Transfer Station and Processing Facilities

Overview

The Nebraska Department of Environmental Quality (NDEQ) Title 132 Integrated Solid Waste Management Regulation (Title 132) defines a solid waste management facility as a "*public or private site, location, tract of land, installation or building which has been used for the collection, source separation, storage, transportation, transfer, processing, treatment, or disposal of solid waste, and shall include solid waste disposal areas and solid waste processing facilities.*"

NDEQ's Title 132 defines solid waste processing facilities as "*any facility where solid wastes are processed, and shall include, but not be limited to solid waste compost sites, materials recovery facilities, recycling centers and solid waste transfer stations."* Each of the terms: 1) solid waste compost sites, 2) materials recovery facilities, 3) recycling centers, and 4) solid waste transfer stations are further defined in the Title 132.

By NDEQ's definition a materials recovery facility means "*any facility at which solid waste is processed for the purpose of resource recovery*" and solid waste processing means "*physically or chemically changed, temporarily stored, or salvaged prior to being transferred to a solid waste disposal area or to a secondary materials recovery facility*."

For purposes of this technical paper the term "processing facilities" will refer to only material recovery facilities and recycling centers. Recycling centers also includes recycling collection sites and drop-off sites.

NDEQ defines a solid waste transfer station as "*any site, location, tract of land, installation, or building that is used or intended to be used primarily for the purpose of transferring solid wastes that are generated off of the premises of the facility from vehicles or containers, into other vehicles or containers for transportation to a solid waste disposal area or solid waste processing facility*." In slightly simpler terms a transfer station is a facility where municipal solid waste is unloaded from smaller collection vehicles, temporarily stored, and reloaded to larger trucks (often semi-tractor/trailers) for shipment to solid waste management facility (a solid waste disposal area or solid waste processing facility).

NDEQ regulations include provisions for permitting of solid waste processing facilities, but include a variety of exceptions to these rules. Partial exemptions from NDEQ permit requirements exist for solid waste processing facilities (including composting and transfer stations) when:

- A solid waste compost site receives between 20,000 and 100,000 CY per year of lawn wastes only;
- A solid waste compost site receives less than 1,000 CY per year of material;
- A solid waste compost site receives between 20,000 and 100,000 CY per year of material that consists of lawn waste in combination with less than 1,000 CY of other materials; or
- A solid waste transfer station receives waste from vehicles other than those vehicles designed to compact solid waste.

The final partial exemption on this list is the reason none of the transfer stations in the Planning Area are required to have an NDEQ issued permit. Currently, there are regulations and licensing requirements within the Lincoln Municipal Code (LMC) related to "Recycling Processing Centers" which includes "*any premises that is maintained, used, or operated wholly or partially for recycling any recyclables that originated off the premises where the recycling occurs. Such recycling may include mechanical equipment for separating or modifying recyclable materials. Such modifying shall be limited to cutting, crushing, breaking, baling, and shredding. Recycling Processing Center includes both profit and not for profit operations.*" LMC also outlines operating requirements for salvage yards, recycling centers, recycling drop-off locations and commercial composting operations. LMC does not contain regulations on transfer stations. None of the state or local regulations requires transfer stations or processing facilities to report tonnages handled or information on type, source or destination of waste/materials received.

While transfer stations are often discussed in the context of saving money through reduced transportation cost, transfer stations are commonly developed to satisfy several purposes, not all of which are cost savings, including the following:

- Control expenses;
- Mitigate traffic at another site;
- Control the flow of waste;
- Provide user convenience (public cost savings);
- Screen waste;
- Facilitate recycling;
- Improve the control of illegal dumping;
- Help reduce air emissions; and,
- Strategically control future waste management.

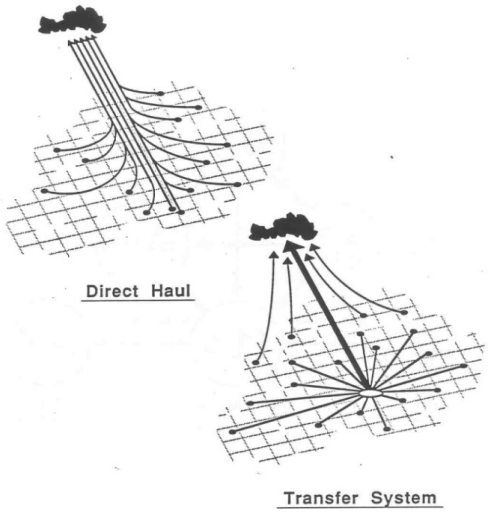

Figure 1 – Transfer Station Concept

As illustrated in Figure 1, cost savings or economic feasibility are often presented in terms of a break-even distance or cost, as a means to contrast direct (or primary) haul with secondary haul (via a transfer station).

Transfer stations and processing facilities can also be combined to provide for efficient transportation and handling of solid waste, recovered materials, processed recyclables, compostable materials, and compost products. They can also be combined operationally to share staff, equipment, building space and to allow materials delivered to a transfer station as waste to be diverted from disposal.

Nebraska's Integrated Solid Waste Management Act (Nebraska Revised Statutes Section 13-2001 to 2043) Part ***13-2023 - County, municipality, or agency; regulations authorized; limitations; noncompliance fee*** states:

> *"A county, municipality, or agency may, by ordinance or resolution, adopt regulations governing collection, source separation, storage, transportation, transfer, processing,*

treatment, and disposal of solid waste within its solid waste jurisdiction area as necessary to protect the public health and welfare and the environment."

The LPlan 2040 also says, relative to the City's existing North 48th Street Construction and Demolition Waste Landfill that "*while this landfill should be completed and closed, the N 48th Street transfer station and recycling areas are scheduled to remain*."

If a permanent household hazardous waste (HHW) facility were to be constructed it would also be anticipated to fall under the definition of a solid waste processing facility. The concept of a permanent HHW facility is discussed in the technical paper on Household Hazardous & Conditionally-Exempt Small Quantity Generator (Small Business) Hazardous Waste; as such, no further discussion of such a facility as a processing facility is included in this technical paper.

Current Programs

A recent Directory of Waste Processing & Disposal Sites 2012 by the Waste Business Journal suggests that there are approximately 3,300 transfer stations and over 1,500 material recovery facilities nationwide.

Solid waste processing facilities in Lancaster County include transfer stations, material recovery facilities (recycling processing centers), recycling centers and composting operations. Collected and transported materials are directed to these various waste handling and management facilities based on convenience, cost, vehicle size and material characteristics.

As further described in the Needs Assessment (2012), there are four transfer stations operating within Lancaster County. Based on the exceptions listed above, none of these facilities require a permit under NDEQ or LMC regulations.

North 48th Street Transfer Station - The City's small vehicle transfer station is located at 5101 North 48th Street and is used by cars, pickups, trailers, and other small vehicles that have specified maximum cargo box dimensions. Based on City records, this facility accepted an average of approximately 7,800 tons per year of solid waste over the last five years. This facility also accepts and manages lawn waste, brush, appliances, metals and tires that are sorted out and placed in designated storage areas on the site for additional processing or recycling. Waste oil and lead-acid batteries are also accepted for recycling at this facility. The number of vehicles using the transfer station has averaged approximately 25,000 vehicles per year over the past 5 years.

Bennet Refuse Transfer Station - The Village of Bennet operates a transfer station that serves community residents and area farmers that pay an annual permit fee to use the facility. The Village also operates a lawn waste and brush drop-off area at the transfer station. The transfer station site also serves as a multi-material drop-off site for recyclables.

Davey Refuse Transfer Station - The Village of Davey operates a transfer station that serves community residents and area farmers that pay an annual permit fee to use the facility. The transfer station site also serves as a multi-material drop-off site for recyclables as well as for brush and lawn waste.

Panama Transfer Station - The Village of Panama operates a transfer station that serves residents and area farmers that pay an annual permit fee to use the facility. The Village also operates a lawn waste and brush drop-off area at its transfer station. The transfer station site also serves as a multi-material drop-off site for recyclables.

For the convenience of citizens, the City operates a network of 29 multi-material recycling (drop-off) centers and 4 newspaper-only recycling (drop-off) centers in the Planning Area; most are open 24-hours per day. Two private recycling processing centers also operate multi-material recycling drop-off sites in the City. One village, (Hallam), operates its own recycling drop-off site. All total there are 36 drop-off sites; 27 are located in the City, and nine of these are in areas of the County outside of the City. The City contracts with a private hauler to collect and deliver the deposited materials from these recycling centers to a recycling processing center.

There are eight private buyback center locations in the City for metal cans and scrap metal; two of the centers only accept metal cans. Two private firms have facilities located in the Planning Area, and handle (process) large volumes of scrap from the Planning Area, including automobile and demolition scrap metals.

Three private materials recovery facilities (recycling processing centers) operate in the City. They accept recyclables from residential and business customers, and sort and process them to meet market specifications. All the facilities have warehouses, which are used for sorting and baling recyclables. These facilities process a wide variety of paper, plastics and metals for shipment to various markets and may offer recycling for a large part of eastern Nebraska and western Iowa. Some businesses that generate large quantities of cardboard ship it directly to processing facilities outside the Planning Area.

Generation and Diversion

Based on City records, the North 48th Street Transfer Station accepted an average of approximately 7,800 tons per year (approximately 20 to 25 tons per day) of solid waste over the last five years. The number of vehicles using the transfer station has averaged approximately 25,000 vehicles per year (approximately 75 per day) over the past 5 years. As such, the transfer station also serves a number of the purposes stated above, including the following:

- Mitigate traffic at another site (specifically the Bluff Road Landfill);
- Provide user convenience (public cost savings);
- Screen waste;
- Facilitate recycling;
- Improve the control of illegal dumping; and,
- Strategically control future waste management.

No data was available to quantify the tonnage or traffic handled at the other three rural transfer stations in the County.

Since FY1990-1991, the recycling centers managed by the City have collected 114,163 tons of recyclables. Table 1 shows the breakdown by material type and total tonnages of materials collected at recycling centers over the past 11 years.

Table 1 –Tons of Materials Recycled at Public Drop-off Sites

F.Y.	Newsprint	Containers				Paperboard	Mixed	Total
		Aluminum	PET & HDPE	Glass	Metals	& OCC	Paper	Tons
00-01	3,317	27	178	577	117	732	1,239	6,187
01-02	3,222	25	176	569	118	696	1,236	6,042
02-03	3,219	32	190	594	133	738	1,349	6,255
03-04	3,154	35	200	613	123	739	1,436	6,300
04-05	3,161	36	230	628	126	865	1,511	6,557
05-06	3,162	39	228	675	129	875	1,573	6,681
06-07	3,210	43	281	726	122	966	1,727	7,075
07-08	3,101	51	336	853	127	1,138	1,831	7,437
08-09	2,474	64	396	928	125	1,180	1,641	6,808
09-10	2,155	68	413	978	128	1,210	1,449	6,401
10-11	1,932	59	392	940	120	1,209	1,370	6,022

An annual City survey of recyclers provides some data on the quantity of residential and commercial recyclables handled by private-sector recyclers and processing facilities. Table 2 summarizes the reported data since 2000 for various recycled materials (excluding quantities in Table 1, which are also processed at these same facilities). The quantities originally reported by these processing facilities included metals associated with auto scrap, as well as salvage and demolition activities; quantities of metals in Table 2 were adjusted in an effort to reflect only metals from commercial and residential recycling activities. The quantities in Table 2 exclude materials such as tires, oil, wood pallets, electronics and other miscellaneous materials. The totals in Table 2 also exclude recycled concrete and asphalt materials (construction and demolition waste recycling).

Table 2 – Tons of Materials Recycled (Reported by Private-Sector)

Calendar Year	Metals [1]	Papers	Cardboard	Glass	Plastics	Totals
2000	5,967	10,095	12,412	1,899	92	30,465
2001	3,205	9,891	11,260	2,931	74	27,361
2002	5,623	11,343	13,690	2,665	281	33,603
2003	5,188	18,937	11,495	1,633	513	37,766
2004	7,962	14,108	14,464	1,702	276	38,512
2005	9,505	20,277	13,098	1,183	342	44,405
2006	7,434	12,262	20,931	1,696	461	42,784
2007	7,777	16,962	21,673	1,542	399	48,353
2008	9,716	9,227	14,317	316	449	34,025
2009	7,247	9,638	16,017	327	618	33,847
2010	9,815	14,252	16,750	1,874	1,308	43,999
2011	9,710	14,020	17,298	834	1,249	43,111

Notes:

(1) Actual quantities of reported ferrous metals have been adjusted to reflect 3 percent of the waste stream to correspond to the percentages of metals in NDEQ statewide waste composition study. Adjustments were made because the values reported to the City include items such as scrap automobiles and metals from salvage and demolition operations.

The average amount of materials reported to be managed, for recycling, by these private sector processing facilities since 2000 has been approximately 38,000 tons per year. These quantities have not been verified and it is not known what amounts come from subscription recycling service, buybacks, or other internal corporate recycling programs. Quantities of recyclables imported to these facilities are also unknown.

Program (Facility/System) Options

While this document presents economic and non-economic considerations, general approaches to evaluation, and rules-of thumb guidance in decision making related to transfer station it is not intended to be a substitute for a more formal feasibility evaluation. The outline of variables related to transfer stations presented in this document could serve as the basis for a site specific and more refined analysis of need and feasibility. Additionally, until further decisions are made relative to potential expansion of existing recycling programs it is not possible to fully address the need for additional or expanded processing facilities (material recovery facilities and recycling centers). Key options discussed in this technical paper include:

- Additional Transfer Station(s)
- Processing Capacity (to Meet Future Program Needs)
- Co-Located Facility(s)

For purposes of this technical paper, the flow of waste to a transfer station or processing facility is anticipated to occur principally through pricing structures as opposed to contracts, licensing requirements, mandates or other flow control mechanisms.

Transfer Station(s)

Beyond the City's current small vehicle transfer station at the North 48th Street site it is conceivable that an additional transfer station(s) could be constructed in the Planning Area for any of the purposes listed above, including economic benefits and cost savings. The cost savings typically associated with transfer stations are a result of combining the loads of several individual waste collection trucks into a single shipment thus saving labor and fuel and allowing collection vehicles to more quickly return to collection routes.

In USEPA's Waste Transfer Stations: A Manual for Decision-Making (EPA530-D-01-005 (Draft, February 2001)) it states "*Although cost-effectiveness will vary, transfer stations generally become economically viable when the hauling distance to the disposal facility is greater than 15 to 20 miles.*" Other publications might suggest that economic feasibility starts at one-way haul distances closer to 20 to 30 miles. These rule-of-thumb conclusions are obviously sensitive to a large number of assumptions, particularly haul distance, travel speed and time, payloads, the physical features and operating practices of a particular transfer station, and efficient equipment utilization.

As noted under the discussion of greenhouse gases (GHG) in the Needs Assessment (2012), the distance from the Bluff Road Landfill to the geographic center of the City is approximately 24 miles. Using either of the two rules-of-thumb distances (above) and the distance to the geographic center of the city would suggest that a transfer station located in the southern third of the City could under favorable economic conditions attract somewhere between one-quarter and one-half of the waste generated in the Planning Area. Such a

facility could also be located to correspond to the tiered growth pattern in the LPlan 2040 that is forecasted to be mostly to the south and east in the near term.

Using the average daily tonnage delivered to the Bluff Road Landfill, the concept of a transfer station accepting one-quarter to one-half of the waste tonnage would be equivalent to a transfer station sized to handle 200 to 400 tons per day, at current generation rates. This compares with the approximately 20 to 25 tons per day currently being handled at the North 48th Street Transfer Station; it is important to note that commercial refuse trucks are not allowed to use the North 48th Street Transfer Station.

As basis for further considerations the following is a summary of key issues that would need to be addressed in design and implementation of a new transfer station(s). A further breakdown of topics under each of these issues is included in Appendix 1.

- Users and Vehicles
- Wastes Handling
- Traffic Patterns
- Site
- Funding
- Schedule
- Capacity
- Technology
- Payloads
- Equipment
- Maintenance
- Personnel
- Operations
- Building and Safety Codes
- Environmental Concerns
- Support Facilities
- Construction

Before multi-million dollar commitments are made to construct and operatea transfer station, it is may be appropriate to perform a detailed analysis to confirm such rules-of-thumbs and provide support to questions which will be raised in the siting process and the political, social and possibly regulatory approval processes.

Processing Capacity

While NDEQ defines solid waste processing facilities in very broad terms, this technical paper focuses principally on **material recovery facilities** and **recycling centers**, as defined above. Material recovery facilities (MRFs -pronounced "murfs") sort recyclable materials to market specifications and then process them via shredding, crushing, and compaction (baling) techniques for shipment to appropriate secondary processors, end-users or markets. MRFs are generally described in the solid waste industry as either “Clean-MRFs” or “Dirty-MRFs”.

The term “Dirty-MRF” is used to describe a facility that processes raw waste or waste with high concentrations of recyclables with the intent of separating the recyclables from the waste. Such processing may involve varying degrees of mechanical separations such as screens and magnets, but often relies heavily on sorting by humans. Typically the more mechanized the system the lower the recovery rate for recyclables (on the basis of tons potentially recovered versus actually recovered). The original argument for Dirty-MRFs is that it allowed all potentially recoverable materials in the waste stream to be captured. Dirty-MRFs were widely touted in the early late 1980’s and early 1990’s but have generally declined in use due to several factors including: cost of construction, cost of operation, level

of recovery (post-disposal), difficulty in siting, and health and safety considerations for workers. One of the three processing facilities in Lincoln recently began sorting recyclables from select loads of (post disposal) waste from outdoor events and could be considered a form of a Dirty-MRF.

The term "Clean-MRF" is used to describe a facility that processes mixed or commingled recyclable materials collected from residences or commercial operations. Clean-MRFs handle recyclables which often contain less than 10 percent contaminants (waste materials). Clean-MRFs also rely on both mechanical and manual separation techniques, but are considered more efficient (than Dirty-MRFs) because they cost less to construct, cost less on a dollar per ton basis to operate, may be easier to site, and potentially pose less health and safety concerns for workers.

As discussed further in the technical papers on Residential Recycling and Diversion and Commercial Recycling and Diversion, the two most common forms of recyclables collection are single stream and dual (or multi-) stream. In the dual (or multi-) stream concept the resident separates materials into categories such as paper and containers, or by most distinct categories (e.g., paper would be separated by old newspaper (ONP), mixed paper, old corrugated containers (OCC), etc.); the goal of such programs is to reduce post collection processing costs and possible cross-contamination. In single stream programs all acceptable recyclable materials are placed in a common container(s) and sorted at a remote processing center. Single stream programs are often advocated because of ease and efficiency of collection, but are questioned in terms of optimum diversion because of potential for cross-contamination. Currently, there does appear to be a national trend toward more single stream programs.

Recycling centers can be staffed or un-staffed; however, staffing significantly increases costs – most drop-off sites in the US, including those in the Planning Area, are un-staffed. A key issue with recycling drop-off sites is the quality of materials deposited; the greater the failure to comply with establish program requirements the higher the cost, both in terms of contaminants and processing.

Waste exchanges and targeted materials programs are a form of recycling centers that generally focus on non-traditional materials that are more difficult to collect and/or recycle. Keep Nebraska Beautiful currently operates the Nebraska Materials Exchange Program, which focuses more on schools and businesses than at the residential services. Expanding material reuse centers/waste exchanges (public/private partnerships) have generally been discussed in technical papers related to Source Reduction. Facilities that target and process hard-to-recycle items, such as books, textiles, shoes, cooking oil, etc., are an advanced component of diversion programs. Targeting greater diversion of foods and fibers (i.e., organics) is further described and evaluated in the Organics Waste Diversion (Composting) paper.

As noted in technical papers related to recycling and composting, the capacity of existing facilities to process significantly larger volumes of materials would need to be evaluated if a significant increase of recyclables resulted from an expanded recycling program(s). Additionally, not all existing facilities may benefit from an expanded program.

Co-Located Facility(s)

Conceptually, co-locating a processing facility(s) with a transfer station is an option that could further enhance the recycling opportunities, increase tonnage diversion, and provide customers a one-stop site for most of their solid waste management needs. Conceptually, it can provide shared benefits including storage and transfer of commingled recyclables, select processing of concentrated loads of commercial waste, and an optional location(s) for citizen recyclables drop-off area. From a facility size perspective a shared/co-located facility can help to mitigate some traffic and unloading requirements thus reduce the overall processing facility and transfer station size requirements. Many transfer stations, similar to the City's North 48th Street Transfer Station include some processing and diversion opportunities, but not necessarily all of the attributes of a MRF-type facility.

If it were determined that an additional transfer station was needed or justified and additional processing capacity were required there are additional matters that would need to be addressed before a co-located facility(s) could be considered. Among the added considerations are:

- Ownership and operation
- Siting
- Funding
- User costs and inducements
- Synergy with landfill and other waste collection and diversion programs
- Other implementation issues

Any options for a co-located facility would need to consider the guiding principle identified in the LPlan2040, which states: "The City policy of privately owned and operated collection of refuse and recyclables coupled with public ownership, operation and financing of disposal and selected integrated solid waste management services will continue during the planning period." As facilities currently exist in the Planning Area, the City owns and operates the North 48th Street Transfer Station (and ancillary diversion programs) and private industry has taken on the role of ownership and operation of the recyclables processing facilities.

Options Evaluation

There are a wide array of issue and options associated with solid waste transfer station(s), processing facility(s) or co-located facilities. It is not always possible to compare each option to the other. Consistent with the evaluation criteria developed for use in the Solid Waste Plan 2040, the transfer station and processing facility options have been further evaluated based on the considerations shown in the following table.

Options related to the status quo are not further evaluated in this table. As noted above, the capacity of existing facilities to process significantly larger volumes of materials would need to be evaluated if a significant increase of recyclables resulted from an expanded recycling program(s). Additional discussion related to the various options may also be included in other technical papers, including those of Markets (for recyclable materials) and Funding Options. Key issues that will need to be addressed with any of the options include the following:

- Need for such a facility (economic or other justification)
- Ownership and operation (including consideration of LPlan 2040 Guiding Principles)
- Siting (opposition to siting)
- Funding
- User costs and inducements (including incentives and market implications for recovered materials)
- Synergy with landfill and other waste collection and diversion programs
- Other implementation issues

The Solid Waste Plan 2040 may also consider the need to implement a transfer station(s) and processing facility(s) to capture and utilize the value of solid waste, to provide an integrated resource conservation and management system, and to ensure safe, sound, environmentally responsible waste management practices. Additional evaluation criteria may include the reduction in GHG and other air emissions and cost effectively transporting waste and materials generated and managed within the Planning Area.

Evaluation Criteria	Transfer Station(s)	Processing Facility Capacity	Co-Located Facilities
Waste Reduction/ Diversion	Transfer stations are not waste reduction/diversion facilities but provisions for reduction and diversion can be included or integrated into such facilities which can contribute toward source reduction and/or recycling/diversion goals. Transfer stations can help minimize waste exports or can be used as a mechanism to transport material to more distant disposal sites. They do not minimize a community's dependence on landfills.	Adequate processing facility capacity is necessary to ensure that collected recyclables are diverted from disposal. The methods and techniques used at a processing facility must be configured to maximize the marketing of recovered materials, by proper processing and preparation of materials to meet market specifications. Processing facilities help minimize dependence on landfilling and contribute to recycling/diversion goals by maximizing recyclables diversion.	Co-locating a transfer station and processing facility can create additional opportunities for waste recycling and landfill diversion by allowing an additional opportunity to capture recyclables that may be delivered in the waste stream and as such can help contribute toward source reduction and/or recycling/diversion goals. Co-locating can help minimize waste exports or can be used as a mechanism to efficiently transport material to more distant disposal sites and markets. Transfer stations can help minimize waste exports or can be used as a mechanism to transport material to more distant disposal sites. They do not minimize a community's dependence on landfills.
Technical Requirements	Transfer stations should be compatible with other program elements provided they are used to effectively manage waste and achieve the objectives of the Solid Waste Plan 2040. The level of risk associated with transfer stations is relatively low provided the economic evaluation and siting consider the needs of the waste collection community. Some risk for opposition exists with siting of any new solid waste management facility. Transfer stations are a reliable and proven technique for traffic mitigation, cost savings, and emissions reduction. Properly configured, transfer stations also provide for flexibility in the overall operations of solid waste program.	The capacity of existing processing facilities to process significantly larger volumes of materials would need to be evaluated if a significant increase of recyclables resulted from an expanded recycling program(s). Material recovery facilities and recycling centers are considered compatible with other program elements and represent a low level of risk and uncertainty. It is unclear how an expanded recycling program will affect existing material recovery facilities and recycling drop-off sites. Material recovery facilities and recycling centers are generally considered highly reliable and contain the necessary level of redundancy and redundancy to respond to market needs.	Co-located facilities could be used to meet any short-falls in existing capacity requirements. While issues of ownership, operation, user fees, and similar matters would need to be addressed, co-located transfer station and processing facility functions are theoretically compatible with other program elements and would provide program flexibility, redundancy and manageable levels of risk.
Environmental Impact	Transfer stations can help conserve energy resources by reducing fuel consumption associated with transporting waste from collection routes to solid waste management facilities; this also reduces air emissions. By using a transfer station for waste screening it can reduce toxicity of waste delivered to the landfill. Transfer stations typically provide safer unloading operations than do landfills because all waste is unloaded inside of a building and typically on a concrete floor.	Processing facilities are used to process recyclables and as such conserve both material and energy resources.	Co-located facilities, if appropriate, would help conserve resources (material and energy) by reducing transportation costs and could potentially be used to increase resource conservation by increasing material recycling; this also reduces air emissions. By using a transfer stations for waste screening it can reduce toxicity of waste delivered to the landfill. Transfer stations typically provide safer unloading operations than do landfills because all waste is unloaded inside of a building and typically on a concrete floor.

Evaluation Criteria	Transfer Station(s)	Processing Facility Capacity	Co-Located Facilities
Economics	Transfer station(s) will require a significant capital investment for the siting, design, permitting, and construction. These costs would generally be recovered though user fees. If feasible from strictly a cost savings perspective it should not represent an increased cost to residents or business. There are a variety of mechanisms that could be used to fund such a facility including revenue bonds and others as more fully discussed in the technical paper on Funding. Transfer stations are not considered as a tool for economic development, but to the extent that they keep solid waste management fees low they may be viewed as supporting economic development opportunities.	Increasing processing facility capacity, if required, would likely involve a significant capital investment for the siting, design, permitting, and construction. These costs would generally be recovered though charges for material processing and through revenues from the sale of recovered materials. It is unclear whether increasing processing facility capacity (if required) would represent an increased cost to residents or business. There are a variety of mechanisms that could be used to fund such a facility. Based on historic practices it is assumed that funding would be by private industry. See the technical paper on Funding for discussion of other funding options, which are more generally applicable to governmental funding. Processing facility(s) and processing capacity are not considered as a tool for economic development.	Co-located facilities will require a significant capital investment for the siting, design, permitting, and construction. These costs would generally be recovered through a variety of mechanisms including user fees, processing fees and revenues from the sale of recovered materials. If a transfer station(s) is feasible from strictly a cost savings perspective it should not represent an increased cost to residents or business. It is unclear whether increasing processing facility capacity (if required) would represent an increased cost to residents or business. There are a variety of mechanisms that could be used to fund such a facility. See the technical paper on Funding for discussion of funding options. A key issue in funding will be ownership of the facility. A co-located transfer station(s) and processing facility are not considered as a tool for economic development.
Implementation Viability	Implementation of a transfer station(s) will not require legislative or regulatory changes, but will require permitting and approvals. Implementing a facility(s) will likely require land acquisition and may involve a siting process. The potential exists for the siting of such a facility to face social/political acceptability challenges. Factors related to schedule would need to be addressed as part of a feasibility analysis and with consideration of the siting and permitting process.	Implementation of additional processing capacity, if required, will not require legislative or regulatory changes, but may require permitting and approvals. Implementing a new facility(s) will likely require land acquisition and may involve a siting process. The potential exists for the siting of such a facility to face social/political acceptability challenges. Challenges may not be significant for a clean-MRF; these challenges may be more significant for a dirty-MRF. Factors related to schedule would need to be addressed as part of the determination of the needs for a new facility and with consideration of the siting and permitting process.	Implementation of co-located facilities will not require legislative or regulatory changes, but will require permitting and approvals. Implementing such a facility will likely require land acquisition and may involve a siting process. The potential exists for the siting of such a facility to face social/political acceptability challenges, particularly aspects involving waste handling. Factors related to schedule would need to be addressed as part of a feasibility analysis and with consideration of the siting and permitting process.

Relationship to Guiding Principles and Goals

As it relates to the Guiding Principles and Goals of the Solid Waste Plan 2040, the existing transfer station and processing facilities, as well as potential additional facility(s) would be applicable as further noted below:

- **Emphasize the waste management hierarchy**: Both transfer station(s) and processing facilities can help process waste and materials to recover commercially viable material for making new products. Transfer stations can also be used to effectively manage residuals (waste) in an environmentally sound manner.
- **Encourage public/private partnerships**: Currently the City's role in providing the existing transfer station and private industry's role in providing processing facilities is also reflected in the guiding principles in the LPlan 2040 which states "*The City policy of privately owned and operated collection of refuse and recyclables coupled with public ownership, operation and financing of disposal … will continue during the planning period*." The City's role in providing multi-material recycling drop-off sites was a outcome of the previous planning process.
- **Ensure system capacity**: Additional transfer station(s) may be appropriate to keep MSW transportation costs low as the City grows to the south and east. A transfer station(s) can also be used to control the flow of waste within the Planning Area to ensure effective utilization of existing disposal capacity. Available processing capacity may need to be evaluated as part of any program that significantly expands recycling diversion rates (residential or commercial) to determine the need for additional processing capacity and facilities. It may be appropriate to further evaluate the need for additional transfer station(s) to reduce air emissions, cost-effectively transport materials generated and managed within the Planning Area and as part of an enhancement of current diversion programs.
- **Engage the community:** Public education to engage the community will be important to sustaining existing diversion programs and to implement any new management facilities. Any effort to implement a new transfer station(s) and possibly co-located or added processing facilities will create additional opportunities for public comment. In terms of siting and obtaining approval of a transfer station(s) an informed public will be important to understanding why approval of such a facility is necessary. Stakeholder input may also be necessary in the siting and design configuration of a new waste handling facility.
- **Embrace sustainable principles:** It is anticipated that any new waste transfer or processing facilities will need to consider economic, environmental, social, technological and political factors. Systems that contribute to maximizing waste reduction and materials recovery, reduce fuel consumption, reduce air emissions and help maintain low costs solid waste services are considered to be consistent with sustainable principles.

Summary

Both transfer stations and processing facilities fall under the NDEQ Title 132 definition of solid waste management facility, which includes both public and private facilities. Solid waste processing facilities currently in use in Lancaster County include transfer stations, material recovery facilities (recycling processing centers), recycling centers, drop-off sites and

composting operations. Collected and transported materials are directed to these various waste handling and management facilities based on convenience, cost, vehicle size and material characteristics. None of the state or local regulations requires transfer stations or processing facilities to report tonnages handled or information on type, source or destination of waste/materials received.

While transfer stations are often discussed in the context of saving money through reduced transportation costs, transfer stations are commonly developed to satisfy several purposes, not all of which are cost savings, including the following:

- Control expenses;
- Mitigate traffic at another site;
- Control the flow of waste;
- Provide user convenience (public cost savings);
- Screen waste;
- Facilitate recycling;
- Improve the control of illegal dumping;
- Help reduce air emissions; and,
- Strategically control future waste management.

Using general rules-of-thumb related to haul distances would suggest that a transfer station(s) located in the southern third of the City could under favorable economic conditions attract somewhere between one-quarter and one-half of the waste generated in the Planning Area. Such a facility could also be located to correspond to the tiered growth pattern in the LPlan 2040 that is forecasted to be mostly to the south and east in the near term. Before multi-million dollar commitments are made to construct and operate a transfer station, it is appropriate to perform a detailed analysis to confirm such rules-of-thumbs and provide support to questions which will be raised in the siting process and the political, social and possibly regulatory approval processes.

Additionally, until further decisions are made relative to potential expansion of existing recycling programs it is not possible to fully address the need for additional or expanded processing facilities (material recovery facilities and recycling centers).

Conceptually, co-locating a processing facility(s) with a transfer station is an option that could further enhance the recycling opportunities, increase tonnage diversion, and provide customers a one-stop site for most of their solid waste management needs. Transfer stations and processing facilities can also be combined to provide for efficient transportation and handling of solid waste, recovered materials, processed recyclables, compostable materials, and compost products. They can also be combined operationally to share staff, equipment, building space and to allow materials delivered to a transfer station as waste to be diverted from disposal.

Any options for a co-located facility would need to consider the fact that as facilities currently exist in the Planning Area, the City owns and operates the North 48th Street Transfer Station (and ancillary diversion programs) and private industry has taken on the role of ownership and operation of the recycling processing facilities.

MAKING THE RIGHT DECISIONS UP FRONT: A CHECKLIST FOR SUCCESSFUL PLANNING AND DESIGN OF TRANSFER FACILITIES

by

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MAKING THE RIGHT DECISIONS UP FRONT: A CHECKLIST FOR SUCCESSFUL PLANNING AND DESIGN OF TRANSFER FACILITIES

Design and Implementation - Expanded List

- Users and Vehicles
  - acceptable vehicles
  - vehicle volumes
  - vehicle types
  - weighing and recordkeeping requirements
  - fee assessment/billing requirements

- Wastes Handling
  - waste screening/acceptable waste
  - bulky waste, metals, small load handling requirements
  - recycling/waste sorting requirements
  - buyback and recyclables drop-off provisions
  - household hazardous provisions
  - other (e.g. compost)

- Traffic Patterns
  - queuing on-site/off-site - acceptable limits
  - interior/exterior maneuvering of waste vehicles
  - roadway geometrics (turning radii, lane widths)
  - traffic patterns/control signage (backing, crossing)

- Site
  - available land
  - site peculiarities
  - available utilities
  - drainage and erosion control
  - landscaping/visual screening/buffers
  - site security
  - public opinion
  - right-of-ways, easements

- Funding
  - available funds
  - procurement methods
  - procurement restrictions

- Schedule
  - implementation schedule (overall)
  - advertisement to award
  - seasonal restrictions
  - construction critical path
  - methods to accelerate
  - long lead items
  - code or review/approvals

- Capacity
  - waste storage capacity/method
  - waste throughput capacity (in and out)
  - technology constraints
  - transfer vehicle constraints

- Technology
  - operational simplicity
  - efficient operation/minimize staffing
  - weak link (mechanical/electrical)
  - loading and transfer equipment
  - redundancy/stand-by
  - open-top loading
  - compactors
  - balers
  - other techniques

- Payloads
  - optimizing payloads
  - legal roadway limits
  - load-out scales/in-place weighing

- Equipment
  - support equipment
  - transfer vehicle configuration
  - equipment compatibility
  - equipment procurement options

- Maintenance
  - site and facility maintenance
  - wear resistance
  - preventative maintenance
  - equipment maintenance

APPENDIX 1

- Personnel
  - parking employees/equipment
  - employee areas (showers, lockers, lunchrooms)
  - training, safety, and health
  - visitors

- Operations
  - design for continuous service
  - standard operating practices
  - hours of operation
  - interface with landfill or resource recovery facility
  - emergency operating procedures

- Building and Safety Codes
  - building codes and standards
  - zoning/permitting/environmental review
  - fire prevention and protection
  - user safety

- Environmental Concerns
  - dust and odor
  - noise
  - vehicle emissions
  - traffic
  - litter
  - rodents/vectors
  - wastewater
  - special wastes

- Support Facilities
  - equipment fueling, maintenance, washing
  - administrative areas
  - user convenience areas
  - storage
  - scales and scalehouses

- Construction
  - architectural aesthetics
  - local construction practices
  - materials of construction (non-combustible)
  - site security
  - testing and construction quality control