** | | | |
| | | 38,000 sf - 36,136 excl. loadout | Space need defined by criteria |
| **Waste Quantities** | | | |
| Annual | Tons | 251,847 | 353,263 |
| Average | Tons/Day | 900 | 1,200 |
| Peak | Tons/Day | 1,100 | 1,400 |
| **Traffic/Unloading Capacity** | | | |
| Commercial | Ave Per Day | 100 | 130 |
| | Ave Per Hour | 25 | 30 |
| Commercial Stall | | 4 to 5 | 5 |
| Self-Haul Weekday | Peak | 600 | 780 |
| | Per Hour | 70 | 90 |
| Weekday Stalls | | 14 | 18 |

| | | | |
|---|---|---|---|
| Self-Haul Weekend | Per Hour | 100 | 130 |
| Weekend Stalls | | 20 | 26 |
| *Assumes 1 stall is 5 cars an hour | | | |
| **Operating Space** | | | |
| Available area to stack waste, handle surge, and load trailers. Excludes maneuvering and stall for unloading | | | |
| Need | | 13,000 sf | 18,000 sf (1 day storage + 10% operations) |
| Available | | 11,000 sf | |
| Average | | 900 TPD | 1,200 TPD |
| | | 30 ton payload | |
| | | 30 trailer loads | |
| | | 25 minutes 12.5 hours* | 16 hours @ existing |
| Peak | | 1,100 TPD | 1,400 TPD |
| | | 15 hours* | 20 hours @ existing |
| *Assumes no disruptions | | | |
| **Trailer Parking** | | | |
| | | Space for 4 | Assume 8 trailers for staging |
| | | Minimum 6,000 sf | 12,000 sf |
| **Scale Capacity/Transactions** | | | |
| Inbound - 1 - SH scale | | 80 vehicle/hour | 120 vehicle/hour |
| Outbound - 1 SH scale shared with transfer trailers | | 80 vehicle/hour | 120 vehicle/hour |
| *Note both inbound and outbound scales at 45 seconds/transaction | | | |

Table 2: Clark County Population Projections

| Clark County Population Projections | | | | | |
|---|---|---|---|---|---|
| City or Area | 2010 Census | 2020 Census | % Increase | 2040 | 2020 to 2040 % Increase |
| Battle Ground | 17,571 | 20,743 | 18.05% | 29,698 | 43.2% |
| Camas | 19,355 | 26,065 | 34.67% | 37,712 | 44.7% |
| La Center | 2,800 | 3,424 | 22.29% | 5,060 | 47.8% |
| Ridgefield | 4,763 | 10,325 | 116.78% | 16,716 | 61.9% |
| Vancouver | 161,791 | 190,915 | 18.00% | 272,837 | 42.9% |
| Washougal | 14,095 | 17,039 | 20.89% | 24,140 | 41.7% |
| Woodland (part) | 0 | 84 | | 119 | 42.0% |
| Yacolt | 1,566 | 1,668 | 6.51% | 2,344 | 40.5% |
| **Incorporated Clark County:** | **221,941** | **270,263** | **21.77%** | **388,625** | **43.8%** |
| **% Incorporated:** | 52.2% | 53.7% | 2.91% | 54.0% | 0.5% |
| **Unincorporated Clark County:** | **203,422** | **233,048** | **14.56%** | **331,503** | **42.2%** |
| **% Unincorporated:** | 47.8% | 46.3% | -3.18% | 46.0% | -0.6% |
| **Clark County:** | **425,363** | **503,311** | **18.33%** | **720,128** | **43.1%** |

*Source: Washington State - Office of Financial Management, Forecasting and Research Division*

***Basis of Master Plan Additional Considerations***

Prior to making any large investments at CTR a decision on which option is best for serving the north/central county should be implemented. However, each of the options will require several years to site and permit. Even after the permits are secured final design and construction will require a minimum of two to three years. Given this timeline improvements at CTR should be to eliminate potential for offsite queueing onto Hwy 503. Also, the option to expand the existing structure and provide added tip floor space may be beneficial in both the short run and for the long term if Option 2 is selected.

Organics Management

CTR processed approximatly 1,500 tons of yard debris in 2021 and no source seperated commercial food waste. This material is reloaded and sent to Dirt Hugger, a compose facility in Dallesport WA. With the passed HB 1799, the design for CTR will include the continued collection of yard debris and provide options for expanding reload capacity in the future. The site as currently used is not supportive of any preprocessing options for organic material.

Pending an organics feasibility study, it is recommended that space be allocated for the collection of both yard debris and source seperated commercial food waste for reloading in any proposed facility. In the event of the siting of a full service transfer statation, proper space should be allocated for preprocessing equipment to provide flexibility.

North Service Area Options

Investments in the future needs of CTR will need to be made depending on the negoiations with CRC and the County and consideration of options relating to the North Service Area Options. The options for consideration have been described in the Summary of CTR section of this report. The three options are:

- Option 1: Make Major Improvements at CTR to Address Current and Future Service Needs
- Option 2: Make Minimal Improvements at CTR and Site/Build a New North SatelliteTransfer Station to Accept Primarily Waste from Self-Haul Customers
- Option 3: Replace CTR with New Transfer Station at a New Location

Option one has some issues that would make it an unlikely choice. At the back of the property is an old inert landfill and stability for building is questionable on this part of the site. There is also a different zoning for the back lot of CTR meaning a conditional use review would be needed to develop it and the neighborhood characteristics have changed since the site was first developed making any expansion much more difficult. It is recommended that the County conduct further evaluation of these options once negotiations are complete. A decision on the MRF could also influence preference for one option over another.

# Washougal Transfer Station Master Plan

## *Basis of Master Plan Report*

Prepared by JRMA
January 10, 2023

***Introduction***

This document reviews the findings from the 2021 Phase 1 Regional Solid Waste System Study (RSWSS) as well as incorporates updates in data and changes since publication. This document will highlight information needed for consideration of what improvements/modifications should be prioritized and used to prepare a master plan for the Washougal Transfer Station (Washougal). Preparing a master plan for Washougal was a key recommendation from the RSWSS. The master plan will identify the infrastructure required for managing solid waste and recycling services over the next 20 years.

***Background and Existing Conditions***

Washougal began operations in 2009 and is operated by Columbia Resource Company (CRC). The facility is located on a 4.6-acre site in the Port of Washougal. Customers enter from Grant Street to a scale house complex that includes one inbound scale and one outbound scale. Each customer must be weighed, and fees are assessed based on total waste disposed. The facility includes an 80-by-60-foot transfer station building (4,800 sf) for customers to unload waste. Transfer trucks enter the east side through a depressed tunnel for loading trailers that are transported to the Wasco Landfill in The Dalles, Oregon. The station operates as a lift-and-load, meaning the bottom of the tunnel is only eight feet (ft) below the tipping floor. A front loader is used to lift waste about nine ft to load trailers. This operation does reduce the time to load trailers, but waste can spill off the sides and onto the tunnel floor, which requires regular cleaning.

The transfer station has three 22-foot-wide access doors located on the west side where collection trucks unload. This design allows for up to six (6) vehicles to unload at one time. The layout of the facility is shown in **Figure 1**.

**Figure 1: Current Washougal Site Plan**


The facility is open six days per week (Monday-Saturday) for commercial collection trucks from 7 a.m. to 5 p.m. The transfer station is open to the public and self-haul traffic on Wednesdays and Fridays from 7 a.m. to 5 p.m., and Saturday from 8 a.m. to 4 p.m. On these days commercial collection trucks can use a 22-foot roll-up door on the south side to unload. This allows self-haul customers to use the west side doors to unload on these days.

The facility also provides a drop-off center where customers can bring commingled and source-separated materials to be recycled. The drop-off center is open to the public Monday through Friday from 7 a.m. to 5 p.m. and Saturday from 8 a.m. to 4 p.m. Customers can drop off household hazardous waste (HHW) every third Saturday of the month from 8 a.m. to 4 p.m.

In Phase 1 RSWSS an assessment of the conditions of Washougal was conducted. Some minor repairs are required but primary structures and site appear in good condition.

***Washougal Transfer Station Waste Quantities***

Washougal received 38,638 tons in 2021 representing about 10% of the County's waste. **Tables 1 and 2** summarize solid waste tonnage and customer (vehicle) trips made annually to Washougal over the past six years. Total waste received increased by almost 20% over the past two years while the number of trips increased by nearly 32%. This has occurred even though the station is open to receive waste from self-haul customers only three days per week (Wednesday, Friday, and Saturday).

**Table 1: Washougal Annual Solid Waste Tonnage by Customer Type**

| Solid Waste Tons | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 5-Year Ave. (2017-2021) | % Ave. of Total |
|---|---|---|---|---|---|---|---|---|
| Cash | 3,318 | 4,263 | 4,446 | 5,177 | 6,700 | 6,598 | **5,437** | **16%** |
| Commercial | 220 | 421 | 397 | 836 | 335 | 442 | **486** | **1%** |
| Route Trucks | 14,539 | 14,914 | 15,090 | 15,104 | 16,776 | 18,579 | **16,093** | **47%** |
| WCW Drop Box | 13,295 | 13,816 | 11,987 | 11,209 | 12,756 | 13,019 | **12,557** | **36%** |
| **Total Tons** | **31,372** | **33,414** | **31,919** | **32,326** | **36,566** | **38,638** | **34,573** | |

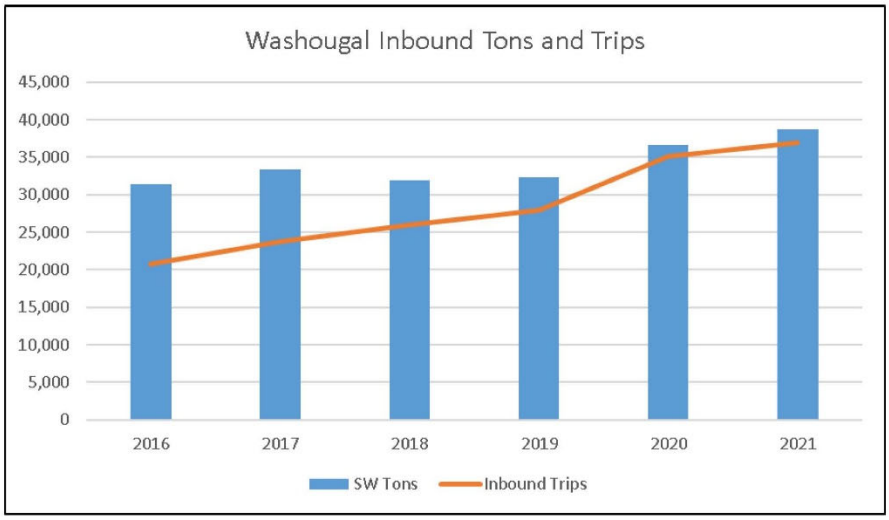
**Table 2: Washougal Annual Customer (Vehicle) Trips**

| Inbound Trips | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 5-Year Ave. (2017-2021) | % Ave. of Total |
|---|---|---|---|---|---|---|---|---|
| Cash | 14,923 | 17,542 | 19,678 | 21,703 | 28,411 | 29,669 | **23,401** | **78%** |
| Commercial | 328 | 416 | 364 | 512 | 291 | 582 | **433** | **1%** |
| Route Trucks | 1,701 | 1,769 | 1,976 | 1,931 | 2,163 | 2,305 | **2,029** | **7%** |
| WCW Drop Box | 3,841 | 4,049 | 3,938 | 3,855 | 4,202 | 4,333 | **4,075** | **14%** |
| **Total Trips** | **20,793** | **23,776** | **25,956** | **28,001** | **35,067** | **36,889** | **29,938** | |

Based on the 2021 data, Washougal receives on average about 125 tons per day (TPD) assuming a six-day week operation and 150 TPD if a five-day operational week is assumed. The five-day average should be considered as most of the waste is received during this period. Most customers on Saturday are self-haul vehicles that have small loads.

As shown in **Figure 2** both the trips and total tons received have increased steadily over the past three years.

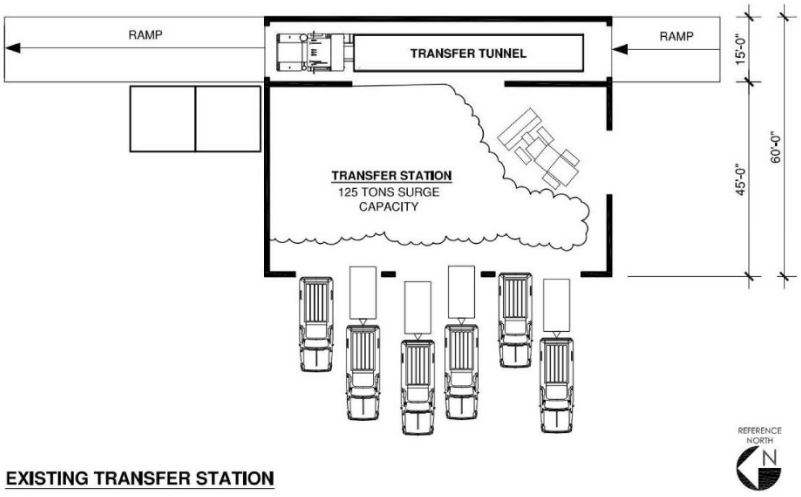
**Figure 2: Washougal Inbound Tons and Trips 2016-2021**




***Existing Tip Floor Operation***

The existing tip floor operation shown in **Figure 3** consists of an area that is approximately 40 ft x 60 ft or 2,400 sf. Accounting for the area to operate equipment to load transfer trailers leaves about 2,000 sf of surge capacity assuming no vehicles are unloading in the building. If the station receives 125 TPD the surge capacity requires about 1,700 sf to temporarily store waste. If the station receives 150 TPD the needed surge capacity increases to 2,000 sf based on the current waste volume received the facility is basically at full capacity.

**Figure 3: Washougal Existing Tipping Floor**




Likewise, there are only six stalls available to unload the self-haul customers on the west side of the station. Based on 2021 data, Washougal receives about 200 self-haul customers per day over the three days of operation. This level of traffic suggests that six stalls is generally adequate for unloading this number of customers without causing major onsite queue issues. However, there could be certain times of the year where there are longer wait times to unload. During this period, the commercial trucks primarily unload on the south side of the station. And, although the data suggest that a single stall is nominally adequate for unloading commercial collection trucks it is more desirable to have at least two and preferably three stalls during peak hours.

In the RSWSS Phase 1 Report (completed September 2020) it was noted that the Washougal will need to be expanded soon. However, the County is currently considering the option to expand the number of days Washougal is open to receive self-haul customers. It is expected to help relieve some of the traffic issues at Central Transfer and Recycling Center (CTR). This decision may also impact the timeframe for expanding the existing Washougal as the tip floor does not have capacity to handle more waste generated by growth or by decisions to expand the operating hours for self-haul customers.

Potential site improvements identified in the Phase 1 Report are discussed further in the Transfer Station Condition Assessment section of this document.

***Waste Projections for Washougal***

The population of the cities of Camas and Washougal is projected to increase from 43,104 (2020 Census) to 61,852, an increase of almost 19,000 people, by 2040. The amount of growth in the unincorporated areas in the eastern part of the County is more difficult to project. Based on assumptions made in the waste projections, it is estimated that 11,000 more people could live in the unincorporated portions of eastern Clark County. In total, 28,000 additional people are projected to be served by the Washougal Transfer Station.

**Figure 4: Map of County with Annexation**

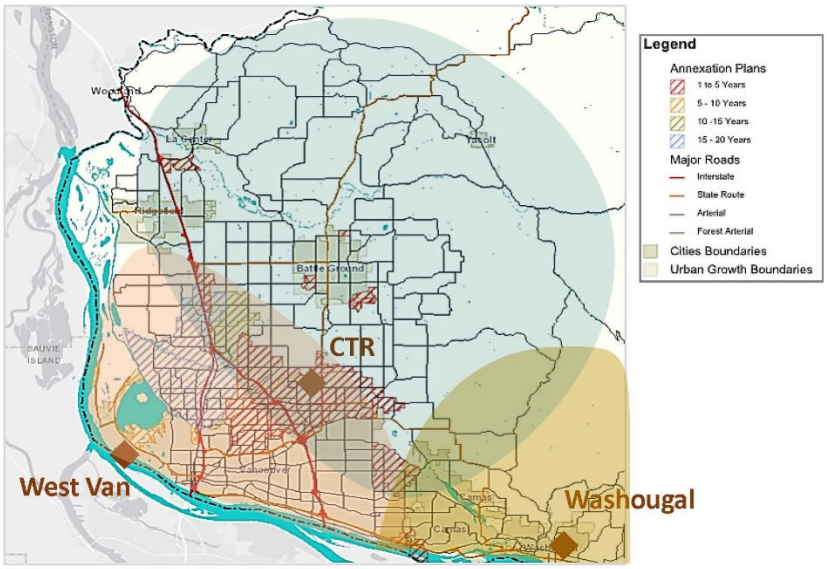



**Table 3** below shows that the County will generate an additional 106,000 tons per year (TPY) by 2040. Under both assumptions, waste generated in the Washougal service area increases 21.2%.

**Table 3: Estimated Service Area Waste Projections**

| Transfer Station Service Area | Assuming 50% UGB Growth in Central Area | | | Assuming 70% UGB Growth in Central Area | | |
|---|---|---|---|---|---|---|
| | Population | % Change of Waste | Additional Waste (TPY) | Population | % Change of Waste | Additional Waste (TPY) |
| **Service Areas** | | | | | | |
| *Growth in City of Vancouver in North/Central County* | 40,961 | | 41,780 | 57,706 | | 58,860 |
| *Growth in Unincorporated North/Central County* | 49,227 | | 50,212 | 49,227 | | 50,212 |
| *Growth in North Cities* | 26,968 | | 27,507 | 26,968 | | 27,507 |
| **CTR Service Area:** | **117,156** | **54%** | **88,734** | **133,901** | **62%** | **101,416** |
| *Growth in City of Vancouver (25% of City & County)* | 20,840 | | 21,257 | 20,480 | | 20,890 |
| *Growth in unincorporated East County – Assume 20%* | 19,112 | | 19,494 | 19,112 | | 19,494 |
| *Growth in East Cities* | 18,748 | | 19,123 | 18,748 | | 19,123 |
| **Washougal Service Area:** | **58,700** | **27%** | **44,459** | **58,340** | **27%** | **44,187** |
| **West Van Service Area:** | **40,961** | **19%** | **31,024** | **24,576** | **11%** | **18,614** |
| ***Total:*** | **216,817** | **100.0%** | **164,217** | **216,817** | **100%** | **164,217** |

With this growth, the increase in waste will be about 23,000 TPY over the next 15 to 20 years. When added to the current waste volume of 32,000 TPY, the projected total waste is estimated to be about 55,000 TPY. This estimate suggests the amount of waste received at the Washougal will increase to about 1,060 tons per week. With only 7% delivered on Saturdays, the weekday volume could be between 970 to 1,000 tons. Although weekday volumes could average 200 TPD, if Wednesdays remain open to self-haul, the amount of waste received on that day could be as much as 250 tons.

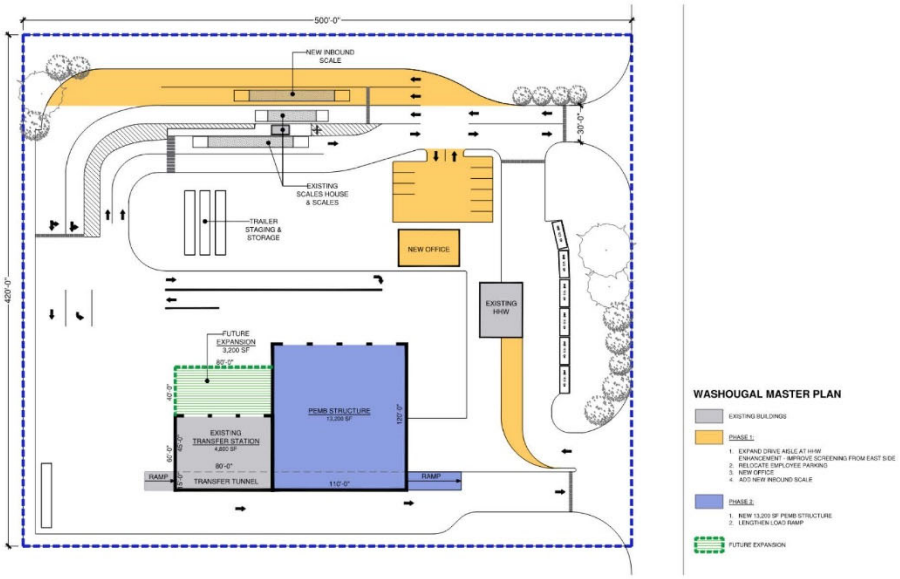
***Transfer Station Conditions Assessment***

Washougal is currently operating at its capacity but with no critical operating deficiencies. The County may consider opening the station for self-haul customers for additional days of the week. Assuming this would result mainly in distributing the current customers over a longer period, not increasing overall transactions, this may resolve any near- term needs to add more stalls. This is similar to what occurred when the CRC opened the station to self-haul customers on Fridays in 2018.

The only other minor improvement to consider would be to add a push wall to stack waste along the trailer tunnel. This could provide additional stacking for waste prior to loading and reduce spillage when loading trailers.

To address the overall needs of the facility to meet the needs of the service area, there are several improvements that should be planned to provide more unloading stalls and to add tipping floor space. This site map in **Figure 5** on the next page shows seven improvements to be included in the Capital Improvements Plan for the Washougal.

**Figure 5: Site Map Showing Improvements**




1. A short-term improvement mentioned by the operator was to expand the access lane to the HHW facility. This is a minor investment to improve traffic flow and safety and could be completed in the near future.
2. Add screening on the east side of the HHW building to reduce exposure to the elements.
3. Add a steel backsplash and chute along the east side of the building in the load-out tunnel. This backsplash will protect the siding from damage caused from loading trailers. It should also reduce possible spillage of waste from the top-load operation. Also, consider adding a short push wall on the tip floor side to increase surge capacity.
4. Expand the transfer station building with a 10,000-sf addition and pave the yard to increase capacity including expanding below grade loading tunnel. The new building can include a lean-to on the north side to provide storage of special waste.
5. Expand the entrance road to increase the capacity of the scale complex and reduce potential of traffic backing onto Grant Street.
6. Build a new office and parking, free up space for trailer storage and other storage.
7. Consider future expansion at the existing transfer station's entrance.

The 2020 Phase 1 report expected growth in the service area to increase waste volumes at the facility by as much as 21% in the next 20 years, and that these improvements could be scheduled over the next three to six years, however three years has passed since that report and these recommendations should be given greater priority.

***Basis of Master Plan Data***

Based on the findings from Phase 1 RSWSS and the recently passed HB 1799, the design data in the **Table 4 & 5** is recommended to be the basis of the West Van Master Plan. This basis of design considers that new census data and waste quantities received have resutled in new projections.

**Table 4: Washougal - Basis of Master Plan Data**

| Category | | Existing (2021) | 2040 Projections | % Change |
|---|---|---|---|---|
| **Waste Quantities (MSW)** | | | | |
| Annual | Tons | 38,638 | 83,097 | 115% |
| Average | Tons/Day | 125 | 290 | 132% |
| Peak | Tons/Day | 150 | 350 | 133% |
| **Customer Tons** | | | | |
| WCW | | | | |
| All Commercial | Annual Tons | 32,040 | 68,000 | 112% |
| | Ave Daily | 120 | 193 | |
| Self-Haul /Cash | Annual Tons | 6,300 | 15,000 | 138% |
| | Weekly Tons (3 day) | 121 | 288 | 138% |
| **Trips** | | | | |
| All Commercial | Annual | 7,220 | 15,000 | 108% |
| | Daily (5 day) | 28 | 60 | 114% |
| Self-Haul/Cash | Annual | 29,669 | 66,000 | 123% |
| | Ave Daily (3 day) | 190 | 210 (6 day) | 11% |

**Notes**
#1 Source-Washington State – OMB

**Table 5: Clark County Population Projections**

| Clark County Population Projections | | | | | |
|---|---|---|---|---|---|
| City or Area | 2010 Census | 2020 Census | % Increase | 2040 | 2020 to 2040 % Increase |
| Battle Ground | 17,571 | 20,743 | 18.05% | 29,698 | 43.2% |
| Camas | 19,355 | 26,065 | 34.67% | 37,712 | 44.7% |
| La Center | 2,800 | 3,424 | 22.29% | 5,060 | 47.8% |
| Ridgefield | 4,763 | 10,325 | 116.78% | 16,716 | 61.9% |
| Vancouver | 161,791 | 190,915 | 18.00% | 272,837 | 42.9% |
| Washougal | 14,095 | 17,039 | 20.89% | 24,140 | 41.7% |
| Woodland (part) | 0 | 84 | | 119 | 42.0% |
| Yacolt | 1,566 | 1,668 | 6.51% | 2,344 | 40.5% |
| **Incorporated Clark County:** | **221,941** | **270,263** | **21.77%** | **388,625** | **43.8%** |
| **% Incorporated:** | 52.2% | 53.7% | 2.91% | 54.0% | 0.5% |
| **Unincorporated Clark County:** | **203,422** | **233,048** | **14.56%** | **331,503** | **42.2%** |
| **% Unincorporated:** | 47.8% | 46.3% | -3.18% | 46.0% | -0.6% |
| **Clark County:** | **425,363** | **503,311** | **18.33%** | **720,128** | **43.1%** |

*Source: Washington State - Office of Financial Management, Forecasting and Research Division*

# Appendix C: CIP Spreadsheet

## BASELINE CIP - RECOMMENDED PHASE 1 PROJECTS

**Transfer Station 20 Year - Capital Improvements Program**

JRMA 6/29/2023

**THIS TABLE SHOULD BE USED FOR FINANCIAL PLANNING PURPOSES ONLY.**

**This is not a construction cost estimate.**

3.5%

| | Description | 2024 Cost Estimate | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTR - Phase 1 and 1A Improvements | | | | | | | | | | | | | | | | | | | | | | |
| Phase 1 | Provide onsite queue capacity. Access road on adjacent parcel. Ramp to south entrance to transfer station. New scale with bypass lanes. | $3,500,000 | $800,000 | $2,700,000 | | | | | | | | | | | | | | | | | | |
| Phase 1A | Option to expand existing transfer station on west side of existing building. The 11,000 sf expansion would be on existing property. | $3,000,000 | | | $200,000 | $2,800,000 | | | | | | | | | | | | | | | | |
| Total CTR Improvements (2024$) | | $6,500,000 | $800,000 | $2,700,000 | $200,000 | $2,800,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Annual Budget (Cost in Budget Year) | | | $800,000 | $2,794,500 | $214,245 | $3,104,410 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Accumulated Budget | | $6,913,155 | $800,000 | $3,594,500 | $3,808,745 | $6,913,155 | $6,913,155 | $6,913,155 | $6,913,155 | $6,913,155 | $6,913,155 | $6,913,155 | $6,913,155 | $6,913,155 | $6,913,155 | $6,913,155 | $6,913,155 | $6,913,155 | $6,913,155 | $6,913,155 | $6,913,155 | $6,913,155 |
| West Van Transfer Station Improvements | | | | | | | | | | | | | | | | | | | | | | |
| Phase 1 Site Improvements | | | | | | | | | | | | | | | | | | | | | | |
| Access Improvements | | $1,400,000 | | | $400,000 | $1,000,000 | | | | | | | | | | | | | | | | |
| Phase 2 - Utilities/Site Work | Water line extension : Retaining structure for top load | $2,000,000 | | | | $300,000 | $1,700,000 | | | | | | | | | | | | | | | |
| Phase 2B | Expansion for organics and top load | $6,700,000 | | | | | $1,000,000 | $4,000,000 | $1,700,000 | | | | | | | | | | | | | |
| Phase 3 - New Office Center | Relocate office and new employee parking | $2,200,000 | | | | | | | | $1,100,000 | $1,000,000 | | | | | | | | | | | |
| Phase 4 - New Recycle/HHW Center | New entrance and HHW/recycle drop off center | $3,000,000 | | | | | | | | $1,500,000 | $1,500,000 | | | | | | | | | | | |
| Total West Van Improvements (2024 $) | | $15,300,000 | $0 | $0 | $400,000 | $1,300,000 | $2,700,000 | $4,000,000 | $1,700,000 | $2,600,000 | $2,500,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Annual Budget (Cost in Budget Year) | | | $0 | $0 | $428,490 | $1,441,333 | $3,098,312 | $4,750,745 | $2,089,734 | $3,307,926 | $3,292,023 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Accumulated Budget | | $18,408,563 | $0 | $0 | $428,490 | $1,869,823 | $4,968,135 | $9,718,881 | $11,808,615 | $15,116,541 | $18,408,563 | $18,408,563 | $18,408,563 | $18,408,563 | $18,408,563 | $18,408,563 | $18,408,563 | $18,408,563 | $18,408,563 | $18,408,563 | $18,408,563 | $18,408,563 |
| Washougal Improvements | | | | | | | | | | | | | | | | | | | | | | |
| Transfer Station Improvements | | | | | | | | | | | | | | | | | | | | | | |
| Site Improvements | | $600,000 | $200,000 | $400,000 | | | | | | | | | | | | | | | | | | |
| Building Expansion | | $4,100,000 | | $2,000,000 | $2,100,000 | | | | | | | | | | | | | | | | | |
| Total Washougal Improvements (2024 $) | | $4,700,000 | $200,000 | $2,400,000 | $2,100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Actual Budget (Cost in Budget Year) | | | $200,000 | $2,484,000 | $2,249,573 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Accumulated Budget | | $4,933,573 | $200,000 | $2,684,000 | $4,933,573 | $4,933,573 | $4,933,573 | $4,933,573 | $4,933,573 | $4,933,573 | $4,933,573 | $4,933,573 | $4,933,573 | $4,933,573 | $4,933,573 | $4,933,573 | $4,933,573 | $4,933,573 | $4,933,573 | $4,933,573 | $4,933,573 | $4,933,573 |
| Total Improvements (2024 $) | | $26,500,000 | $1,000,000 | $5,100,000 | $2,700,000 | $4,100,000 | $2,700,000 | $4,000,000 | $1,700,000 | $2,600,000 | $2,500,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| CIP - Revenue Requirements in Budget Year | | | $1,000,000 | $5,278,500 | $2,892,308 | $4,545,743 | $3,098,312 | $4,750,745 | $2,089,734 | $3,307,926 | $3,292,023 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Total Accumulated Budget | | $30,255,291 | $1,000,000 | $6,278,500 | $9,170,808 | $13,716,551 | $16,814,863 | $21,565,608 | $23,655,342 | $26,963,268 | $30,255,291 | $30,255,291 | $30,255,291 | $30,255,291 | $30,255,291 | $30,255,291 | $30,255,291 | $30,255,291 | $30,255,291 | $30,255,291 | $30,255,291 | $30,255,291 |

Phase 2 - Facilities Plan - Key Assumptions (2023)

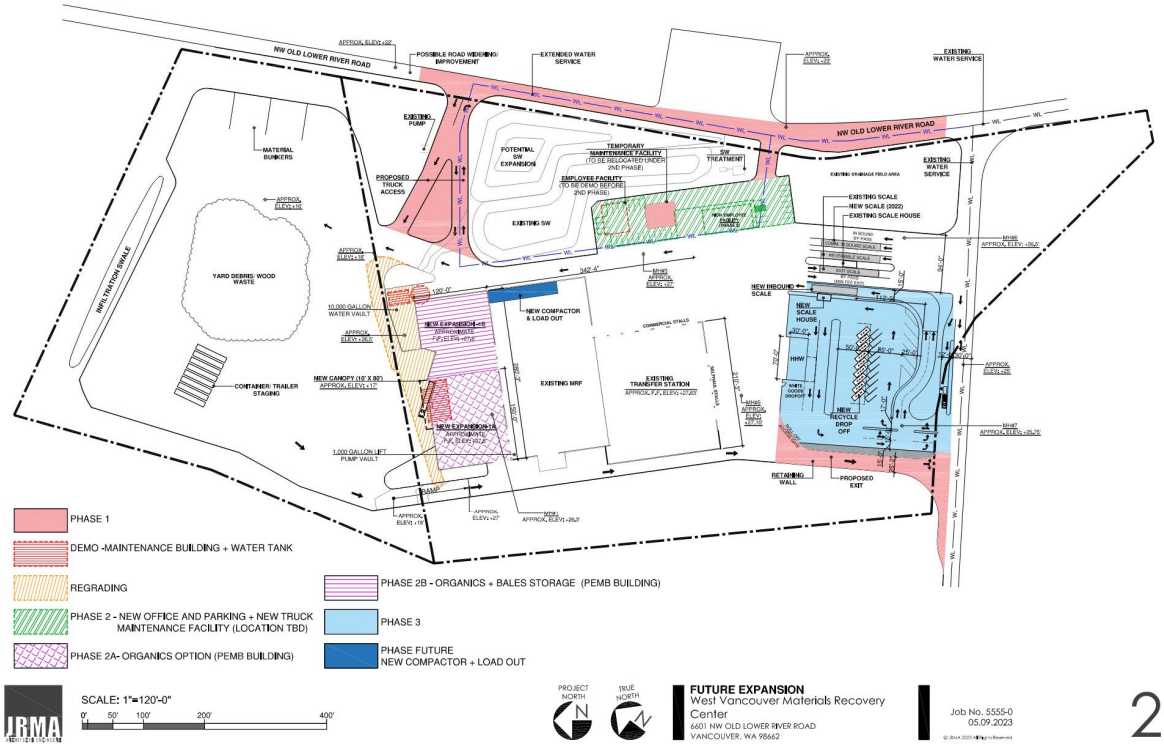
CTR Phase 1
1. Complete site evaluation and design in 2024.
2. Complete permitting and begin construction by end of 2024.
3. Complete Construction of Phase 1A in 2027 if County decides not to expand CTR onto adjacent parcel.
4. Assumes County decides to site and build satellite Transfer Station and dedicate CTR to commercial only.
5. If by 2026 County sites new transfer station phase 1A would not be constructed.

West Van
1. West Van start date has been set at 2026 due to staff capacity concerns however every attempt to begin work in 2024 should be made.
2. Phase 1 and 2 should proceed to permitting and design in 2026.
3. If by end of 2024 the MRF is to remain for extended period (3-5 years); then design and construction should proceed with Option 2A or 2B.
4. CIP assumes building Option 2B - full expansion of MRF building to manage organics and increase bale storage; however if the decision is to build only 2A, the budget can redeuced by $3M.
5. All CIP improvements to be in place by 2030.

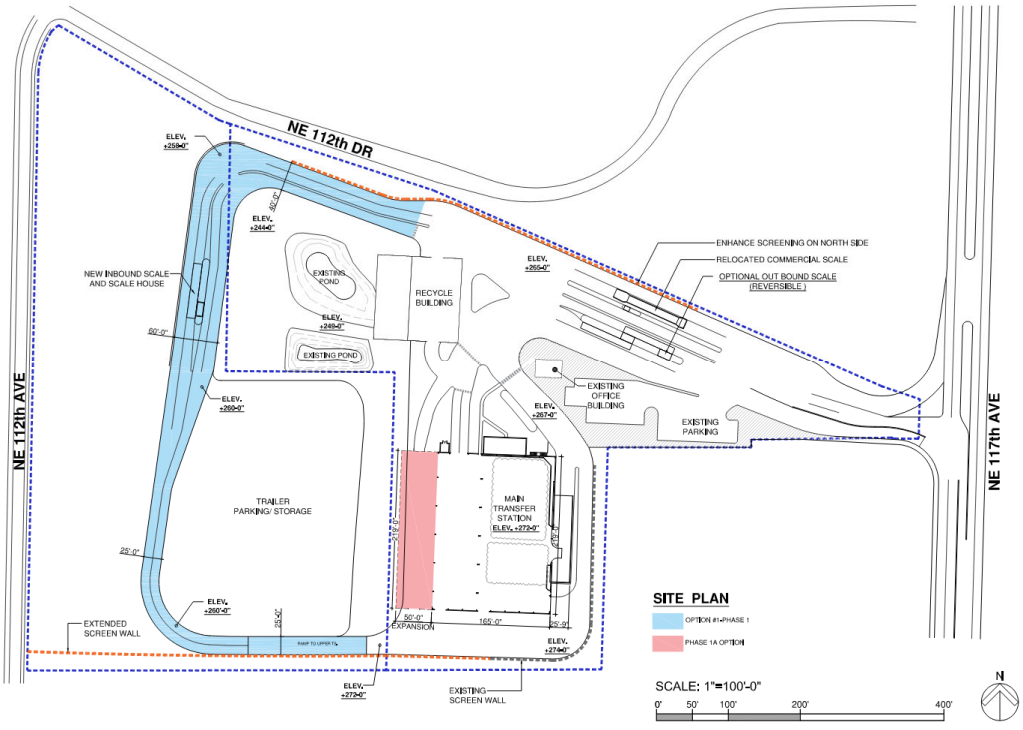
Washougal
1. Planning and design of Washougal improvements should proceed in 2023.
2. Site plan assumes new office complex and new location.
3. If the final plan is revised to relocate existing office the budget is expected to be reduced by about $600,000.

# Appendix D: Drawings

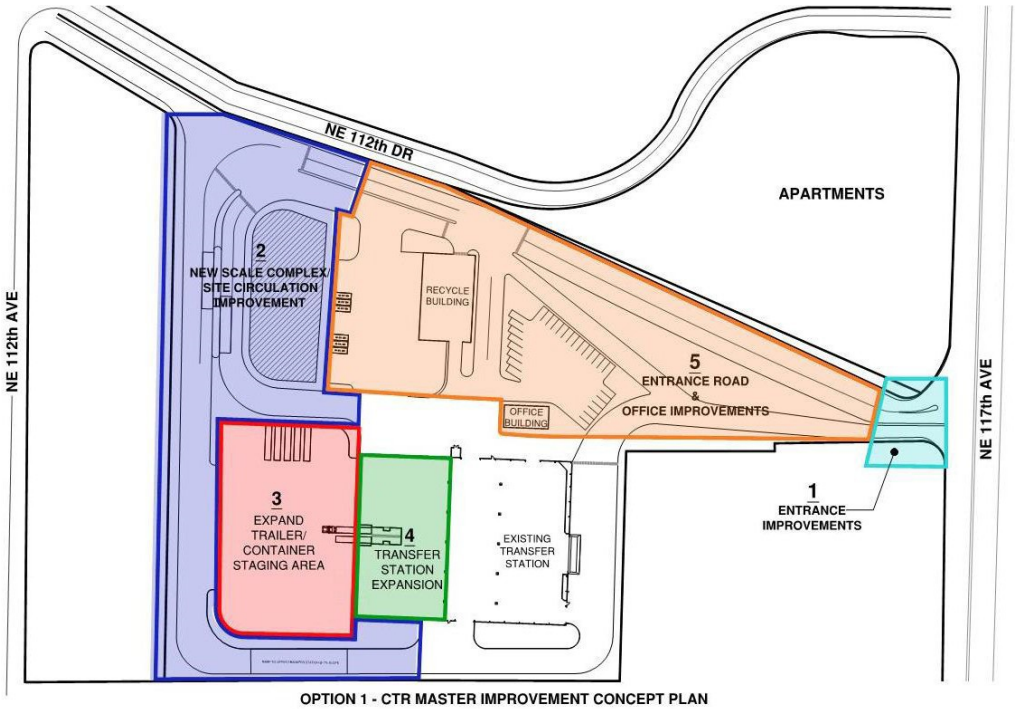
## Figure 1: West Van Site Plan




## Figure 2: CTR Improvement Option

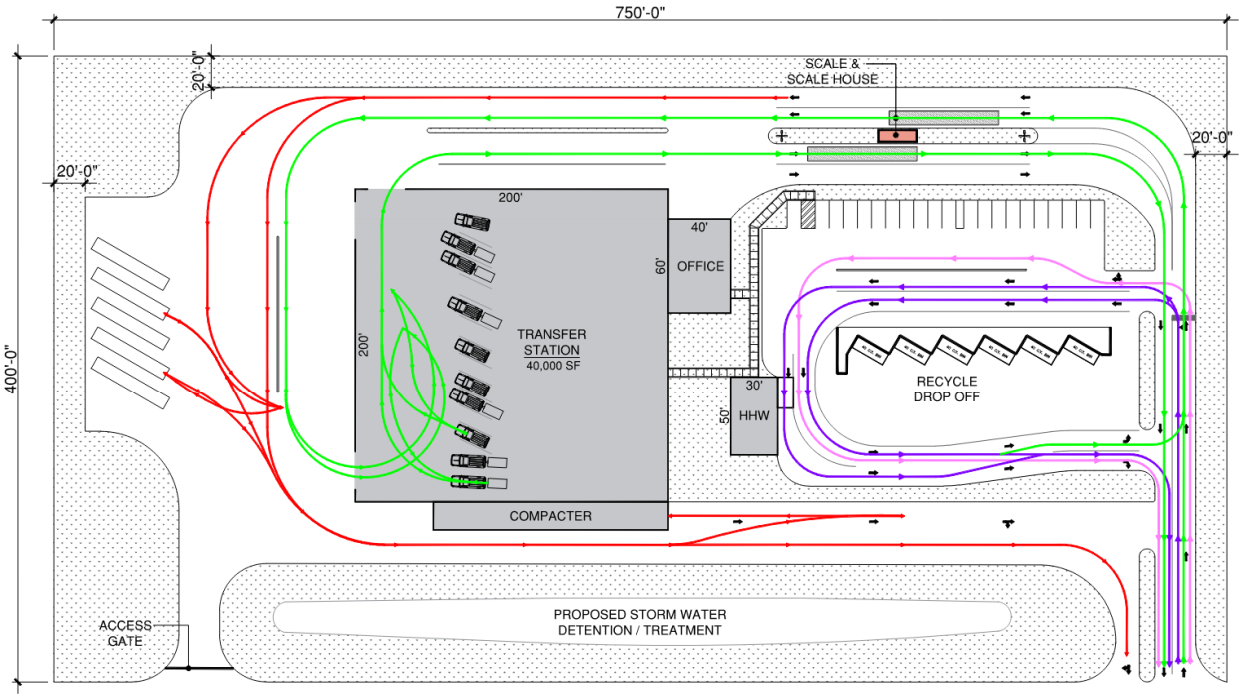


## Figure 3: Option 1 – CTR Improvements




OPTION 1 - CTR MASTER IMPROVEMENT CONCEPT PLAN

## Figure 4: Option 2 – CTR Satellite Station




**OPTION #2 NORTH SERVICE AREA OPTION**

SATELLITE CONVENIENCE CENTER
CONCEPT PLAN _ 8-10 ACRES

**Figure 5: Option 3 – New CTR Transfer Station**

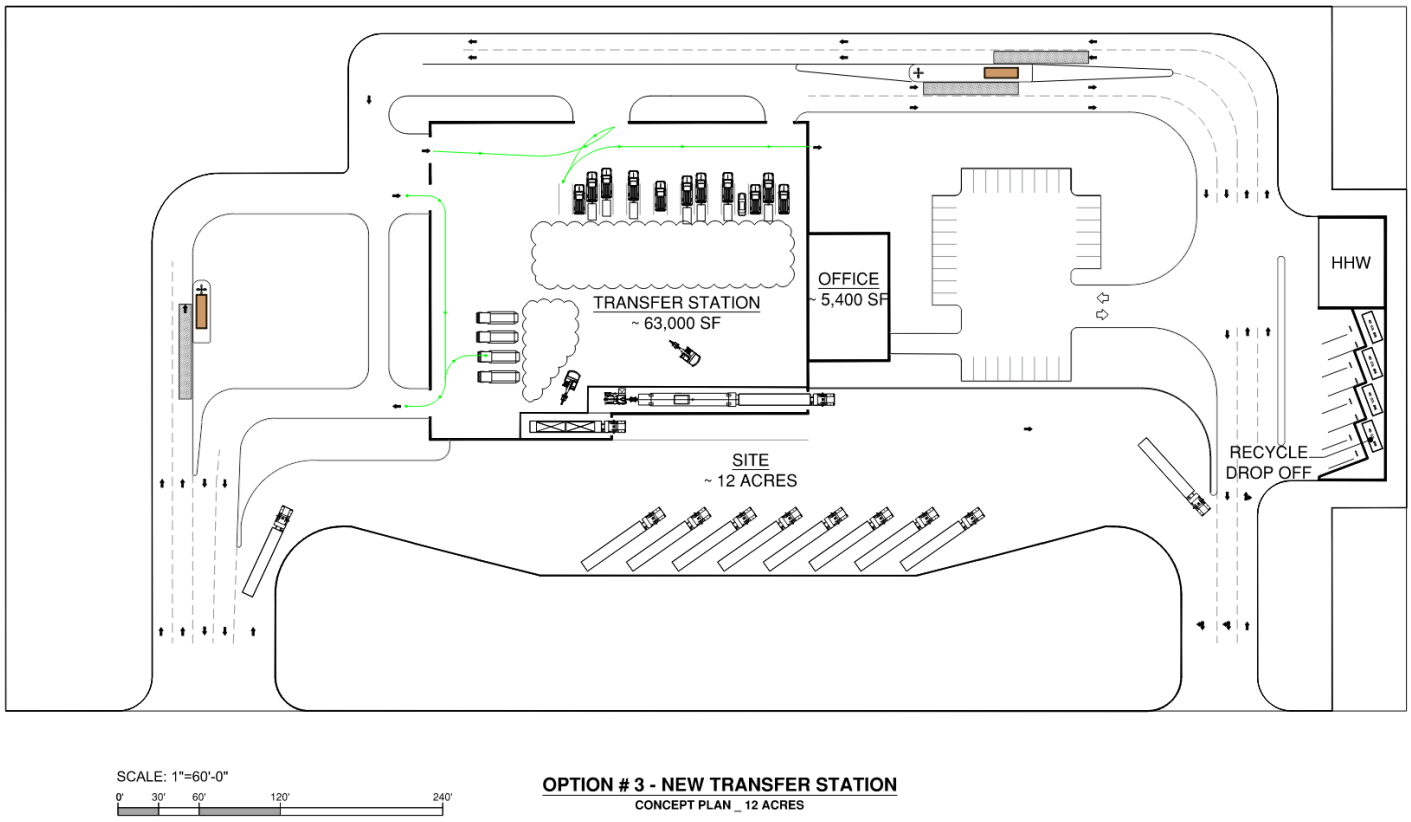



**Figure 6: CTR Concept MRF Site Plan**

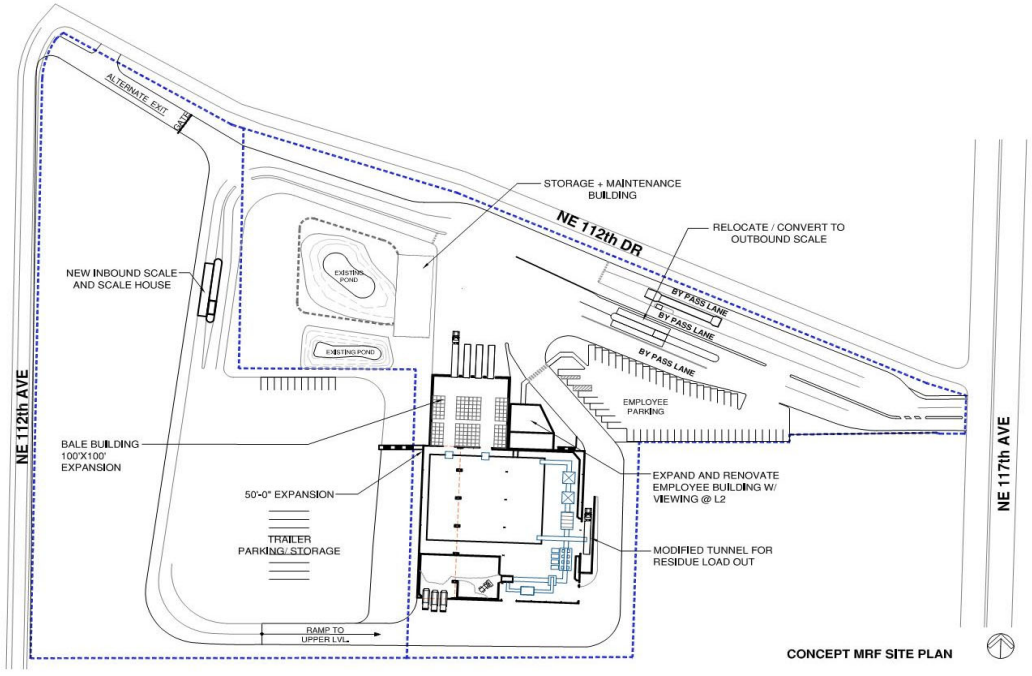


**Figure 7: Convert CTR to MRF - Floor Plan**

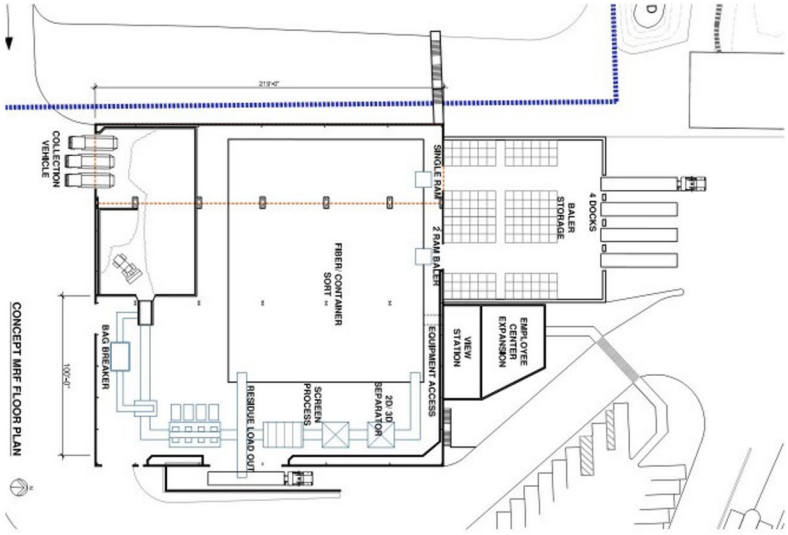



**Figure 8:Washougal Site Map Showing Improvements**