City of Brookings Solid Waste Master Plan – Executive Summary

Prepared for: City of Brookings, South Dakota

Brookings, South Dakota

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Contents

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Acronyms and Abbreviations

CIP	Capital Improvement Plan
City	City of Brookings
Financial Planning Tool	Brookings, South Dakota Solid Waste Financial Planning Tool
GCCS	Gas Collection and Control System
Landfill	Brookings Regional Landfill
LFG	Landfill Gas
Master Plan	Solid Waste Master Plan
MSW	Municipal Solid Waste
SDSU	South Dakota State University
WWTP	Wastewater Treatment Plant

1 Master Planning Process, Goals & Priorities

HDR has been retained by the City of Brookings, South Dakota (City), to develop a Solid Waste Master Plan (Master Plan). The Master Plan is intended to optimize site utilization, provide a clear and efficient vision for the solid waste management system, and plan for the future of the City's solid waste. The documents included in this Master Plan were developed in collaboration with the City, and key elements were shared with stakeholders and the public. The documents include summaries of the current operations for the City's collection and disposal system and provide HDR's recommendations for the future.

The City provides essential solid waste management services to its residents and is committed to providing quality services into the future. The Master Planning process was focused on safety, public trust, and operational and financial sustainability.

Keeping residents and employees safe is of the utmost importance to the City. The Master Plan evaluated which measures can be taken to improve safety during solid waste collection and landfill operations.

Understanding which services are valued and used by residents and landfill users is central to planning for a successful future. The City values input from the public on current services and what they would like to see in the future. Feedback from residents was incorporated into the Master Plan.

Finally, the City strives to provide efficient and cost-effective solid waste services. A financial analysis was performed to ensure that these solid waste services are sustainable for the foreseeable future. The following summarizes HDR's key findings and recommendations following the Master Planning efforts.

2 Existing Systems Analysis

The Existing Systems Memo[1] critically examines the City's current waste management practices, including collections, landfill operations, recycling, waste diversion, and public outreach efforts. The memo established a baseline of operations.

The key findings of this memo include the following.

- The City provides collection services to approximately 6,000 households. Collection services include garbage, recycling, and yard waste.
- Between September 2021 and August 2022, the City collected 4,560 tons of garbage, 811 tons of recycling, and 1,443 tons of yard waste from residents.
- Approximately a third of the waste generated by residential collections is diverted from the Landfill via recycling and yard waste programs.
- Recycling is processed by Waste Connections, Inc. (dba Cooks Waste Paper and Recycling) at their Brookings facility for a fee of $60 per ton.

[1] City of Brookings, South Dakota. 2023. *Existing Systems Memo.* Prepared by HDR, Omaha.

- Garbage is disposed of at the Brookings Regional Landfill (Landfill), which has a $45 tipping fee for municipal solid waste (MSW).
- The Landfill receives 50,000 to 60,000 tons of garbage per year. The Landfill has a remaining life of approximately 35 years.
- The Citizens Campus at the Landfill allows residents to drop off clean wood, lumber, trees, branches, and yard waste. Citizens can pick up finished compost from the Citizens Campus at no charge.
- The City periodically holds special events to aid residents in the disposal of wastes that may not be eligible for disposal in the garbage, recycling, or yard waste carts, including spring cleanup, storm cleanup, and household hazardous waste events.

There were no recommendations associated with the Existing Systems Memo.

3 Benchmarking Cost Report

The City prioritizes providing quality collection and disposal services for a competitive price. HDR prepared a Benchmarking Cost Report[2] to evaluate waste collections, disposal, operations, and fees in cities similar to Brookings. HDR selected ten benchmarking communities in South Dakota and surrounding Midwestern states: Aberdeen, SD; Watertown, SD; Yankton, SD; Mitchell, SD; Dickinson, ND; Williston, ND; Fremont, NE; St. Cloud, MN; Northfield, MN; and Marshall County, IA. HDR attempted to contact all ten communities and completed interviews with seven communities.

The key findings of this report include the following.

- The average rate for residential curbside trash, recycling, and yard waste collection is $24.02 per month.
- The average landfill tipping fee is $55.62 per ton of MSW.
- Nearly all the cities provide curbside recycling services.
- Five cities offer yard waste or compost curbside collection. Only the City of Brookings provides twice-weekly yard waste collection.
- Brookings has the highest diversion rate (approximately 30 percent) compared to available data from the benchmarking cities.
- The cost of services the City provides is lower than average based on the benchmarking cities, as shown in **Figure 1** and **Figure 2** below.

There were no recommendations associated with the Benchmarking Cost Report.

[2] City of Brookings, South Dakota. 2023. *Benchmarking Cost Report*. Prepared by HDR, Omaha.

Figure 1: Average Cost of Collection Services (Trash, Recycling & Yard Waste)

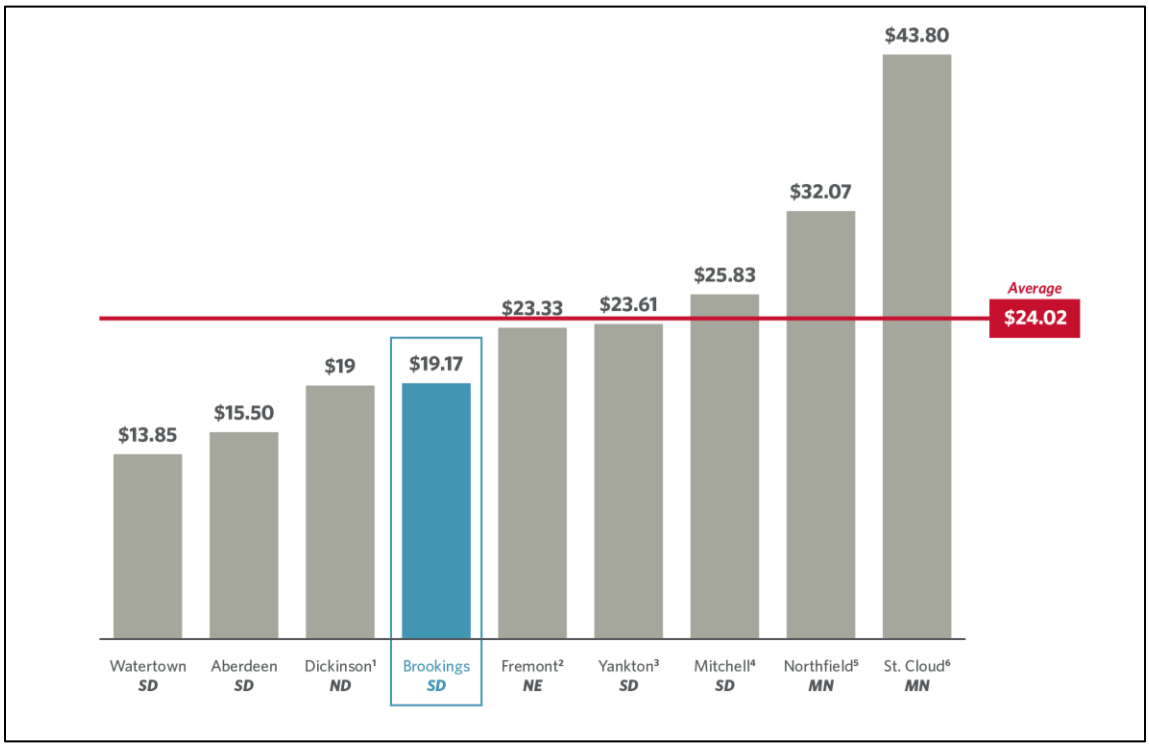
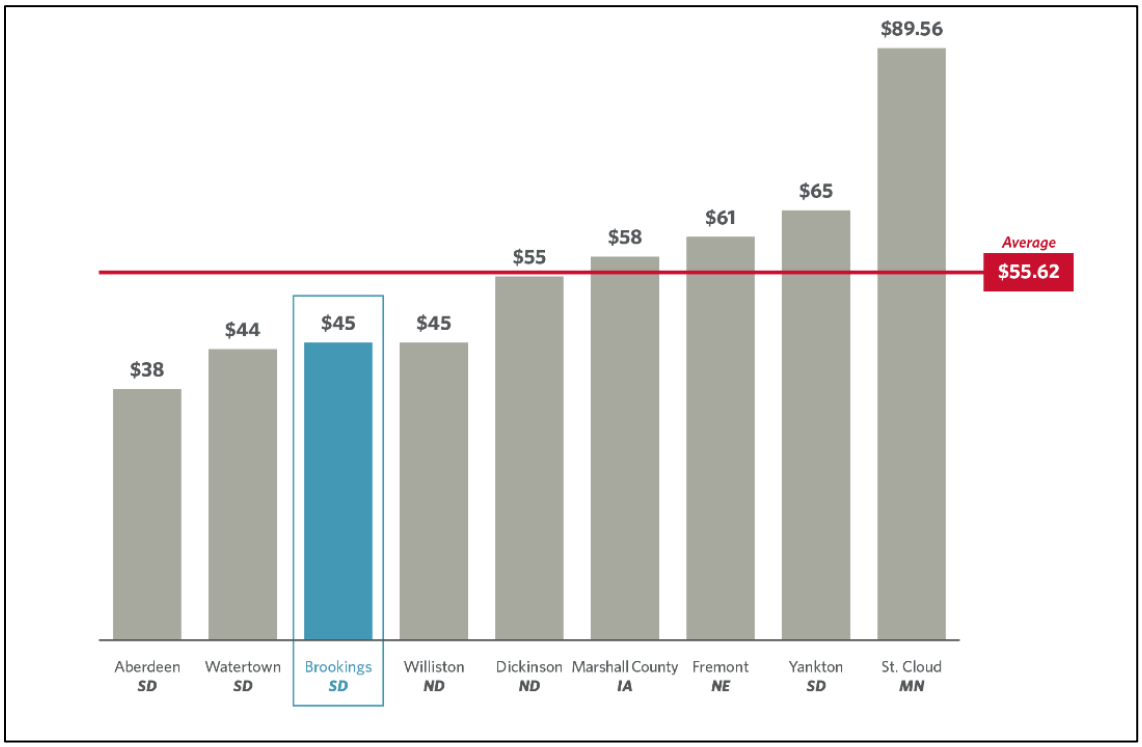


Figure 2: Average Landfill Tip Fee



4 Engagement Workshops

Engaging the local community was a critical component of the Master Planning process. The City is committed to meeting the needs of its residents by providing quality service at a competitive price. HDR facilitated two Engagement Series with both stakeholder groups and the public. The goal of the meetings was to evaluate which services stakeholders and the public currently use, request feedback on additional services that could be provided, and educate the public about the City's current waste management system and potential plans for the future.

The public engagement meetings were both structured into two components. The first meeting was open to invited stakeholders, including neighbors who live in the vicinity of the Landfill, representatives from the Brookings Chamber of Commerce, South Dakota State University Facilities & Services representatives, Cook's Wastepaper & Recycling, Brookings Dumpster Services, Eng Services, and select residents. The stakeholders were invited via email.

Immediately following the stakeholder meetings, HDR facilitated separate public meetings open to interested members of the public. The public meetings were advertised on the City's website and social media accounts.

4.1 Engagement Series One

The first set of engagement meetings was held on March 2, 2023. The purpose of the meetings was to collect feedback on existing services provided by the City and request suggestions for future programs.

The key findings of this public engagement process included the following:

- Stakeholders and the public are generally satisfied with the current services provided. Utilization of available services was high.
- Participants requested additional education, particularly on which items can be recycled.
- Participants who have used the Landfill expressed concerns about public safety, particularly when driving to the active face near trash collection trucks. Stakeholders recommended additional signage onsite and instructions at the scale house.
- Stakeholders had the following suggestions for new and expanded programs.
    - Year-round drop-off site.
    - Food waste program.
    - Expanding spring cleanup to the fall and adjusting the timing of spring cleanup to align with South Dakota State University's (SDSU) move-out schedule.
    - Expanded hazardous waste and electronic waste services.
- Stakeholders listed convenience, cost, and environmental priorities for new or expanded solid waste programs.

There were no recommendations associated with the engagement meetings. However, feedback from the engagement workshops informed Master Planning efforts, particularly when developing the Capital Improvement Plan (CIP).

4.2 Engagement Series 2

The second set of engagement meetings was held on June 1, 2023. The purpose of this set of meetings was to share HDR's recommendations for the Master Plan and request any feedback from stakeholders and the public.

HDR shared the key recommendations for collections operations, landfill operations, collection fees and landfill tipping fees, and public education.

The key findings of this public engagement process included the following:

- The participants of the stakeholder and public meetings were supportive of the recommendations shared. They did not express concerns about the proposed changes.
- One participant asked what the rate increases for collections would be. HDR shared that rate increases are not final yet as the City is still in the evaluation and planning process.

There were no recommendations associated with the engagement meetings. Participants were supportive of the recommendations shared.

5 Brookings Regional Landfill

The City operates the Brookings Regional Landfill. HDR reviewed current operations and the ten-year CIP. HDR staff performed field observations and reviewed data provided by the City. The key findings of this effort were included in three reports, listed separately below.

5.1 Landfill Cell Sequencing, Soil Use, and Closure Planning[3]

HDR reviewed Landfill site operations and existing plans and recommended the following:

- Cell Design
    - Reduce the size of intercell berms.
    - Set the crest of the slope of the cells closer to or on the solid waste boundary.
    - Modify leachate drainage structures so landfill floors slope toward the center of each cell before being conveyed to a pump.
    - Eliminate protective soil cover.

[3] City of Brookings. 2023. *Landfill Cell Sequencing, Soil Use, and Closure Planning.* Prepared by HDR, Omaha.

- Cell Sequencing
    - Consider cell sequencing to prioritize 'filling in the bowl' when possible.
    - Focus on permitting the north expansion area in the near term.
    - Keep the compost area in its existing location.
- Closure Sequencing
    - Phase closures on the east and west side slopes after those areas have settled at/near the top of waste grades.
    - Install a final cover access road.
    - Plan for a flexible end use for the site to accommodate the City's needs at the time of closure.
- Citizens Campus Improvements
    - Relocate Citizens Campus
    - Include public drop-off area with a z-wall, roll-offs for construction and demolition and MSW waste, bays for white goods and rubble, and recycling drop-off bins for cardboard, glass, mixed recyclables, scrap metal, household hazardous waste (HHW), and tires.
- Operations Planning
    - Consider utilizing mobile bull fencing primarily on the fill area's northwest and south/southeast edge to collect windblown litter.
    - Push waste from south to north to reduce windblown waste.
    - Maintain the access road on the south sideslope of the active area.
    - Consider rental or purchase of litter-picking equipment.
    - Consider measures discussed to increase compaction.
    - Decrease percent soil use.
- Based on a review of airspace, HDR anticipates that these measures will increase the life of the site by 2.6 years.
- These measures are anticipated to increase airspace and extend the life of the Landfill, increase the time between cell construction, and secure permitting for the north expansion area to ensure that the City can continue to serve its residents.

5.2 Leachate Planning Report

HDR prepared a Leachate Planning Report[4] to describe the selected path forward for leachate management at the Brookings Regional Landfill. The key findings of this report included the following:

[4] City of Brookings. 2023. *Leachate Planning Report.* Prepared by HDR, Omaha.

- The City currently recirculates its leachate or hauls it to the local wastewater treatment plant (WWTP). Recirculation is a solution that works best for smaller sites located in drier regions.
- The City plans to add a direct connection to the WWTP using a forcemain/sewer line. A direct connection is expected to reduce or eliminate the need for leachate recirculation and hauling. It is considered the most cost-effective option after the initial capital investment of 5,850 linear feet of forcemain.
- HDR recommends installing a direct connection to the WWTP and adding a new aboveground tank to offer the site a location for pre-treatment (if needed) and additional storage capacity.
- Recommended schedule:
    - 2023/2024 – Complete full design of the leachate forcemain with connection to the city sewer and flow towards the Brookings Municipal Utilities WWTP.
    - 2024/2025 – Installation of the leachate forcemain, lift station, and piping to the existing leachate tanks.
    - 2030 – Installation of new leachate tank (this year may move over time-based onsite needs).

5.3 Landfill Gas Report

HDR prepared a Landfill Gas Report[5] to evaluate the future generation, collection, and control of landfill gas (LFG). The following key findings were identified:

- Currently, the Landfill does not have and is not required to have, any LFG collection or control infrastructure.
- A review of the Landfill's modeled LFG production indicates that the City will not be required to install an LFG collection and control system (GCCS) for approximately 20 years. This is based on current regulations, the most recent gas modeling results, and anticipated waste disposal tonnage.

Based on a review of LFG at the Landfill, HDR recommends the following:

- The City could consider installing active or passive gas control features before it is required by regulation.
- HDR recommends installing simple vents at gas sampling locations to vent and repair the cap liner system in approximately 2025.
- HDR recommends that future capping events incorporate passive gas venting, with vents at a frequency of at least one per acre. This can prevent gas from building up and potentially causing migration issues.

[5] City of Brookings, South Dakota. 2023. *Landfill Gas Report.* Prepared by HDR, Omaha.

6 Collection Services Analysis Report[6]

HDR reviewed current operations and the ten-year CIP for the City's collection system. HDR staff performed field observations of collections and reviewed data provided by the City, including schedules, routes, fleet information, service hours and mileage of trucks, and costs.

The key findings of this report include the following:

- The City provides garbage, recycling, and yard waste collection services to approximately 6,000 households.
- The City currently operates five automated side loader trucks, with two older rear loader trucks used as a backup.
- It is an industry best practice to replace trucks every five to seven years. Based on the City's current replacement schedule, three trucks will be at least ten years old at the time of planned replacement.
- The City's garbage, recycling, and yard waste collection routes are not set; therefore, the routes may not be serviced the same way every time.
- The five automated side loader trucks had an average driving distance of about 9,000 miles and an average driving time of about 1,000 hours per truck in 2022.
- The City has spent $289,444 on truck maintenance since 2019. Truck #39, an ASL truck purchased in 2011, has required the highest maintenance costs and had the lowest time and distance usage in 2022.

Based on a review of the City's current collections operations, HDR recommends the following:

- Expand the City's preventative maintenance schedule for garbage trucks and add additional technicians to the City's maintenance staff.
- Increase the frequency of truck replacement to every seven years to align with industry best practices.
- Establish a schedule for replacing garbage, recycling, and yard waste carts.
- Conduct a Route Optimization Study to improve route efficiency.
- Consider decreasing yard waste collection frequency to once per week.
- Add an additional truck and driver to the collections fleet.

7 Financial Evaluation[7] and CIP[8]

HDR conducted a financial evaluation of the collections and landfill operations to determine whether the current rates are adequate to support existing and future

[6] City of Brookings, South Dakota. 2023. *Collection Services Analysis Report.* Prepared by HDR, Omaha.
[7] City of Brookings, South Dakota. 2023. *Financial Analysis.* Prepared by HDR, Omaha.
[8] City of Brookings, South Dakota. 2023. *Proposed Capital Improvement Plan.* Prepared by HDR, Omaha.

operations and expenses. HDR developed the *Brookings, South Dakota Solid Waste Financial Planning Tool* (Financial Planning Tool) to identify the revenue needed to meet capital improvements and operating costs, pay debt service, provide working capital, and fund planned projects. The Financial Planning Tool inputs included planned equipment purchases, capital expenditures, and new construction at the Landfill.

The key findings of this evaluation include the following:

- Based on existing rates and revenues, the collections and landfill funds have positive cash flow.
- The Financial Planning Tool indicated that increased expenses are expected to outpace current revenues in the next few years.
- The initial financial evaluation indicated that the City would need to increase rates for both the collections system and Landfill tipping fees to keep pace with costs and inflation.

Based on the financial analysis, HDR recommends the following:

- Collections system:
    - The revenue analysis for the collections service indicates annual rate increases of at least 1.9 percent are needed for the next ten years to cover planned capital projects and the replacement of aging equipment.
    - The City's existing CIP had a cost estimate of $2.6 M over the next ten years. The proposed CIP has a cost estimate of $5.5 M over the next ten years. The cost increase between the existing and proposed CIP is primarily associated with more frequent vehicle replacements to meet industry standards.
- Landfill system:
    - The revenue analysis for the landfill service suggests minimum annual rate increases of 3.0 percent will be required for the next five years to fund expected new cell construction and the proposed CIP. This also includes targeting a prudent cash on hand balance.
    - The City's existing CIP had a cost estimate of $14.8 M over the next ten years. The proposed CIP has a cost estimate of $22.0 M over the next ten years. The cost increase between the existing and proposed CIP is primarily associated with more frequent equipment and vehicle replacement to meet industry standards. It also includes the cost of a future landfill expansion to the north and associated infrastructure and closure/post-closure funds.

8 Public Engagement

HDR evaluated the City's existing public outreach on the collections and landfill systems. Overall, the city does an effective job of providing information through websites and social sources. HDR recommends the following measures to educate residents on the services Brookings already provides and keep them updated on upcoming events and changes to the collections or landfill system.

- Print and distribute a disposal guide every other year for City residents. The guide could potentially cover the following topics:
    - Overview of the collection and landfill services provided by the City;
    - Illustrated list of materials the City accepts in its recycling and yard waste collections program;
    - Best practices for recycling; and
    - Guide to landfill services, including a map of the Landfill with the location of the Citizens Campus.
- Improve signage at the landfill.
- Use the City website and social media to contact and educate residents about services.
- Continue hosting special waste disposal events for the community, such as the Spring Cleanup, storm cleanup, and household hazardous or electronic waste events.