



REGIONAL
DISTRICT
OF NANAIMO



Solid Waste Asset Management Plan

2020-2042

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Executive Summary

This RDN Solid Waste Asset Management Plan (AMP) 2020 (the Plan) forecast the financial standing of the Regional Landfill, Church Road Transfer Station as well as considering the delivery of zero waste programs until 2042. The Plan also calculates, forecasts and budgets all Capital Projects, Capital Purchases, Operating Expenses and Reserve Funds over this 22 year period.. The Plan ensures that the core infrastructure owned and operated by RDN Solid Waste Services is maintained and replaced in a fiscally responsible and operationally efficient manner.

The Regional District of Nanaimo Solid Waste Services carries out planning, operational and administrative functions aimed at achieving zero waste. The department operates two disposal facilities, the Regional Landfill and the Church Road Transfer Station. Solid Waste Services also provides contracted Curbside Collection to over 30,000 households across the District. The Zero Waste Department (ZWD) develops and implements district wide programs aimed at achieving the goals of the Solid Waste Management Plan (SWMP). The ZWD also provides public information, manages Waste Stream Management Licenses and provides Provincial and Federal Reporting to meet obligations.

The Plan is consistent with the Regional Board and Ministry of Environment and Climate Change Strategy approved Solid Waste Management Plan (SWMP). The Plan fully funds operational and capital costs while continuing to build the Post Closure Reserve Account. Surpluses, when generated, are accrued to offset future departmental costs. Costs are apportioned so that the beneficiaries of the services are paying their appropriate costs, which is consistent with a user pay system. Program costs are consistent with those set out in the SWMP and serves to ensure that; Capital Projects, Capital Purchases, Operating Expenses and that the Final Closure of the Landfill are balanced with population growth and the diversion rate achieved for the District.

The Plan accounts for 200 years of post-closure care of the existing landfill, consistent with provincial regulatory requirements. Additionally, the Plan contemplates funds for either siting of a new Landfill or the conversion/development of the existing asset to a Transfer Station model.

The Plan assumes that population growth remains steady at ~2% per year. The Plan also forecasts inflation relative to historical data over the next ten years (2020-2030) and at 1.2-2% from 2031-2042. The Plan was informed from Solid Waste asset condition assessment which determined that most assets are in good working condition and meet the immediate and near future needs of the department.

The individual Solid Waste Departments are maintaining assets and planning capital services according to approved Financial Plans. The Department currently owns a large inventory of infrastructure, with an average useful life span of 20 years. Current replacement costs (Table 1) are estimated to be \$20M, at present Solid Waste Services maintains reserves totaling \$6M. The 10-year Solid Waste budget accounts for average annual Capital Expenditures totaling approximately \$1,240,000.

Table 1: Asset Replacement Costs

Asset Replacement Costs	Regional Landfill	Church Road Transfer Station	Total Solid Waste Services
Total Replacement Costs	\$ 11,099,586	\$ 8,897,309	\$ 19,996,895
Lifecycle Period	40	70	70
Average Useful Life	13	28	20
Average Annual Replacement Costs	\$853,814	\$320,047	\$1,173,861
Capital Reserve Opening Balance	-	-	\$ 5,991,000

1. Background

The Regional District of Nanaimo (RDN) Solid Waste Services provides programs and services as regulated under the Ministry of Environment and Climate Change Strategy (MOECCS) approved RDN Solid Waste Management Plan designed to manage waste and increase waste diversion. The Department provides operation of two Solid Waste Facilities, advocacy for Provincial/Federal waste diversion programs while ensuring residential and commercial waste is managed in an approved, environmentally safe manner.

The Solid Waste Services Asset Management Plan (AMP) 2020-2042 ensures that the requirements of a functioning, balanced, fiscally planned Asset Management Plan has been achieved for the department. It provides clear direction in the funding of Solid Waste Operations over the next two and a half decades. As the life span of the landfill begins to enter its final phase and nears closure, actions will be developed to ensure the residents of the RDN continue to receive the services they rely on. In this regard, the Plan contemplates funds to be applied to a replacement service following landfill closure.

The AMP utilizes the 10-year budget forecast set out in the Solid Waste Management Plan which includes Tax Requisition implications. Beyond the first 10 years, costs have been projected until the closure of the Regional Landfill and include Capital Projects, Final Closure, Operations and considers influences that affect Solid Waste Services.

Based on the Solid Waste Management Plan the Department identified assets in RDN Solid Waste Services in:

- Solid Waste Facilities
- Curbside Collection Services
- Zero Waste Programs

In the RDN, waste is sourced from the residential, institutional and commercial sectors. The total amount of waste disposed (i.e. excluding that which is reused or recycled), divided by the population yields the regional per capita disposal rate.

The 1980s baseline for waste disposal in the RDN was 1,084 kg/capita/year. Over the past 36 years, the RDN waste disposal rate has been reduced by approximately 50% to 550 kg/capita/year in 1990 and, by 68% to 347 kg/capita/year in 2014. The target for the amended Solid Waste Management Plan is to further drive diversion to 90% and/or a per capita disposal rate of 109 kg/year by 2027.

The Regional Landfill has capacity until 2043 based on the current landfilling rates. The long-term goal of the RDN is Zero Waste. Depending on the implementation schedule and success of further diversion initiatives, the life of the landfill could be extended for an additional 10 to 15 years. Nevertheless, the RDN recognizes that there will be some necessary landfilling capacity for the foreseeable future.

The RDN is responsible for operating and maintaining the environmental control infrastructure at the Regional Landfill site for a minimum post-closure period of 200 years. A closure fund has been established to address the long-term operation and maintenance of the leachate and landfill gas collection systems. The closure fund will also provide for the on-going monitoring of groundwater, surface water, landfill gas, erosion, slope stability and settlement to ensure environmental stewardship.

The RDN Solid Waste Management System is influenced by six main policies:

1. The user-pay system.
2. Variable tipping fees.
3. Disposal and collection bans.
4. Private sector waste management.
5. Open burning restrictions; and
6. Provincial product stewardship programs.

The first four policies fall within the scope of the AMP. Burning restrictions are applied through provincial regulations (e.g. Open Burning Smoke Control Regulation) and augmented by RDN and municipal bylaws. Provincial product stewardship programs are regulated by MOECCS and significantly influence the management of specific waste materials generated in the RDN.

1.1. Solid Waste Facilities

The Department owns and operates the Regional Landfill and the Church Road Transfer Station. The Regional Landfill is located at 1105 Cedar Road, five kilometers south of downtown Nanaimo. The site opened in the 1940s and is approximately 37 hectares in size. The 13.7-hectare operational area of the site has a high-density polyethylene liner and has been receiving municipal solid waste since 1991. The 8.8-hectare unlined portion of the site was closed in 1996. The Regional Landfill operates under an operational certificate issued by MOECCS. Landfill gas and leachate are collected from the landfill site. Leachate is directed into the sanitary sewer system for treatment at the Greater Nanaimo Pollution Control Centre. The landfill gas collection system directs the gas to a privately owned and operated facility which uses the landfill gas as a fuel in internal combustion engines to power a generator for electricity production. The Regional Landfill is open to the public seven-days a week (excluding statutory holidays). Waste is accepted with tipping fees charged based on weight and material type.





The Church Road Transfer Station (CRTS) is located at 860 Church Road, four kilometers southwest of Parksville. The facility opened in 1991 and was redeveloped in 2009/2010 to meet the needs of the growing region and to extend the facility's lifespan.

The site is approximately two hectares in size. The CRTS receives garbage, food waste, yard waste, wood waste, construction/demolition waste, and recyclables from communities in the northern portion of the Regional District of Nanaimo: Parksville, Qualicum Beach, and Electoral Areas E, F, G, and H. The CRTS is open to the public seven-days a week (excluding statutory holidays). Waste is accepted with tipping fees charged based on weight and material type. Material brought to the CRTS is transferred to the appropriate licensed disposal facilities within the RDN.

2. Solid Waste Asset Management Funding

The Department collects revenues through Board approved tipping fees for materials accepted at the Regional Landfill and Church Road Transfer Station. A tax requisition, prescribed by the Board approved Solid Waste Management Plan, is collected annually and is applied to the costs of Zero Waste programs.

The curbside collection service is fully funded by user utility fees and contract funding from Recycle BC for residential recycling collection. The service is not augmented by taxation. The RDN solid waste program, other than curbside waste collection, is primarily funded by landfill tipping fees augmented by a tax requisition. In 2020 this split was approximately 90% tipping fee revenue and 10% taxation. These revenues are applied to solid waste program costs including operation of the Regional Landfill and CRTS, organics waste management, illegal dumping mitigation, education, policy and regulatory work. Very minor revenues are received through grants, sale of asbestos bags, and licensing fees associated with the Waste Stream Management Licensing (WSML) program.

The 2019 base tipping fee for Municipal Solid Waste (MSW) is \$130/tonne. Fees for other materials are varied and are based on the cost to handle and process the material and/or to motivate diversion. For example, the 2019 tip fee for asbestos waste is \$500/tonne and is based on the landfill airspace consumption and the direct handling costs for management of the material. In the case of commercial/demolition material containing recyclables, the 2019 tipping fee is \$130/tonne and the application of a 20% surcharge due to the recyclable content. The intention with this latter example is to provide an incentive to source separate and divert waste.

This report identifies the Department Budget with escalation factors from 2020 – 2043. All Major and Minor Capital Projects including temporary and final closure plans, as well as the replacement of all heavy and other equipment has been analyzed, budgeted and planned. All assets in excess of \$500 and that are expected to require replacement have been factored over the 23-year budget timeline. The AMP is intended to be used to inform Solid Waste Services annual budgets..

3. Solid Waste Asset Management

3.1. Updating the Asset Registry

A registry of all assets requiring replacement over \$500 in value has been developed for the Regional Landfill front end, Regional Landfill Operations and Church Road Transfer Station. This registry is updated quarterly for; new items, replaced items, replacement value, life span, damage affecting useful life and general condition. The three sections of the registry themselves are assigned to senior solid waste staff for maintenance and updating. Bi-annually the Solid Waste Asset Management Team will review the registry, values, asset classes and update the solid waste financial plans accordingly.

Maintaining the Solid Waste Asset Registry is essential to ensuring the Solid Waste Budget remains accurate and financially viable.

3.2. Solid Waste Financial Plan

The current RDN Solid Waste Financial Plan accounts for all Major and Minor Capital Projects, heavy equipment replacements and operational costs over a ten-year period.

Significant capital projects, such as landfill cell closure, are forecasted using information developed through external engineering studies. The value of these projects is then applied to the Capital Plan. Capital equipment is budgeted for replacement on service life every three to ten years based on industry practice and RDN experience through historical use. The actual lifecycle and replacement values are assessed bi-annually.

Minor Capital assets are budgeted for replacement as they end their useful life. For example, there are currently 17 portable radios at the Regional Landfill, the current AMP schedules replacement of the 2 oldest radios each year. In this way the costs associated with this asset class are capitalized over a longer period and the effective and useful life can be maximized.

3.3. 2019 Combined Asset Data Summary

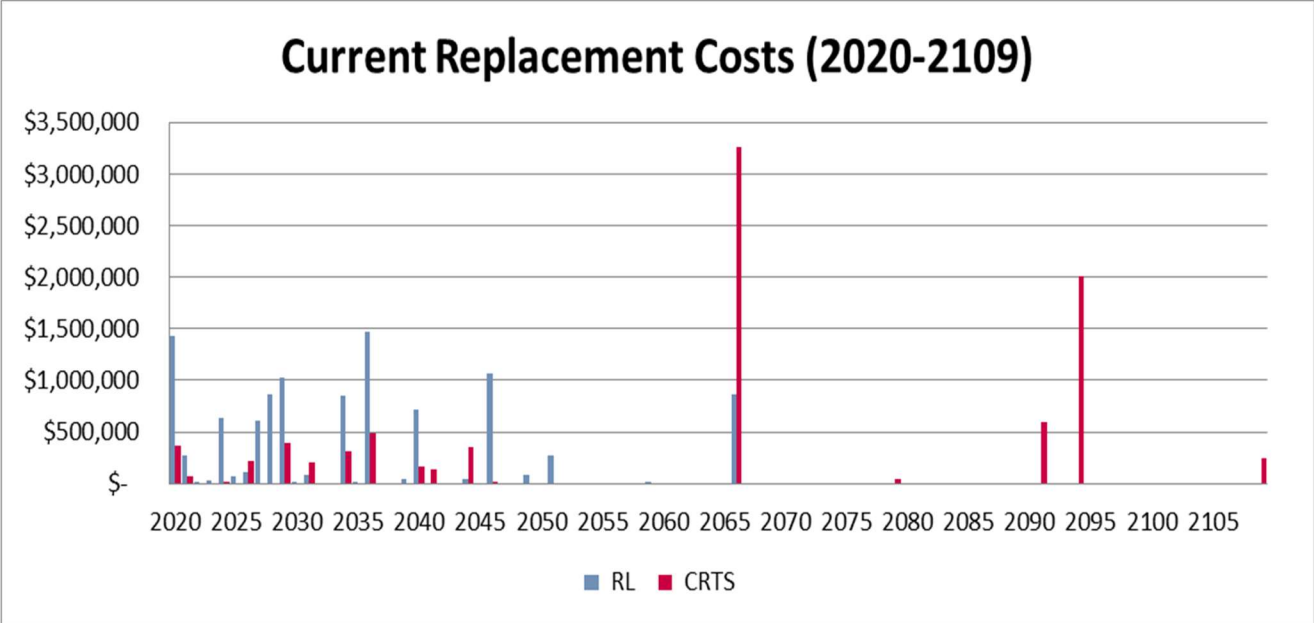
Table 2 Solid Waste Asset Summary - 2019

	Regional Landfill	Church Road Transfer Station
Data Confidence Rating	4	4
Total Replacement Value (2016 Dollars)	\$8,300,000	\$6,800,000
Lifecycle Period	40 years	70 years
Average Useful Life of All Assets	17.6 years	25.4 years
Average Annual Replacement Cost	\$470,000	\$245,000
Post-Closure Reserve Fund Opening Balance (2018)	\$1,844,000	N/A
Capital Reserve Opening Balance (2018)		\$5,151,000

3.4. Replacement Costs

The graph below highlights replacement costs at each Solid Waste Facility, revised to match current asset life cycles, planned replacements and major capital purchases and projects.

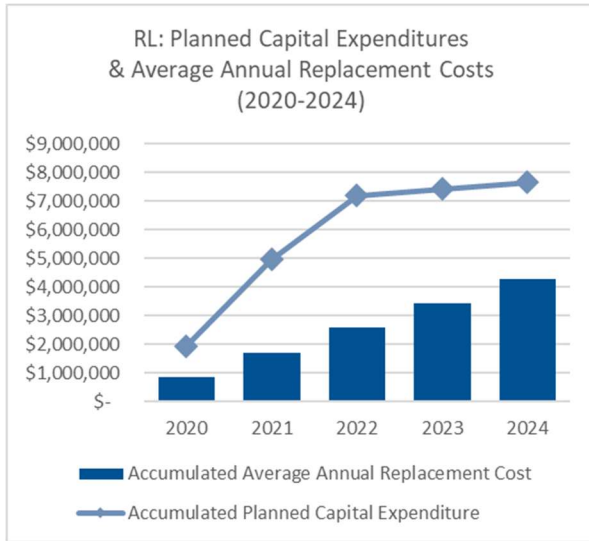
Figure 1 Current Replacement Costs (2020-2109)



3.5. Planned Capital Expenditures

The following two graphs represent the Planned Capital Expenditures at both the Regional Landfill and the Church Road Transfer Station over the next five years. The Regional Landfill’s costs are higher due to temporary and final closure of landfill cells. In addition to being a regulatory requirement, progressive closure of the landfill ensures effective use of airspace, cost effective operations and helps to minimize negative effects on environment. These projects are directly related to the amount of material being landfilled, as diversion efforts increase the proposed closure can be extended to later years. The capital expenses are funded from Capital and Operating Reserves.

Figure 2 Planned Capital Expenditures and Average Replacement Costs 2020-2024



3.6. Age and Asset Conditions

Assets are identified based on type, useful remaining life span and value. In this way replacement costs relative to approved budget and financial plans can be amortized ensuring a balanced bottom line.

In the graphs below the assets of both the Regional Landfill and Church Road Transfer Station are viewed in terms of useful life span. The End of Life sections are primarily comprised of Heavy Equipment slated for replacement in the next two years. For example, in 2020 the Regional Landfill Packer and the Church Road Transfer Station Backhoe are scheduled for rebuild and replacement.

Figure 3 Assets by Age Class – SW Facilities 2020

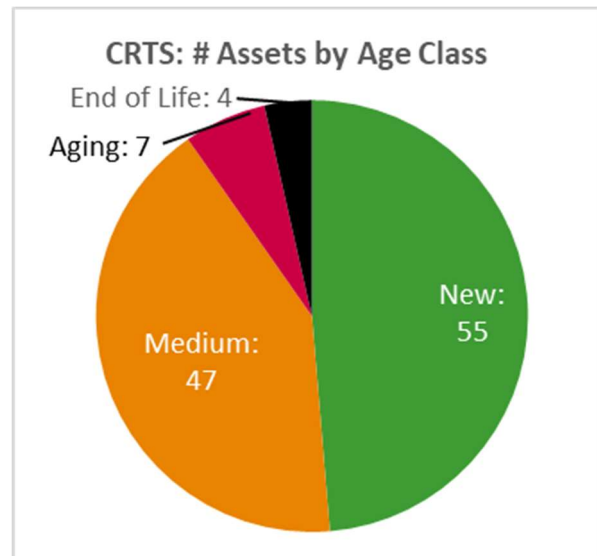
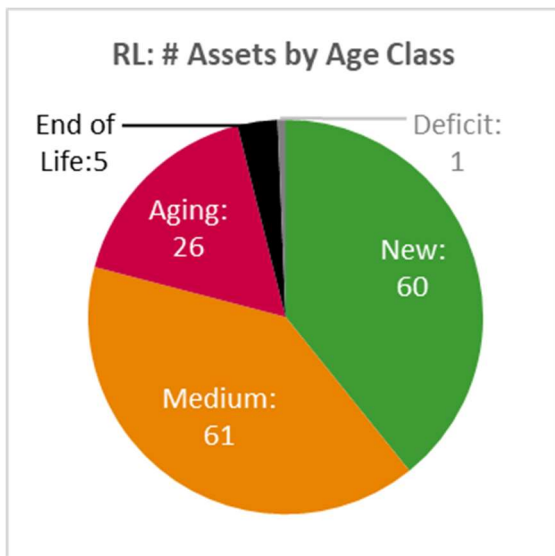


Figure 4 Regional Landfill Asset Value by Age Class – 2020

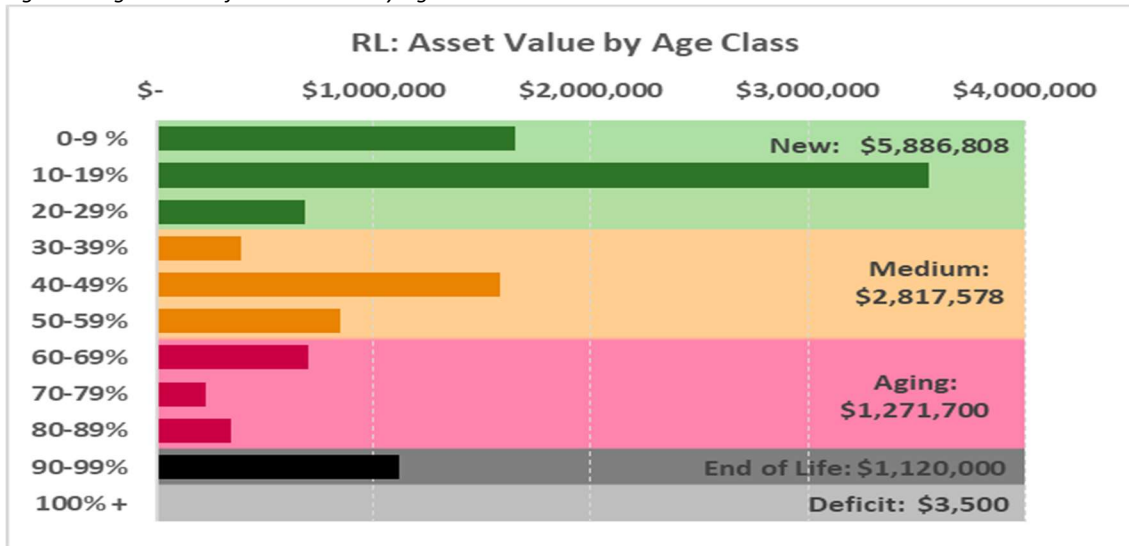
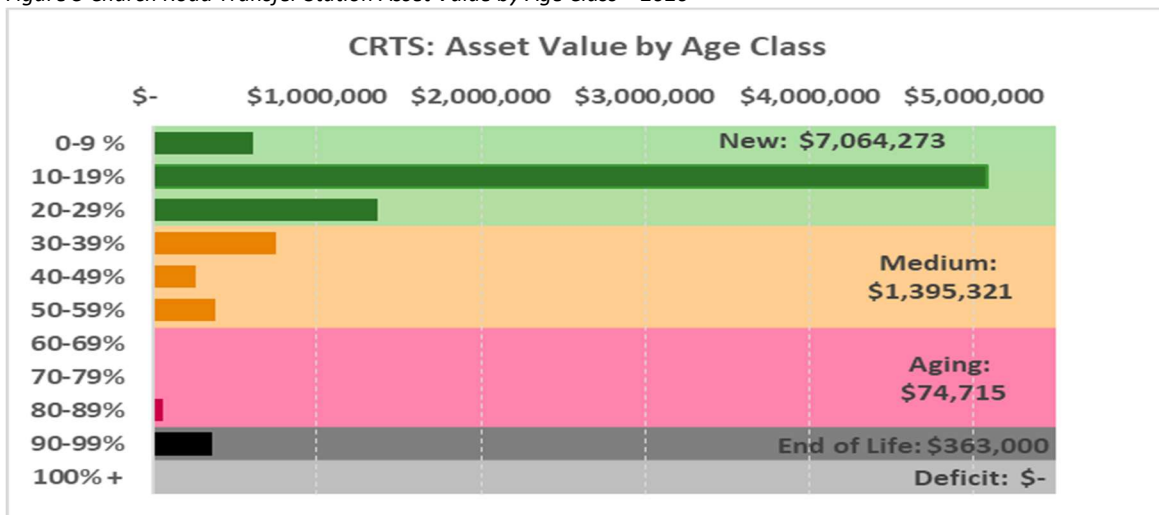


Figure 5 Church Road Transfer Station Asset Value by Age Class – 2020



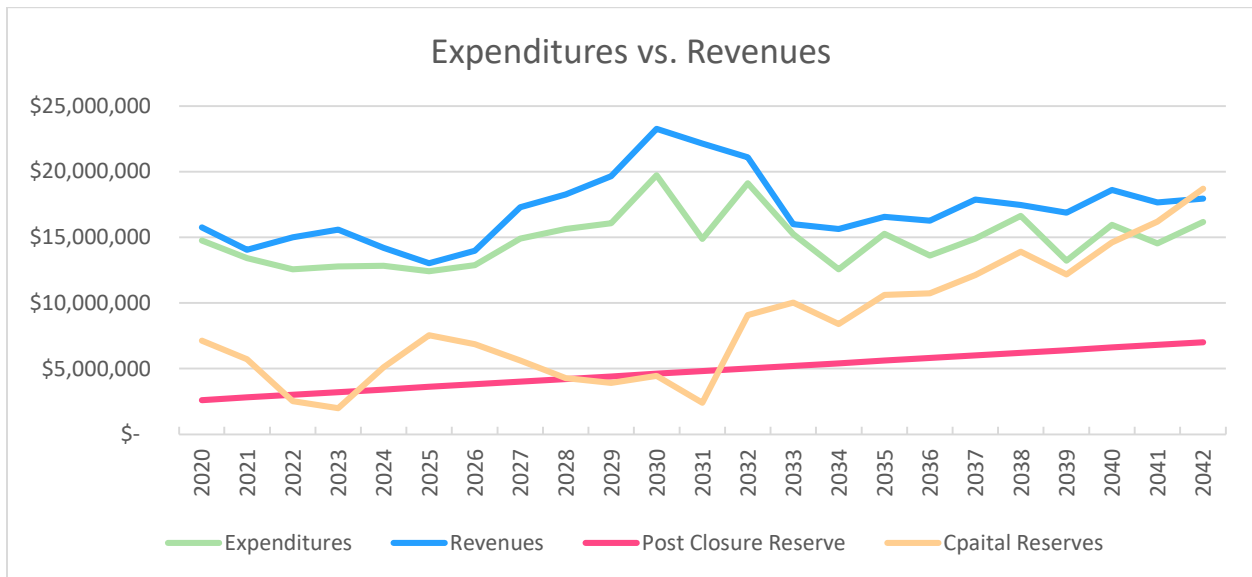
4. Budget Plan

The RDN Solid Waste Asset Management Plan highlights the financial needs of the Solid Waste Services Department. To remain financially viable and fiscally responsible, while ensuring environmental stewardship and service delivery is maintained, values should be reviewed and updated yearly in accordance with annual budget development.



Over the next two and a half decades Regional Landfill and Church Road Transfer Station operations will continue and include: temporary and final cell closures; expansion; Capital Purchases; upgrades to infrastructure; and the projected final closure of the landfill.

Figure 2 Projected Expenditures vs. Revenues



4.1. Expenditures

Several major projects culminating in the final closure of the Southwest Berm and expansion to the final South Cell are scheduled to occur in the late 2020's to mid-2030's. Figure 3 provides projections based on current fill plans, material volumes and reflect potential saved airspace from the Solid Waste Management Plan. The spike in the 2019-2020 Operational Expenditure line is due to the creation of the Operating Reserve, a transfer from surplus to this account creates a one-time spike in expenses. Over the length of the plan Operational Expenditures increase in accordance with inflation, historical data and projected increases to individual budget lines.

Figure 3 Projected Expenditures Summary based on 85% waste diversion rate

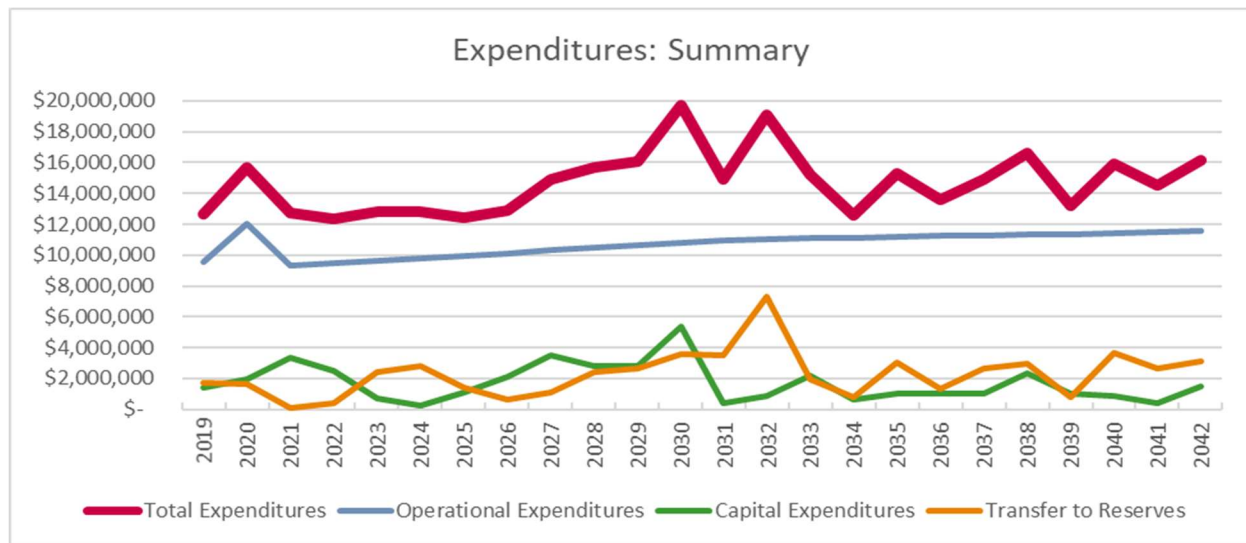
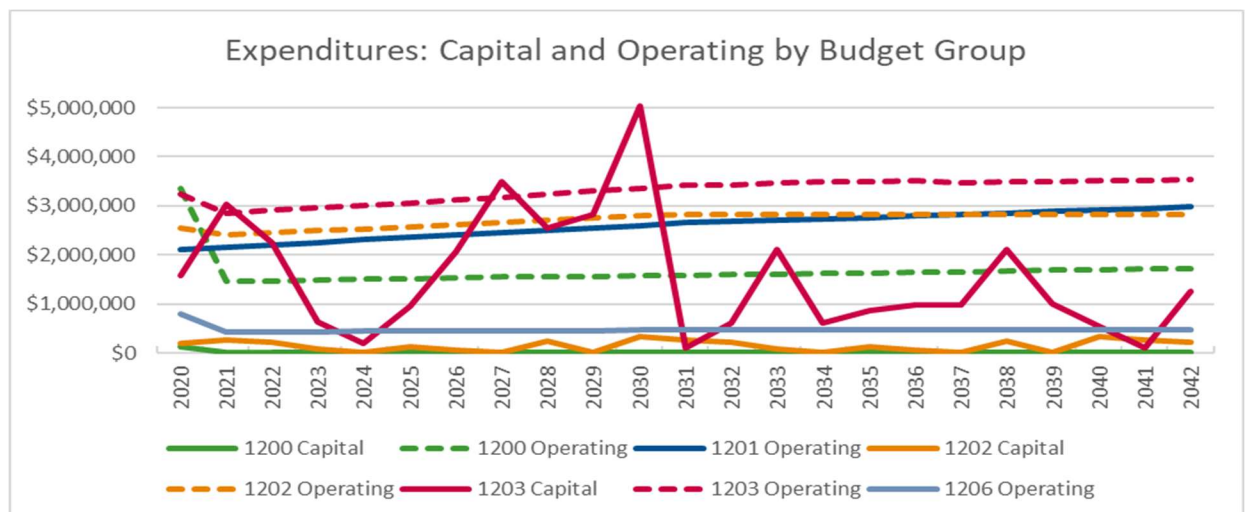


Figure 4 identifies Landfill Operations Capital Projects remain the highest expenditures for the Department and are funded from Operating Surpluses. The AMP provides for these expenses without the need to borrow money.

Figure 4 Capital and Operating Expenditures by Budget Group

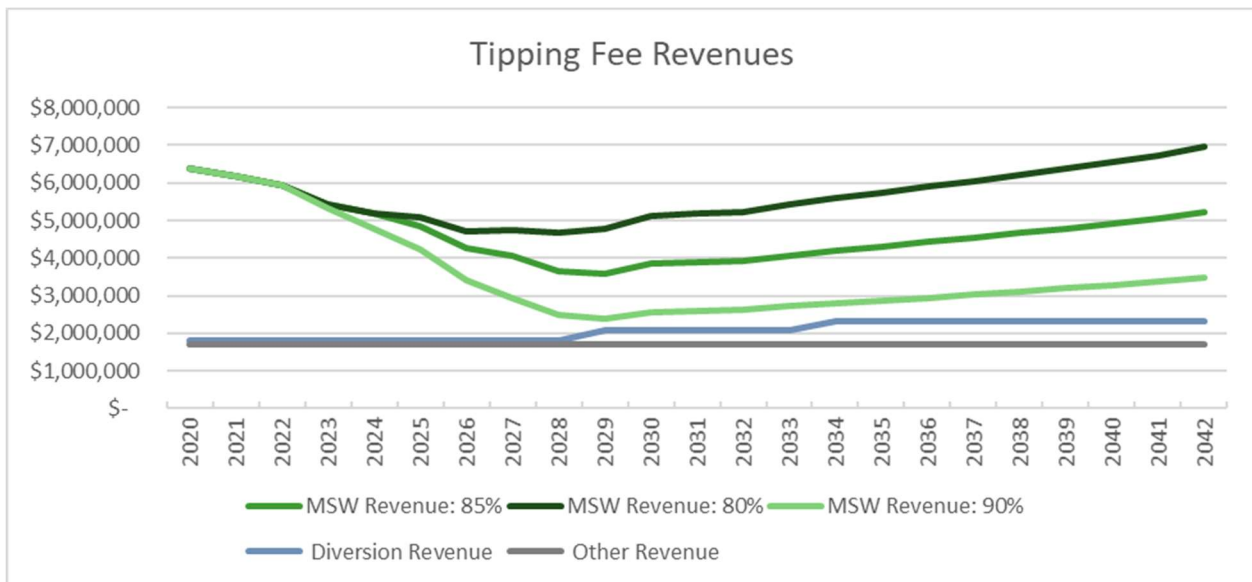


4.2. Revenues

Revenues are generated via the Tipping Fees generated from materials brought to the Regional Landfill and Church Road Transfer Station. The Board approved Solid Waste Management Plan seeks a diversion goal of 90%. This will dramatically reduce Tipping Fee Revenues over the next decade. The Solid Waste Management contemplates this reduced revenue and provides projections if offset solely by tax requisition

The AMP bases revenues on achieving 85% reduction. Revenue projections for 80% and 90% are also presented to provide a confidence interval.

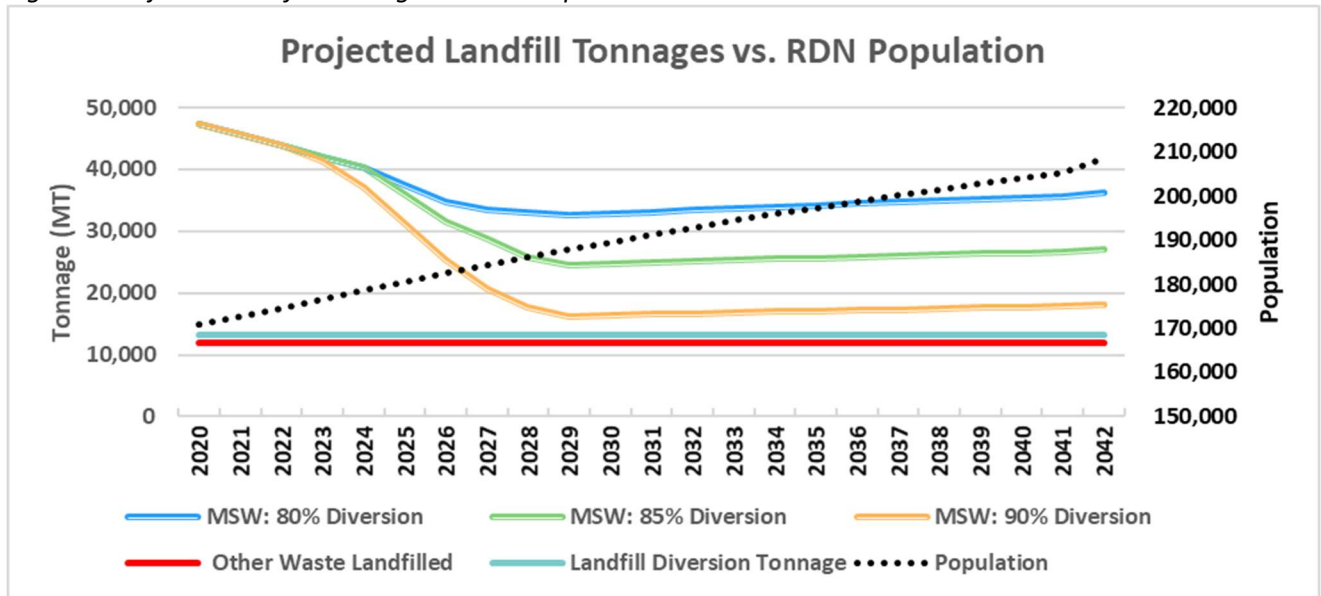
Through sound financial planning and the saving of projected surpluses in the early years of the plan, the impact of the reduced Tipping Fees can be mitigated.



Projected Landfill Tonnages

The total material landfilled is expected to decrease relative to the effectiveness of the Solid Waste Management Plan. Projections, provided below, illustrate the total material received at the Regional Landfill relative to the SWMP's effectiveness. For detailed projects see Appendix 2.

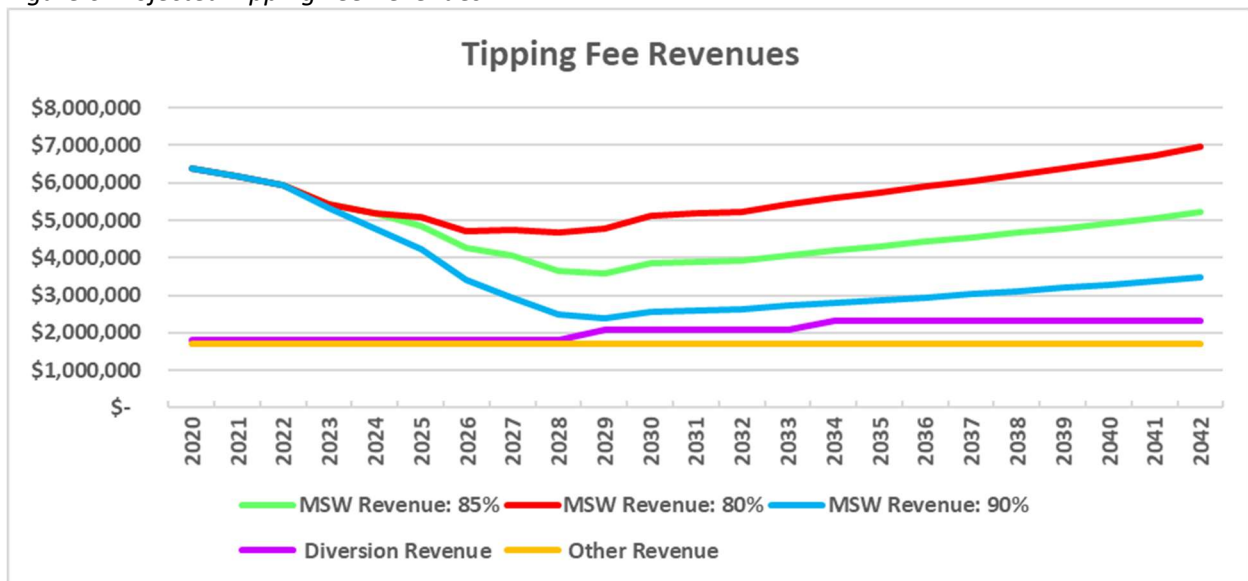
Figure 5 Projected Landfill Tonnages vs RDN Population



Projected Tipping Fee Revenues

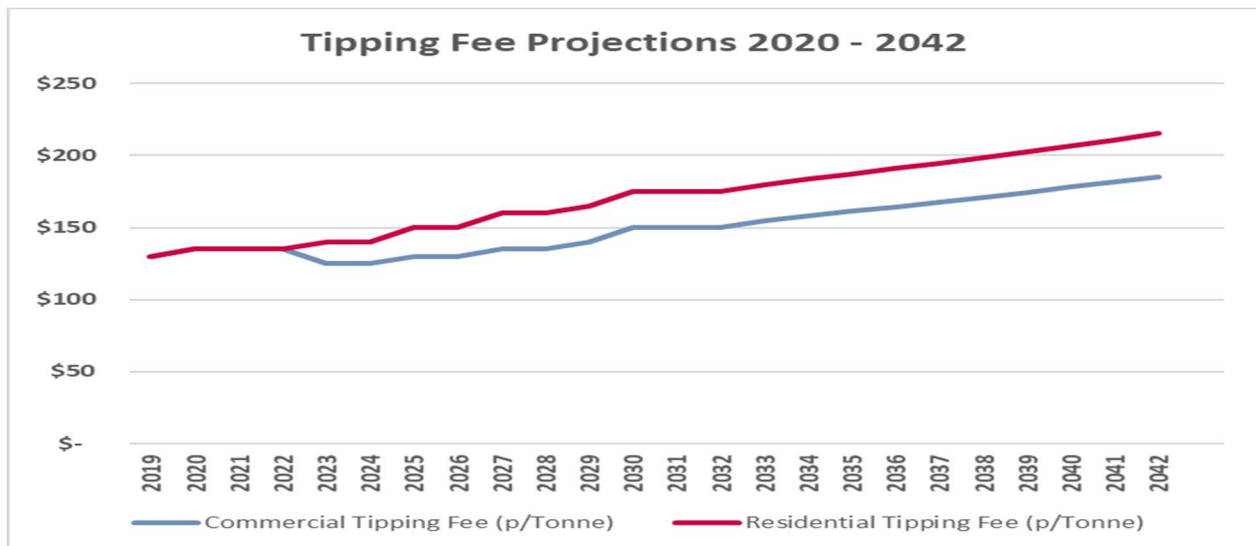
Figure 6 shows the reduction of tipping fee revenue, relative to the success of the Solid Waste Management Plan. For the purpose of the AMP an average diversion rate of 85% by the late 2020's was used. The higher the waste diversion rate achieved the lower the tipping fee revenues that will be received.

Figure 6 Projected Tipping Fee Revenues



The AMP projects increases to Tipping Fees in accordance with SWMP program implementation and to provide for a balanced Solid Waste budget. These tipping fees are commensurate with other local governments in the area and are conservative. Vancouver Island tipping fee values are likely to increase at a faster pace than the projected in this plan.

Figure 11 Projected Tipping Fees 2020-2042



Tipping Fees generated from MSW, which currently total ~9.3M per year, can be expected to drop by 3% for each 1% increase in diversion. The 2019 RDN Diversion Rate was calculated at 68%, an increase to 75% diversion would result in a reduction to the Tipping Fee Revenue of ~\$1.3M.

Tax Requisition

The Solid Waste Management Plan provides for a tax requisition to assist funding for operational and program costs over the next decade. The success of diversions programs through the Solid Waste Management Plan, will determine the need for future tax requisitions relative to program and operational requirements as shown in Figure 12. Figures 13 and 14 show the proportionate revenues of taxation/tipping fee under 80% and 90% diversion scenarios. These two scenarios are shown to provide confidence intervals; note that the landfill closure date has not been factored in under either of these two scenarios.

Figure 12 Projected Tax Requisition based on Waste Diversion Scenarios

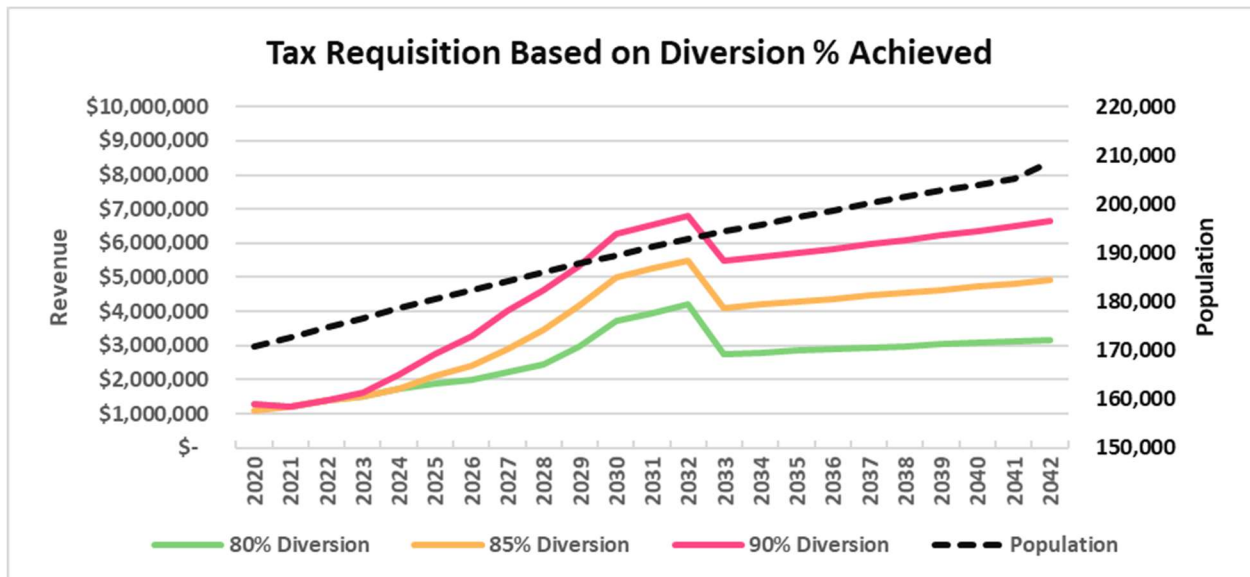


Figure 13 Revenues - 80% Diversion

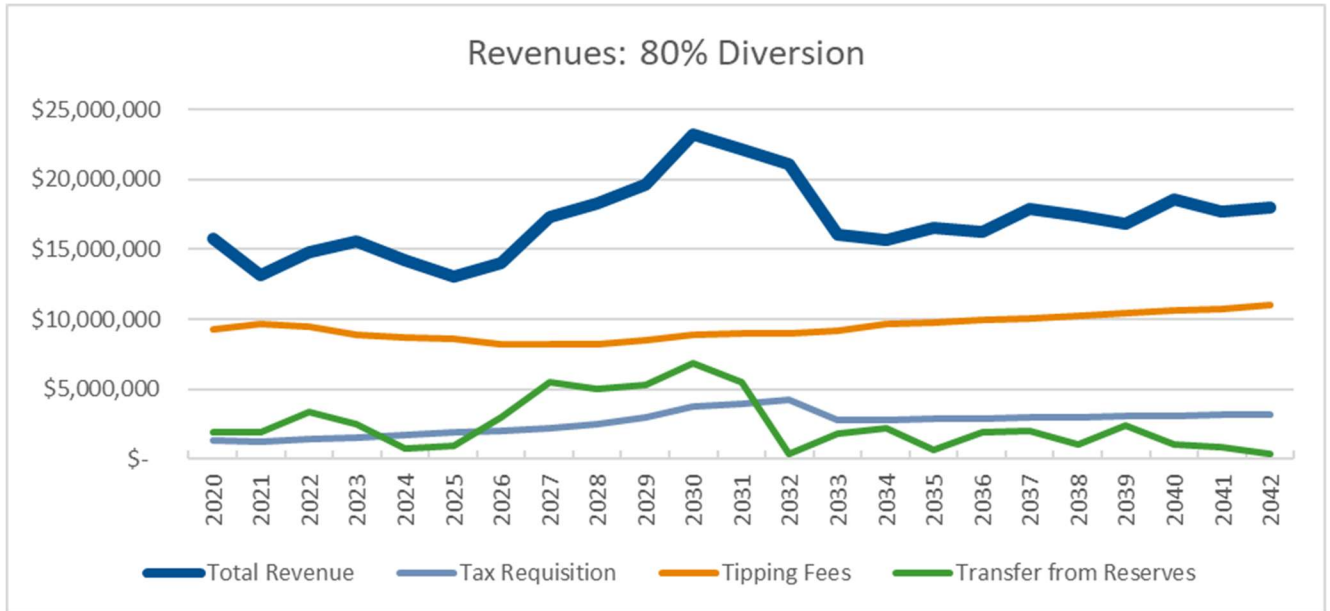
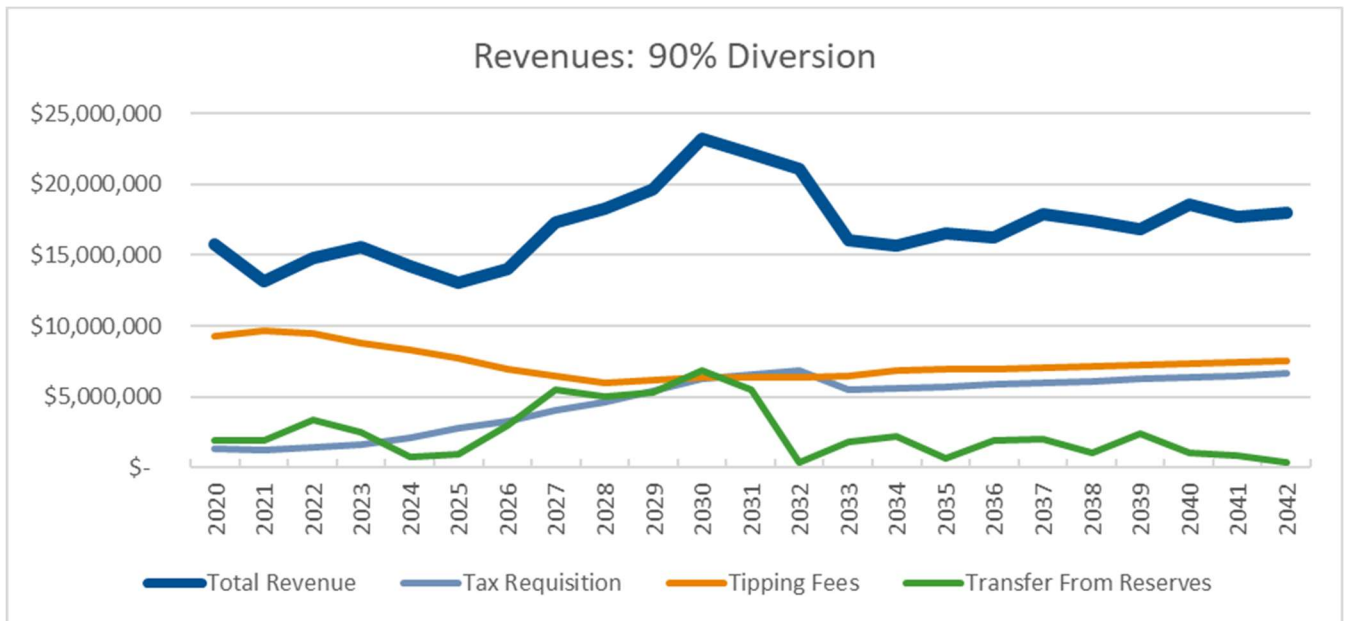


Figure 14 Revenues - 90% Diversion



4.3. Reserves

Solid Waste Reserves provide a key function within the department. The funds are utilized for major capital projects and purchases. The balance grows based on the previous years budgeted surplus. As of 2019 there are three Capital Accounts within Solid Waste: the SW Capital Account (\$5.1 M in 2019) the Post Closure Account (\$2.1 M in 2019) and the Operational Reserve which is to be opened in 2020.



The Solid Waste Management Plan provides funding to Nanaimo Recycling Exchange in the amount of \$300,000 annually from 2019 to 2023. This Plan proposes to set up a fourth reserve account from which to disperse these funds from and any residual could be re-appropriated by the Board in future years.

Capital Reserve

Major projects up to 2031 are funded from the Capital Reserve accounts. After 2031 the Capital Reserve and Operating Reserve balances are depleted but grow over time to provide for a replacement service (e.g. siting landfill or transfer station) once the landfill is closed.

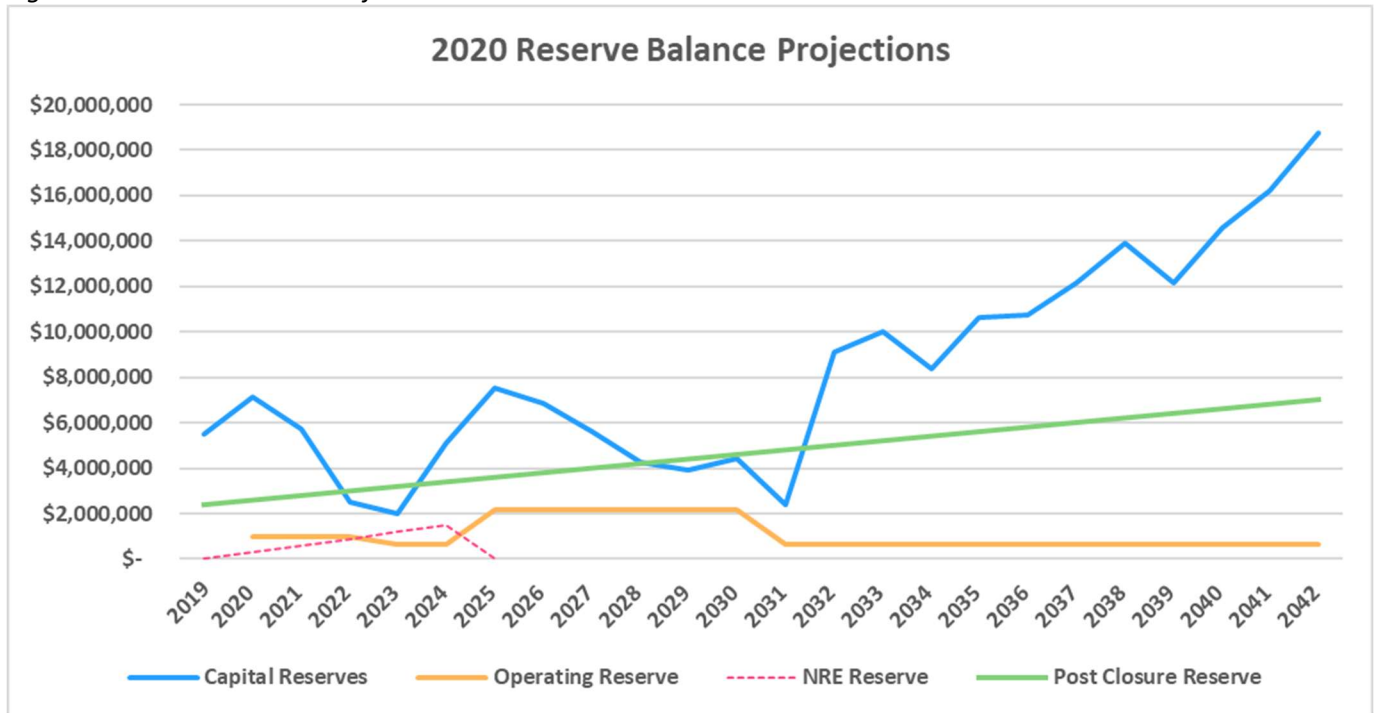
The effectiveness of the current and future Solid Waste Management Plans could affect this timeline. The more effective the diversion programs, the lower the resulting tipping fee revenues. Annual review of the AMP in consideration of such factors as market shifts, local, federal and global economic drivers, actual wastes being landfilled, and long-term projections is advisable.



Reserve Balances

The Regional Board approved funding to NRE in the amount of \$300,000 per year for five years. These funds have not been utilized since their inception in 2019. The graph below assumes a yearly contribution of \$300,000 from 2019-2023 at which time the unspent funds will be redirected to Solid Waste Operations or Programs at the direction of the Board.

Figure 14 Reserve Balance Projections 2020-2042



5. Conclusion

The Solid Waste Asset Management Plan was developed to work in unison with the Solid Waste Management Plan and provide departmental direction over the next twenty-three years. Operational considerations such as population increase, inflation and the goals of the Solid Waste Management Plan heavily influenced this Plan.

The Plan is cost effective, does not utilize borrowing to fund operations and relies on a User Pay System. In later years the Plan provides financial options for siting of a new landfill, expansion of the current site or conversion to a transfer station model.

The Plan relies on a tax requisition consistent with the approved SWMP for the first ten years (2020-2030) to offset costs and ensure project and operational viability. In the second half of the Plan (2031-2042) the tax requisition is variable and initially decreases by 22% in 2033 before increasing by an average of 2% over the remaining life of the Plan. These figures are based on the success of the Solid Waste Management Plan, Capital Reserve Balances, changes in Solid Waste Operations and the overall market.

The RDN Solid Waste Management Plan is a forward-looking document that identifies and correlates historical data, the goals of the department as a whole, and serves to meet the financial and regulatory requirements of local government to operate in a fiscally responsible and balanced manner.

