heffron transportation, inc.
Transportation Planning & Engineering Consulting Services

TRANSPORTATION TECHNICAL REPORT

SEATTLE PUBLIC UTILITIES

TRANSFER STATION IMPROVEMENT PROJECT

NORTH RECYCLING AND DISPOSAL STATION

Prepared for:

Seattle Public Utilities

MARCH 3, 2008

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Prepared by:

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1. INTRODUCTION

Seattle Public Utilities (SPU) manages the collection and transfer of Seattle's solid waste. SPU maintains several facilities to manage this waste including two transfer stations—North Recycling and Disposal Station (NRDS) and South Recycling and Disposal Station (SRDS), as shown in Figure 1. SPU also has two household hazardous waste facilities—one in North Seattle and one at SRDS.

This transportation technical report documents the transportation impacts associated with proposed improvements at the NRDS. The analysis determined the net change in passenger-vehicle and truck traffic at NRDS and how that change would affect traffic operations and on-site queuing. Transportation information was compiled for two levels of use—an average day and a peak design day—and three traffic scenarios. The traffic scenarios (high, medium, and low) were developed to represent a range of possible waste flows at NRDS.

2. PROJECT DESCRIPTION

NRDS is an aging transfer station (over 40 years old) that is in poor condition and suffers from frequent breakdowns that are likely to increase with time. Also, the facility lacks capacity to meet Seattle's future recycling and waste handling needs. In response to these issues, SPU proposes to construct a new transfer station building with new waste recovery facilities.

The proposed project includes demolishing the existing structures and building a new transfer station, recycling facilities, employee facilities, office, parking, and associated utility facilities. The existing site is proposed to be expanded by three actions:

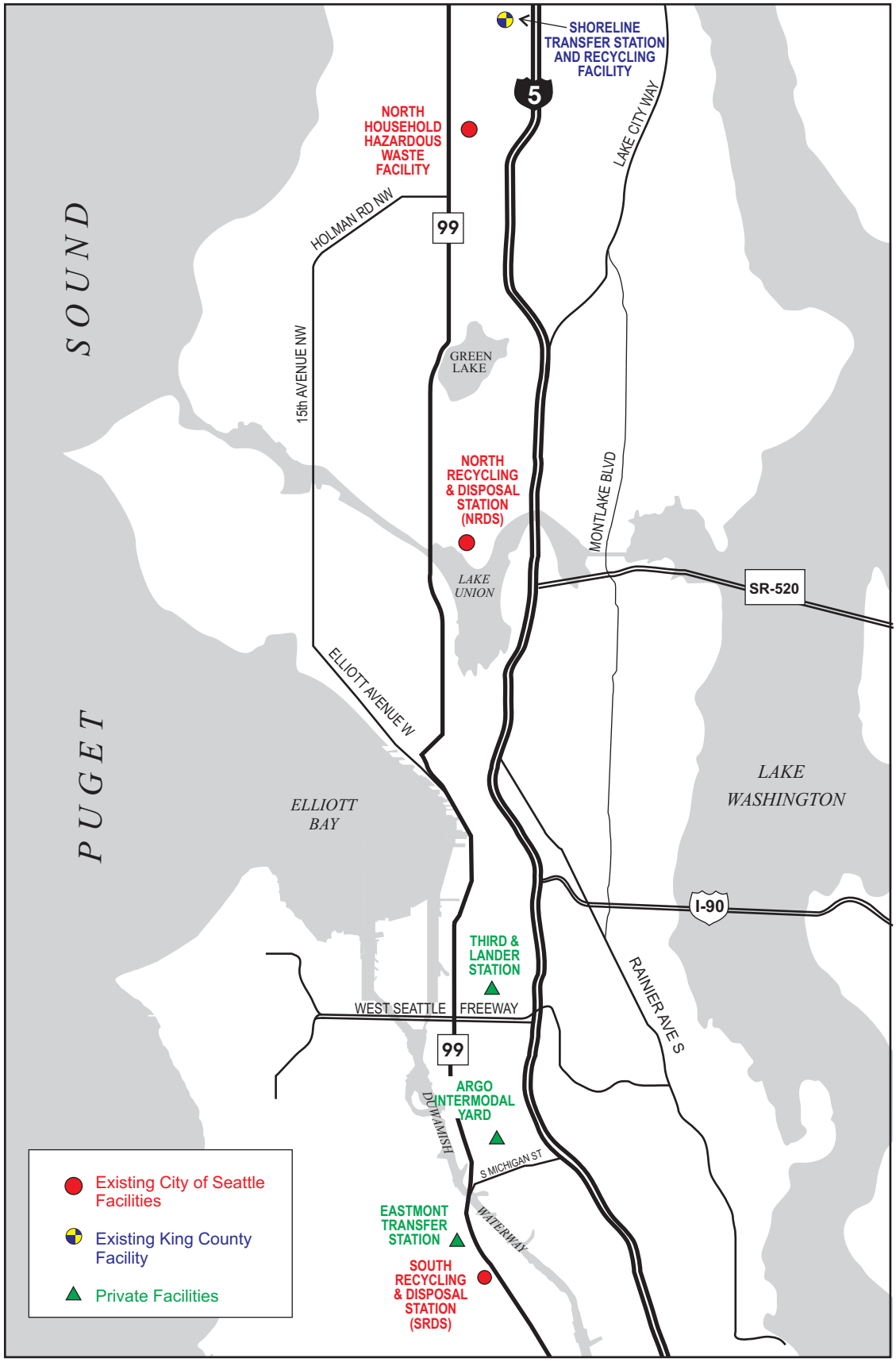
1. Vacating Carr Place N between N 34th Street and N 35th Street,

2. Adding the parcel to the east of NRDS bounded by Carr Place N, Woodlawn Avenue N, N 34th Street, and N 35th Street, and

3. Adding the existing parking lot located north of N 35th Street between Carr Place N and Woodlawn Avenue N for employee parking.

Figure 2 shows the location of the existing NRDS site, Carr Place N, the parcel to the east of NRDS, and the existing parking lot.

A new transfer building is proposed to be located on the existing NRDS site. Expanded scale facilities are proposed to be located along the main access driveway. Structures on the parcel east of NRDS would be demolished and new facilities would be constructed including a recycling drop-off area with recycling bins, offices, employee facilities, a meeting room, parking spaces, and other utility facilities. The existing parking lot located north of N 35th Street between Carr Place N and Woodlawn Avenue N would be used for NRDS employee parking. Primary access to the site would continue to occur on N 34th Street. A secondary access for transfer trailers would continue to be located on N 35th Street.



NOT TO SCALE

SPU TRANSFER STATION IMPROVEMENT PROJECT
North Recycle and Disposal Station

Figure 1

SPU SYSTEMWIDE MAP

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N

SPU TRANSFER STATION IMPROVEMENT PROJECT
North Recycle and Disposal Station

Figure 2

NRDS SITE MAP

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3. BACKGROUND CONDITIONS

This section of the report describes existing and year 2030 No-Action conditions. The No-Action condition is the future condition without the proposed changes in facilities or operations. These are the base conditions against which the impacts of the proposed project are evaluated.

3.1. Transportation Network

The existing NRDS is located in the Wallingford neighborhood of Seattle, north of Lake Union. The existing site is bounded by N 35th Street to the north, N 34th Street to the south, Woodlawn Avenue N to the west, and several businesses to the west. Key attributes of roadways located in the vicinity of this site are shown on Figure 3.

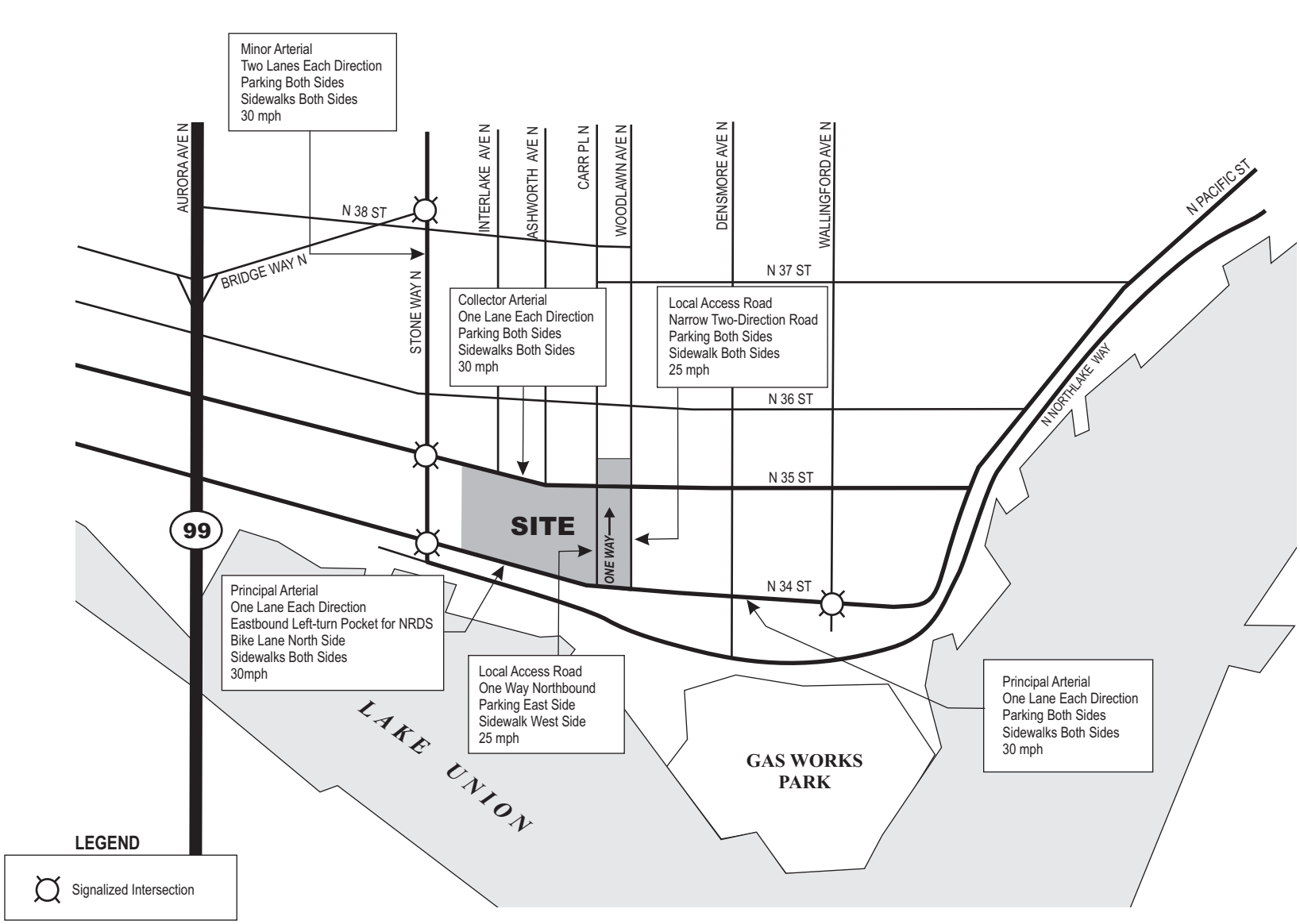
The City of Seattle's *2007 – 2012 Capital Improvement Program* was reviewed and there are no planned transportation projects that would change the roadway network in the project vicinity. Therefore, it was assumed that the roadway network for the future No-Action condition would be the same as the existing condition.

3.2. Traffic Volumes and Operations

Operations at the existing transfer station yard involve handling waste brought in by collection trucks and self-haul customers and then hauling the waste off site to various locations. The transfer station currently accepts residential and commercial waste from collection trucks and self-haul waste (e.g., waste brought in by private car or truck) including refuse, yard waste, and recyclables. Most of the waste brought in to NRDS is compacted and trucked off site in transfer trucks. Transfer trucks deliver municipal solid waste to the Argo train yard located in south Seattle and yard waste to processing facilities such as Cedar Grove Composting Facility. Recyclables are trucked off site to various locations throughout the region. The transfer station is currently open 362 days per year from 8:00 A.M. to 5:30 P.M.—it is closed New Year's Day, Thanksgiving, and Christmas. NRDS also closes at noon on July 4th because of the fireworks show at Gas Works Park.

A transportation model was developed to estimate existing and future daily and peak hour trips generated by the transfer station. The model was developed by Herrera Environmental Consultants and is based on tonnage and trip parameters provided by SPU. More information about the transportation model can be found in Appendix A. NRDS data for 2006 were used to estimate existing daily and peak hour trips generated by the transfer station. According to the model, NRDS generated about 1,100 vehicle trips on an average day and about 1,370 trips on an average day during a peak month in 2006. The modeled self-haul and collection truck volumes were compared to actual trip counts for those trip types at NRDS in 2006 and were found to be similar.

The transportation model also includes hourly flow data for vehicles arriving at NRDS in 2006. These are shown in Figure 4. In 2006, the overall peak hour of the day occurred between 2:00 and 3:00 P.M. when NRDS generated approximately 134 trips (67 trips in and 67 trips out) on an average day and 170 trips (85 trips in and 85 trips out) on a peak design day. Approximately 80% of the daily trips and peak hour trips were self-haul trips.



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North Recycle and Disposal Station

Figure 3

ROADWAY NETWORK NEAR NRDS

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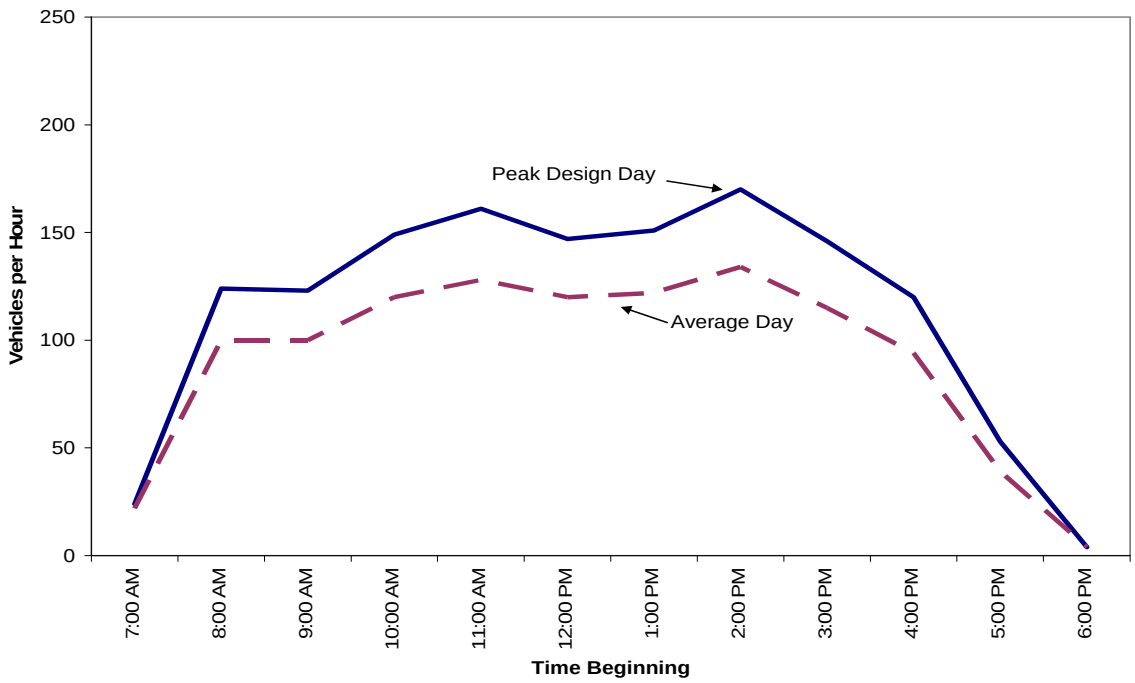
Figure 4. 2006 NRDS Site-Generated Trips



Source: Heffron Transportation, Inc. 2008 based on a transportation model developed by Herrera Environmental Consultants with data provided by SPU.

In 2030 with the No-Action condition, NRDS is expected to generate about 1,750 trips on an average day during the peak month assuming the high-traffic scenario as described later in Section 4.1. This represents about 1% annual growth for daily site-generated trips compared to trips generated in 2006. The overall peak hour of the day is anticipated to continue to occur between 2:00 and 3:00 P.M. when NRDS is projected to generate approximately 209 trips (104 trips in and 105 trips out) on a peak design day. This represents about 0.9% annual growth for the peak hour site-generated trips compared to trips generated in 2006. About 84% of the daily trips and about 87% of the peak hour trips are expected to be self-haul trips.

Recent traffic count data from Seattle Department of Transportation (SDOT) were reviewed on Stone Way N near the site. These data show the highest traffic volumes on the streets near NRDS occur on weekdays during the afternoon commute hours. A recent traffic count at N 34th Street/Stone Way N intersection shows the PM peak hour occurs between 4:45 and 5:45 P.M. Therefore, this weekday PM peak hour was used as the time period for all traffic operations analysis.

This analysis focuses on the impacts to the N 34th Street/Stone Way N intersection because it is the highest-volume intersection near the project site, and congestion at this intersection could affect operations at the main site access driveway. A recent PM peak hour turning movement count was obtained from SDOT at the N 34th Street/Stone Way N intersection. It was performed on Wednesday, October 31, 2007 when all travel lanes on the Fremont Bridge were re-opened after the recent construction project. Traffic volumes from that count are shown on Figure 5. Approximately 2,260 vehicles traveled through the N 34th Street/Stone Way N intersection during the PM peak hour in October 2007. A small fraction of this traffic is related to the NRDS, which generates less than four percent (4%) of its traffic during the commuter PM peak hour.

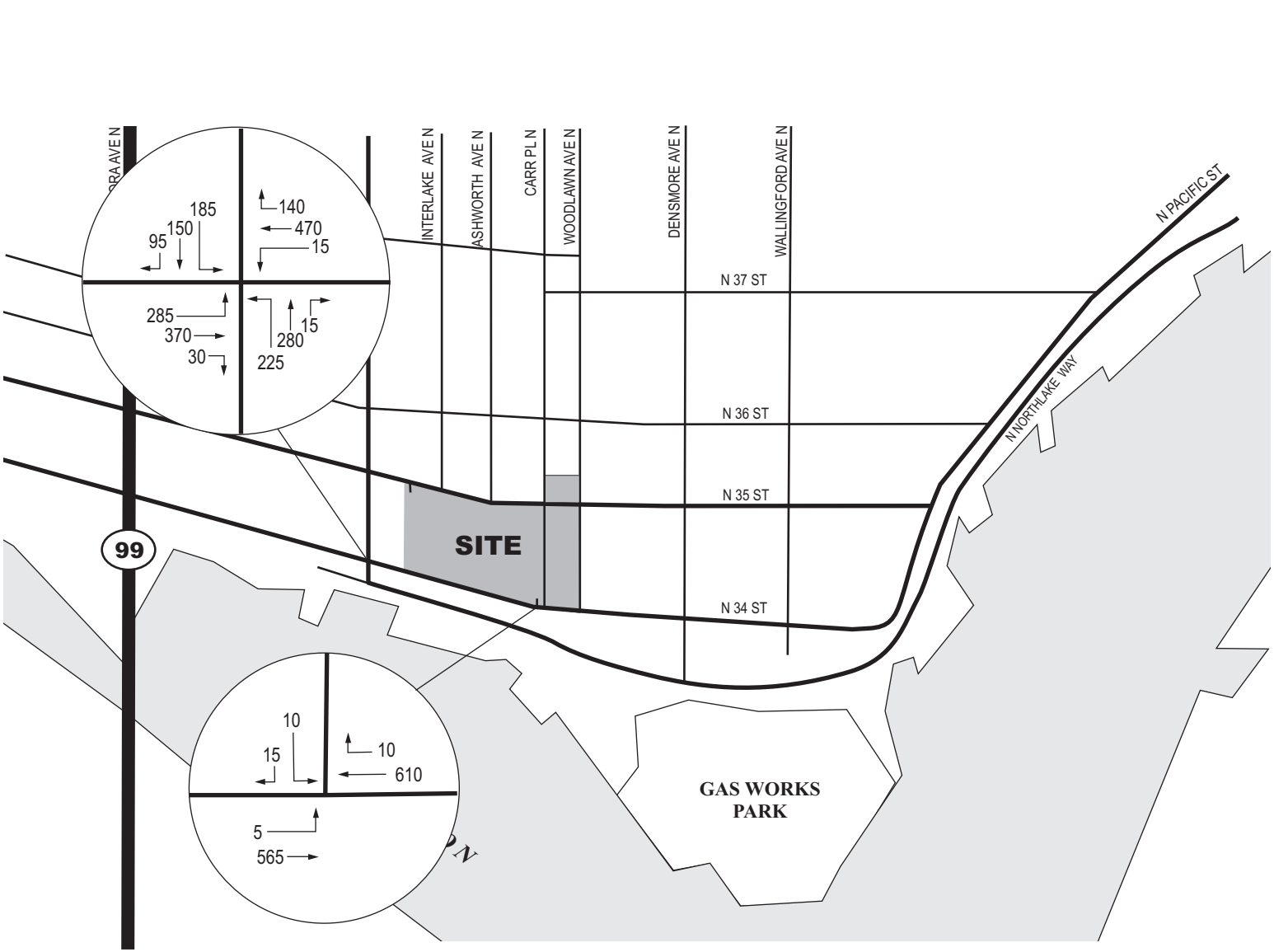


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Figure 5

EXISTING (2007) PM PEAK HOUR TRAFFIC VOLUMES

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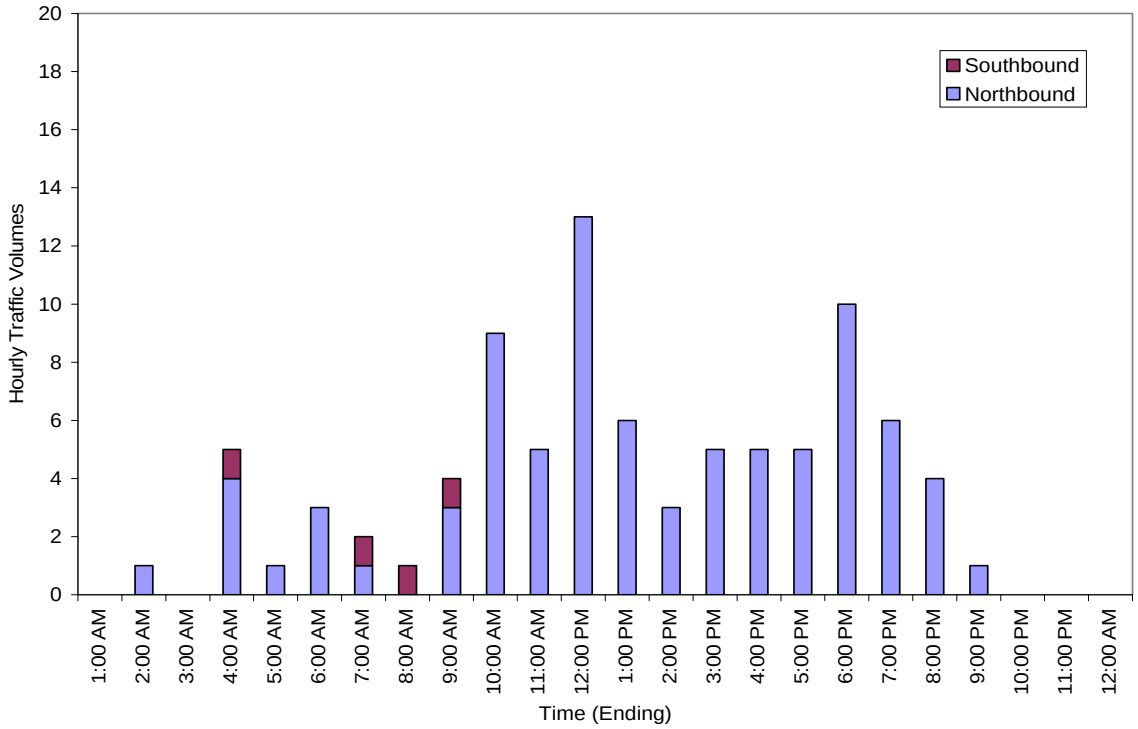
The project proposes to vacate Carr Place N to expand the site area. To assess the potential impact of this vacation, a 24-hour count was commissioned on Carr Place N between N 34th and 35th Streets on Tuesday, November 13, 2007 to determine the existing traffic volume on that roadway. The hourly traffic volumes are shown on Figure 6. There were approximately 90 vehicles that traveled on Carr Place N in a 24-hour period. Carr Place N is a northbound-only roadway; however, four vehicles were counted traveling southbound on this roadway in the early morning hours. The peak hourly volume of 13 vehicles occurred between 11:00 A.M. and noon, and five vehicles traveled on Carr Place N during the PM peak hour.

Figure 6. Traffic Volumes on Carr Place N – November 2007

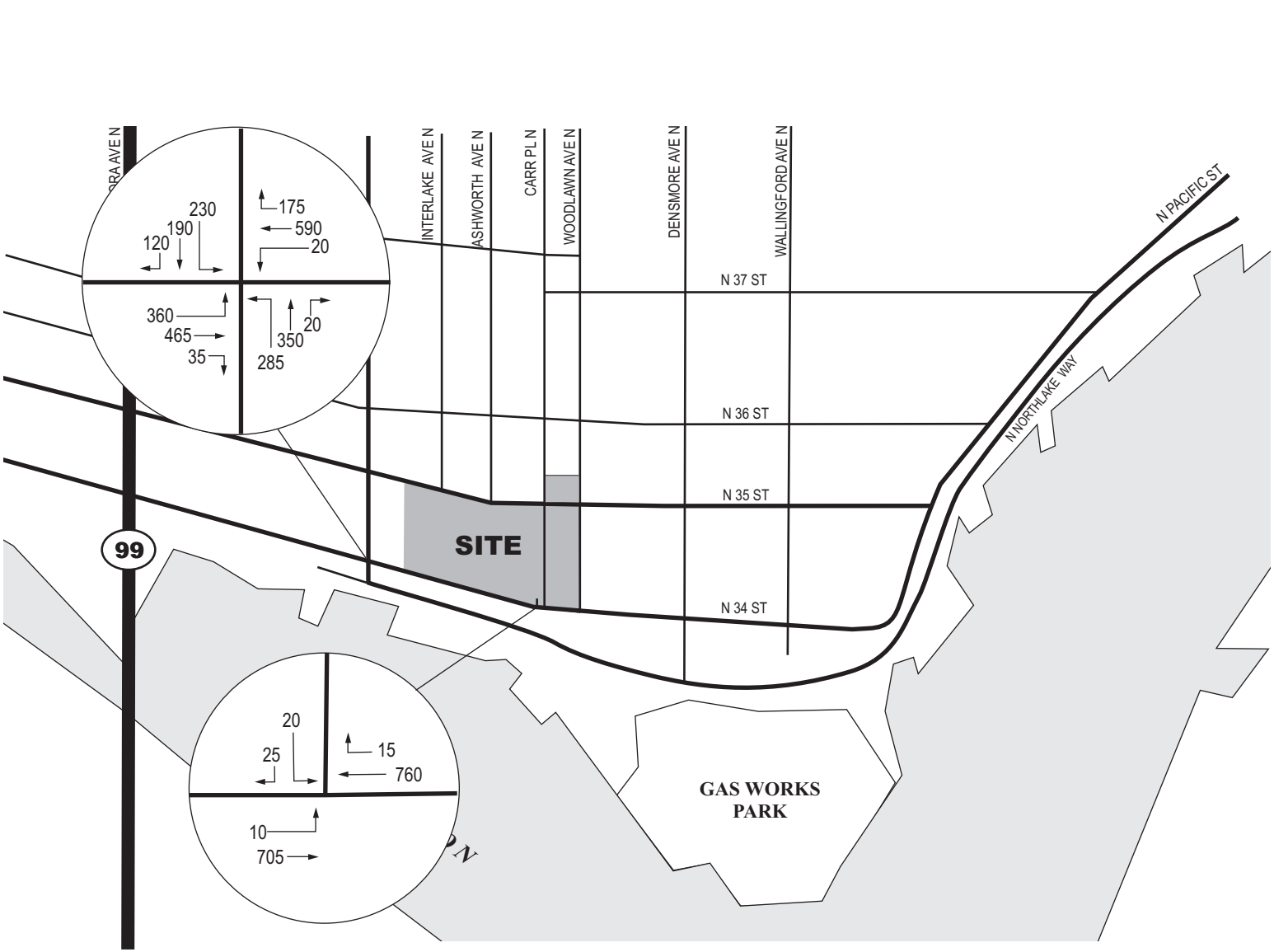


Source: Traffic Count Consultants, November 13, 2007. Note that Carr Place N is one-way in the northbound direction; however, some southbound vehicles were recorded during early morning hours.

Traffic operating conditions are characterized by "level of service (LOS)." Six letter designations, "A" through "F," are used to define level of service. LOS A is the best and represents good traffic operations with little or no delay to motorists. LOS F is the worst and indicates poor traffic operations with long delays. Levels of service were determined using the *Synchro 6.0* software and analysis methodology. The N 34th Street/Stone Way N intersection currently operates at LOS D during the PM peak hour.

Traffic volumes in the site vicinity are expected to grow in the future. 2030 background traffic volumes were estimated by applying a growth rate of 1% per year for 23 years to existing 2007 traffic volumes. This growth rate was approved by City of Seattle staff.[1] Year 2030 No-Action traffic volumes are shown on Figure 7.

[1] John Shaw, Transportation Planner, City of Seattle Department of Planning and Development, February 13, 2008.



SPU TRANSFER STATION IMPROVEMENT PROJECT
North Recycle and Disposal Station

Figure 7

2030 NO-ACTION PM PEAK HOUR TRAFFIC VOLUMES
HIGH-TRAFFIC SCENARIO

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The number of vehicles traveling through the N 34th Street/Stone Way N intersection in during the PM peak hour in 2030 with the No-Action condition is estimated to be approximately 2,840—an increase of about 580 vehicles during the PM peak hour compared to existing conditions. Assuming this rate of traffic growth, the N 34th Street/Stone Way N intersection is projected to operate at LOS F (an average of 90.1 seconds of delay per vehicle) during the PM peak hour in 2030 with the No-Action condition.

3.3. Site Access and Circulation

The main access to NRDS, located on N 34th Street, provides access for contractor and self-haul customers. A secondary driveway exists on N 35th Street that provides access for transfer trucks. Traffic volumes at the main access were obtained on Thursday, January 24, 2008 and are shown on Figure 5. All movements at the main NRDS driveway currently operate at LOS B or better during the PM peak hour.

2030 No-Action traffic volumes at the NRDS driveway were projected using the information described in Section 3.2, and are shown on Figure 7. All movements at the NRDS driveway are expected to continue to operate at LOS C or better in 2030 with the No-Action condition, assuming travel patterns similar to the existing condition.

SPU staff[2] described the existing queuing condition and indicated that insufficient capacity in the tipping building creates queues on a daily basis. Staff indicated that vehicle queues extend from the tipping building back to the inbound scale, which delays arriving vehicles. Queues extending from the inbound scale to N 34th Street and then to Woodlawn Avenue N are common on an average day. Some queuing in the left-turn lane on N 34th Street also occurs on an average day. On average days in a peak month, vehicle queues on N 34th Street can extend well past Densmore Avenue N. Some vehicles queue in the left-turn lane on N 34th Street, but because of the perception that this is cutting into the queue and the reluctance of other motorists to let them enter the queue at this location, most drivers join the end of the queue to the east on N 34th Street.

In 2030 with the No-Action condition, trips generated by NRDS are anticipated to increase compared to the existing condition. NRDS trip increases range from 14% to 29% depending on the traffic scenario. Because no improvements to NRDS would occur with the 2030 No-Action condition, queues are expected to be longer than currently experienced at NRDS. It is difficult to estimate the actual queue that would occur because future on-site operations (e.g., how tipping building stalls would be assigned) are unknown. If operations continue similar to the existing condition, queues could extend to Wallingford Avenue N and create traffic congestion through that intersection. It is possible that NRDS customers would make other decisions with the No-Action condition, such as coming to the site less frequently with larger loads, taking their waste elsewhere or possibly dumping waste illegally.

3.4. Traffic Safety

Collision data were obtained from the City of Seattle to determine if there are any traffic safety conditions that could impact or be impacted by the Proposed Actions. Signalized intersections with 10 or more collisions per year and unsignalized intersections with five or more collisions per year are considered high-collision locations by the City of Seattle. Three years of the most recent available data were obtained from the City, which include the period from January 1, 2005 through December 31, 2007. The collision data are summarized in Table 1.

[2] Henry Friedman, SPU Project Manager, February 14, 2008.

Table 1. Intersection Collision Summary – Near NRDS

Intersection / Roadway	Type of Collision (Totals for Three Years) Head -On	Rear-End	Side-Swp	Right Turn	Left Turn	Right Angle	Peds/ Cycl	Other	Total	Average per Year
Signalized										
N 34th St/Stone Way N	0	0	1	0	0	3	0	0	4	1.3
N 35th St/Stone Way N	0	0	0	0	4	8	1	0	13	4.3
Unsignalized										
N 34th St/Carr Place N	0	0	0	0	0	0	0	0	0	0.0
N 34th St/Woodlawn Ave N	0	0	0	0	0	0	0	0	0	0.0
N 35th St/Carr Place N	0	0	0	0	0	0	0	0	0	0.0
N 35th St/Woodlawn Ave N	0	0	0	0	0	1	0	0	1	0.3

Source: City of Seattle. Data were obtained for the period from 01/01/2005 through 12/31/2007 (a 3-year period).

None of the intersections currently meet the criteria of a high-collision location. Eight of the 13 collisions at the N 35th St/Stone Way N intersection were right-angle collisions, which can be related to motorists running red lights. However, the number of collisions at this location has decreased in recent years. Previous analysis of this intersection in years prior to 2005 indicated an average rate of 5.9 collisions per year compared to 4.3 collisions per year for this analysis. The recent collision data do not indicate any unusual traffic safety conditions in the site vicinity and none of the collisions resulted in fatalities.

3.5. Transit and Non-Motorized Facilities

Although NRDS customers do not likely use transit in the site vicinity, a description of transit service is provided to assess if there are existing bus stops in the vicinity that might be affected by the station improvements, and because some employees may use available service. King County Metro provides bus transit service to the study area. The site is directly served by Routes 26, 31 and 74. Route 26 provides service along N 35th Street with a transit stop for the eastbound service located at Carr Place N. The transit stop for westbound service is located on N 35th Street at Woodlawn Avenue N. There is a shelter at that location. Service along Stone Way N is provided by Routes 31 and 74.

Sidewalks currently exist along all of the streets fronting the site. The region's most utilized bike facility—the Burke Gilman Trail—is located south of N 34th Street along N Northlake Way. It accesses N 34th Street just west of Carr Place North where there are bicycle lanes on the street. The trail continues to the west on N 34th Street beyond the study area.

There is a sidewalk along the west side on Carr Place N between N 34th and 35th Streets, and on portions of the east side of this roadway.

3.6. Parking

The existing 20 NRDS employees park in various locations. Three (3) NRDS truck drivers typically park at SRDS and drive their transfer trucks to NRDS in the mornings and back to SRDS in the afternoons. The scale house employees park informally on site near the scales. The other NRDS employees either

park on street in the site vicinity, in the SPU-owned parking lot located northwest of the N 35th Street/Woodlawn Avenue N intersection, and at the SPU-owned 1550 Building parking lot located just north of N 34th Street between Carr Place N and Woodlawn Avenue N.

Several parking counts were performed to determine the number of vehicles parked on Carr Place N, in the SPU-owned parking lot, and at the SPU-owned 1550 Building parking lot. On January 24, 2008, there were three (3) vehicles parked on the east side of Carr Place N at 2:45 P.M. and three (3) vehicles parked at 5:45 P.M. No parking is permitted on the west side of the roadway. SPU currently rents half of the 46-stall parking lot to The Essential Baking Company, a business located one block to the south on the east side of Woodlawn Avenue N. On January 24, 2008, there were 34 vehicles parked in the lot at 3:00 P.M. (22 passenger vehicles and 12 large vans owned by The Essential Baking Company) and 21 vehicles parked at 5:45 P.M. (9 passenger vehicles and 12 vans).

There were nine (9) vehicles parked in the 15-stall parking lot at the 1550 Building at 2:50 P.M. The 1550 Building (previously occupied by the Oroweat Bakery) is currently unoccupied, but is a 30,000-square foot building that is permitted as an industrial use. If occupied, this building could generate a peak parking demand of approximately 30 vehicles based on manufacturing/industrial parking demand rates presented in *Parking Generation*[3].

[3] Third Edition, Institute of Transportation Engineers, 2004.

4. FUTURE NRDS TRIP GENERATION

Trip generation estimates were developed for two future conditions—2030 No-Action and 2030 with the Proposed Action. In addition, three traffic scenarios (high, medium, and low) were developed for both conditions to represent a range of possible waste flows and operational situations at NRDS in 2030. The following sub-sections describe the daily and hourly trips anticipated to be generated at NRDS for each of these conditions and scenarios.

4.1. No-Action Condition

Daily trips generated by NRDS were estimated for each vehicle type based on information provided by SPU. In 2030 with the No-Action condition, NRDS would generate several types of vehicle trips including:

- Collection trucks and self-haul vehicles that bring waste to the facility—including yard waste and food waste,
- Transfer trucks that take refuse from NRDS to off-site locations for disposal,
- Transfer trucks that take recyclable materials from NRDS to off-site locations for processing, and
- SPU employees who commute to and from the site.

4.1.1. Collection Trucks and Self-Haul Trips

Collection truck and self-haul trips that would be generated by NRDS in 2030 with the No-Action condition are described in *Waste Generation Projection Model and RDS Trip Generation Model Summary*[4]. These trip estimates are based on detailed future traffic projections for each of the various waste streams, seasonal peaking characteristics, and average vehicle loads. The information was compiled for two levels of use—an average day and a peak design day. These levels of use are defined as:

- An **average day** is the average of all days in a year,
- A **peak design day** represents an average day during a peak month (this is the condition for which all off-site traffic operations analysis were performed).

In addition, three traffic scenarios (high, medium, and low) were developed to represent a range of possible waste flows at NRDS in 2030.

- The **high-traffic** (e.g. **lower curbside recycling/diversion**) scenario assumptions include lower-than-anticipated recycling rates, which translates to higher waste trips through NRDS.
- The **medium-traffic** (e.g. **medium curbside recycling/diversion**) scenario assumptions include mid-range recycling rates equal to the baseline SPU recycling projections plus a package of recycling options as described in the report titled

[4] Herrera Environmental Consultants, Inc., January 8, 2008 (See Appendix A).

Seattle Solid Waste Recycling, Waste Reduction, and Facilities Opportunities[5]. This scenario would generate fewer waste trips through NRDS compared to the high-traffic scenario.

- The **low-traffic** (e.g. **high curbside recycling/diversion**) scenario assumptions include high recycling rates represented by baseline SPU recycling projections as revised in the *Seattle Solid Waste Recycling, Waste Reduction, and Facilities Opportunities*[6] report in addition to the package of programs endorsed by the City Council in Resolution 30990. This scenario would generate the fewest waste trips through NRDS.

More details regarding the three traffic scenarios can be found in *Waste Generation Projection Model and RDS Trip Generation Model Summary*[7]**.**

4.1.2. Refuse Transfer Truck Trips

Daily transfer truck trips generated by NRDS in 2030 with the No-Action condition are a function of the anticipated outbound disposal tonnage for each level of use and the capacity of the transfer trucks (26 tons-per-trip)[8]. The outbound disposal tonnage and transfer truck capacity for the No-Action condition are described in *Waste Generation Projection Model and RDS Trip Generation Model Summary*[9].

4.1.3. Other Transfer Truck Trips

Other transfer truck trips at NRDS include the transfer of recyclable materials from NRDS to various processing facilities in the Seattle area. Daily transfer truck trips for recyclable materials were estimated by dividing the amount of material expected to be collected on site for each level of use and the ton-per-trip estimate for each recycled material provided by SPU[10]. The average ton-per-trip rates assumed in this analysis include:

- 2.7 tons-per-trip for traditional recyclables (glass, plastic, and paper),
- 6.2 tons-per-trip for metals,
- 8.3 tons-per-trip for construction, demolition, and landclearing (CDL) materials,
- 15.3 tons-per-trip for organics.

4.1.4. Employee Trips

Employee trips generated in 2030 with the No-Action condition were estimated based on projected employment information provided by SPU, which includes 22 employees on the NRDS site at any one

[5] URS Corporation, April 2007.
[6] URS Corporation, April 2007.
[7] Herrera Environmental Consultants, Inc., January 8, 2008 (See Appendix A).
[8] Source: Henry Friedman, Project Manager, Seattle Public Utilities, October 1, 2007
[9] Herrera Environmental Consultants, Inc., January 8, 2008 (See Appendix A).
[10] Source: Jenny Bagby, Principal Economist, SPU, November 2, 2007

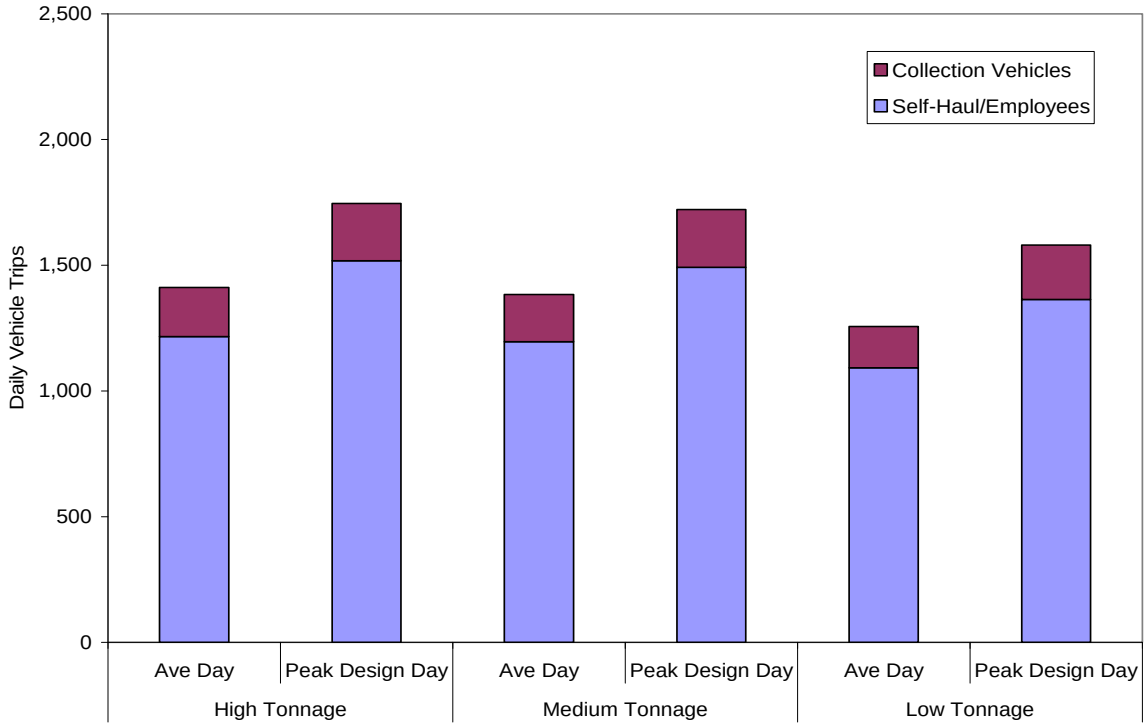
time[11]. NRDS employees include the crew chief, manager, laborers, compactor and heavy equipment operators, scale attendants, and truck drivers.

4.1.5. Total Daily Trips

Total daily trips generated by NRDS in 2030 with the No-Action condition were estimated by accounting for all inbound and outbound trips associated with each collection truck, self-haul vehicle, transfer truck, and employee vehicle. Each loaded vehicle entering or leaving NRDS generates two trips: one inbound and one outbound.

Figure 8 shows the estimated 2030 No-Action daily trips at NRDS for an average day and a peak design day for the three traffic scenarios. The majority of vehicles generated by NRDS are expected to be self-haul vehicles, which comprise between 83% and 84% of the daily volume in 2030 with the No-Action condition depending on the design day and the traffic scenario. The highest number of trips would be generated on a peak design day with the high-traffic scenario. Trip details for the average day and peak design day are summarized in Table 2 and Table 3, respectively.

Figure 8. 2030 No-Action Daily Trips at NRDS



Source: Heffron Transportation, Inc. using information provided by Seattle Public Utilities and trip models provided by Herrera Environmental Consultants, Inc., November 2007.

[11] Source: Jenny Bagby, Principal Economist, SPU, November 2, 2007

4.2. Proposed Action Condition

The Proposed Action at NRDS would reconstruct the existing facilities to include a larger tipping building, more scales, and enhanced recycling facilities. The following changes in trip making at NRDS in 2030 with the Proposed Action are projected:

- Self-haul trips would be slightly reduced because there would be more recycling opportunities, which would reduce the number of self-haul refuse trips.
- Refuse transfer truck trips would be reduced since more recyclables would be removed from the waste stream.
- Additional transfer truck trips for recyclables and reuse materials would be generated due to the enhanced recycling and reuse facilities on site.
- Employee trips would increase due to increased staffing needs associated with new waste streams.

In addition, for the **high-traffic scenario** it was assumed that on-site offices would be provided at NRDS for 10 additional SPU employees such as Solid Waste Field Representatives, Illegal Dumping Inspectors, Utility Service Inspectors, Graffiti Rangers, and Graffiti Painters. For the **medium-traffic scenario**, it was assumed that on-site offices would be provided at NRDS for five (5) additional SPU employees. For the **low-traffic scenario**, no additional offices were assumed at NRDS.

4.2.1. Collection Truck and Self-Haul Trips

The Proposed Action is not expected to change the number of collection truck trips to the facility. Those types of trips are dependent on the traffic scenarios and not the specific improvements that are proposed for NRDS. Self-haul trips that would be generated by NRDS in 2030 with the Proposed Action are based on assumptions listed in *Waste Generation Projection Model and RDS Trip Generation Model Summary*[12]. Self-haul trips are expected to decrease slightly because there will be more recycling opportunities for CDL waste, which would reduce the number of self-haul refuse trips.

4.2.2. Transfer Truck Trips

Transfer truck trips for refuse and recyclable materials were estimated using the methodology described for the No-Action condition. Refuse transfer truck trips would be reduced since more recyclables would be removed from the waste stream. However, additional transfer truck trips for recyclable and reuse materials would be generated due to enhanced recycling and reuse facilities. For this analysis, recovered reuse materials from NRDS were assumed to be transferred to SRDS in trucks with an average capacity of one-ton-per trip.

4.2.3. Employee Trips

The number of employees at NRDS is expected to increase in 2030 with the Proposed Action. Most of the additional employees are projected to work with the additional recycling facilities and the reuse

[12] Herrera Environmental Consultants, Inc., January 8, 2008 (See Appendix A).

materials that would be dropped off at the site. With the improvements, 27 employees are projected to be on site at one time on an average weekday and 29 employees on a peak design weekday[13]. In addition, as previously described, the analysis includes space for 10 additional SPU employees on site for the **high-traffic scenario**, five (5) additional employees for the **medium-traffic scenario**, and no additional employees for the **low-traffic scenario**.

4.2.4. Total Trips at NRDS

Table 2 and Table 3 present year 2030 trips for both the No-Action and Proposed Action conditions for an average day and a peak design day, respectively. As shown, daily trips at NRDS are expected to increase slightly with all traffic scenarios. The number of self-haul trips is expected to reduce slightly since the additional recycling opportunities are expected to slightly increase the amount of material brought to the site in each trip. The number of refuse transfer trucks generated with the project is expected to be less since more material would be separated from the general waste stream. There would, however, be an increase in other truck trips, which would include trucks removing recyclables from the site. There is also expected to be an increase in the number of employee trips with all of the scenarios.

Table 2. Daily Trip Summary at NRDS – Average Day

	2030 No Action Condition			2030 with Proposed Actions			Net Change		
Trip Type	Low Traffic	Med. Traffic	High Traffic	Low Traffic	Med. Traffic	High Traffic	Low Traffic	Med. Traffic	High Traffic
Collection Trucks	108	124	136	108	124	136	0	0	0
Self-Haul	1,042	1,146	1,166	1,036	1,140	1,142	-6	-6	-24
Refuse Transfer Truck	30	36	44	30	34	44	0	-2	0
Other Transfer Trucks	26	28	16	28	32	20	2	4	4
Employee	50	50	50	68	80	92	18	30	42
Total	1,254	1,384	1,412	1,268	1,410	1,434	14	26	22

Source: Heffron Transportation, Inc. using information provided by Seattle Public Utilities and trip models provided by Herrera Environmental Consultants, Inc., November 2007.

Table 3. Daily Trip Summary at NRDS – Peak Design Day

	2030 No Action Condition			2030 with Proposed Actions			Net Change		
Trip Type	Low Traffic	Med. Traffic	High Traffic	Low Traffic	Med. Traffic	High Traffic	Low Traffic	Med. Traffic	High Traffic
Collection Trucks	142	150	156	142	150	156	0	0	0
Self-Haul	1,308	1,436	1,462	1,302	1,428	1,454	-6	-8	-8
Refuse Transfer Truck	36	42	50	36	40	50	0	-2	0
Other Transfer Trucks	38	38	22	42	42	28	4	4	6
Employee	56	56	56	74	86	98	18	30	42
Total	1,580	1,722	1,746	1,596	1,746	1,786	16	24	40

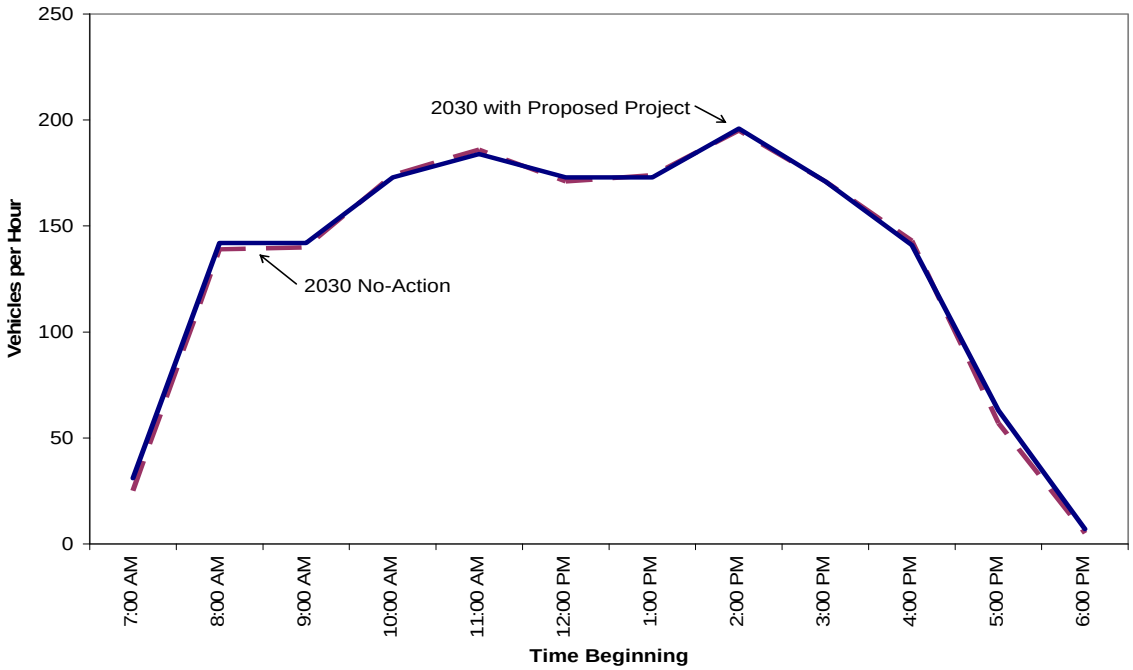
Source: Heffron Transportation, Inc. using information provided by Seattle Public Utilities and trip models provided by Herrera Environmental Consultants, Inc., November 2007.

[13] Sources: Jenny Bagby, Principal Economist, SPU, November 2, 2007, and Henry Friedman, Project Manager, SPU, November 8, 2007.

4.2.5. Hourly Trips at NRDS

Daily collection truck, self-haul, and transfer truck trips were translated into hourly trips based on 2006 trip data provided by SPU. Daily employee trips were translated into hourly trips based on employee shift information described in *Traffic Impact Analysis South Recycling and Disposal Station Reuse/Recycling Center and Construction and Demolition Annex*[14]. Even though this is for a different facility, this employee shift information was confirmed to be appropriate for existing and future use at NRDS by SPU staff[15]. Figure 9 and Figure 10 show the NRDS peak design day trips by hour for both the No-Action and Proposed Action conditions for the low-traffic, and high-traffic scenarios in 2030, respectively.

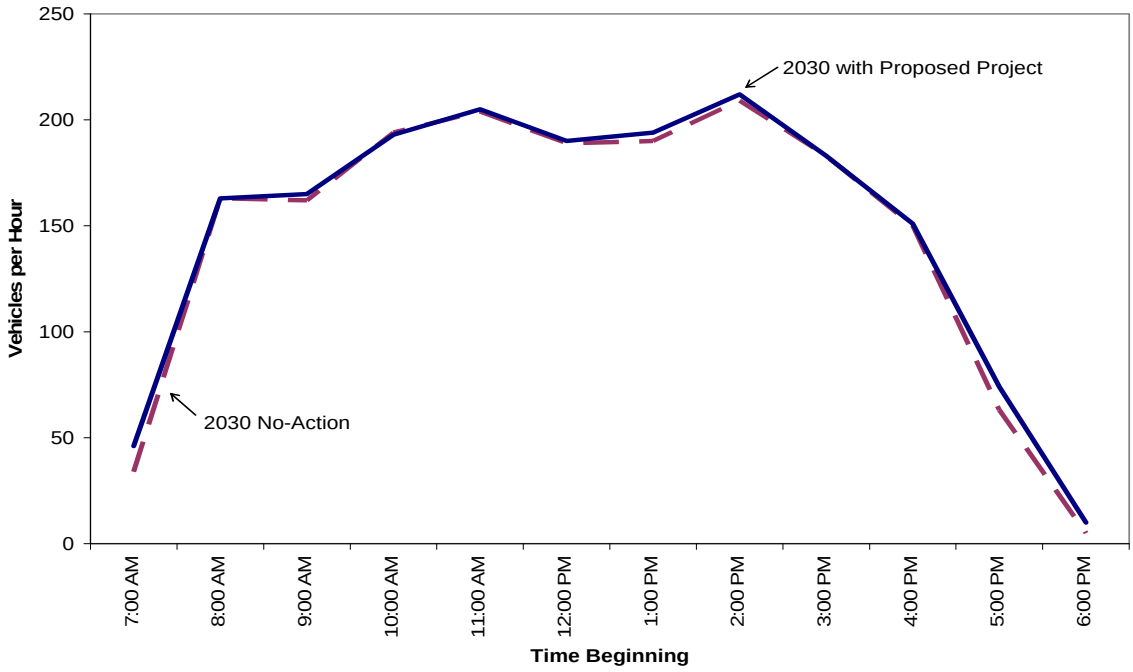
Figure 9. NRDS Hourly Distribution in 2030 – Peak Design Day – Low-Traffic Scenario



Source: Heffron Transportation, Inc. 2007

[14] Heffron Transportation, Inc., December 30, 1999
[15] Sherri Johnson, SPU, November 1, 2007

Figure 10. NRDS Hourly Trip Distribution in 2030 – Peak Design Day – High-Traffic Scenario



Source: Heffron Transportation, Inc. 2007

These figures show that trips generated by NRDS with the Proposed Action would be very similar to the No-Action condition for all traffic scenarios. For the high-traffic scenario, hourly trip changes would range from an increase of 12 trips between 7:00 and 8:00 A.M. to a decrease of one (1) trip between 10:00 and 11:00 A.M. During the PM peak hour (4:45 – 5:45 P.M.), there is expected to be an increase of about 11 vehicle trips.

5. PROJECT IMPACTS

This section of the report describes the conditions that would exist with the Proposed Action at NRDS. As described in Section 2, the Proposed Action would include a new transfer station on the existing NRDS site. Structures on the parcel east of NRDS would be demolished and new facilities would be constructed including a recycling drop-off area with recycling bins, offices, employee facilities, a meeting room, parking, and other utility facilities.

Locations of the site driveways are planned to be approximately the same with the Proposed Action. Vacating Carr Place N would allow the existing driveway to be widened to accommodate two inbound and outbound scales. The transfer truck access driveway on N 35th Street is not proposed to change.

5.1. Transportation Network

The Proposed Action would change the transportation network by vacating Carr Place N between N 34th and 35th Streets. As described in Section 3.1, approximately 90 vehicles travel on this roadway on an average weekday. Most of these trips occur between 8:00 A.M. and 5:00 P.M. and are likely associated with NRDS. SPU owns the properties on both sides of Carr Place N and would use the vacated right-of-

way to expand the recycling area at NRDS. This roadway provides little connectivity in the neighborhood since it is restricted to northbound-only traffic flow and does not extend south of N 34th Street. Woodlawn Avenue N is located approximately 150 feet to the east, which provides two-directional access between N 34th and 35th Streets. No significant adverse transportation impacts are anticipated due to vacating this portion of Carr Place N.

5.2. Traffic Volumes and Operations

The trip generation estimates presented in Section 4.2 show that traffic volumes generated by NRDS could increase as a result of the Proposed Action depending upon the traffic scenario and the analysis day. The projected daily trip increases range from 14 with the low-traffic scenario on an average weekday to 40 with the high-traffic scenario on a peak design day. The projected PM peak hour traffic increases range from six (6) to 11 trips with the low-traffic and high-traffic scenarios, respectively. These small increases in PM peak hour traffic would be generated by additional NRDS staff that would be used to sort refuse to enhance recycling and for possible additional SPU staff. SPU staff trips would likely split in several directions and are not expected to adversely impact any intersection or roadway. For example, even if all 11 trips from the high-traffic scenario were assumed to travel through the N 34th Street/Stone Way N intersection, the average delay at this intersection would increase by 1.1 seconds per vehicle (from 90.1 to 91.2 seconds per vehicle). This small increase in delay from this worst-case assumption would not be perceptible by the average motorist. Therefore, no adverse impacts to any off-site intersections are anticipated with the Proposed Action.

5.3. Site Access and Circulation

The NRDS driveway on N 34th Street is proposed to be shifted to the east with the vacation of Carr Place N. Although some trip increases could occur at NRDS with the Proposed Action, the additional trips would be employee-related trips that would not use the NRDS driveway on N 34th Street. Therefore, the number of trips using the main access driveway is not expected to increase with the Proposed Action. All movements at this intersection are expected to continue to operate at LOS C or better in 2030 during the PM peak hour on a peak design day with the Proposed Action. No adverse operating conditions are anticipated with the Proposed Action.

The Proposed Action would double the number of inbound and outbound scales at the proposed transfer station (from one to two) and would increase the number of stalls in the tipping building 17 to 23. Since the number of NRDS customers is not expected to increase with the Proposed Action and the capacity of the transfer station would increase, the number of queued vehicles is expected to be less than the No-Action condition. Therefore, no adverse queuing impacts are anticipated with the Proposed Action.

5.4. Traffic Safety

The proposed project is not expected to adversely affect traffic safety in the vicinity of NRDS. Existing accident records determined that there have been few accidents in the site vicinity, and traffic volumes are not expected to increase dramatically with the Proposed Action. Therefore, no adverse safety impacts are anticipated with the Proposed Action.

5.5. Transit and Non-Motorized Facilities

The proposed project would not adversely affect transit or non-motorized facilities in the area.

5.6. Parking

In 2030 with the Proposed Action, the number of employees on site simultaneously could range from 29 to 39 for the low-traffic and high-traffic scenarios, respectively[16]. The SPU-owned parking lot has 46 parking spaces, which would be sufficient to accommodate all NRDS-related employee parking. In addition, the Proposed Action would raze the 1550 Building, which would eliminate the potential peak parking demand of 30 additional vehicles. The Essential Baking Company trucks that currently park on the site are expected to shift back to The Essential Baking Company's parking lot located adjacent to its building on N 34th Street. Therefore, no adverse parking impacts are expected with the Proposed Action.

[16] Jenny Bagby, Principal Economist, SPU, November 2, 2007 and Henry Friedman, Project Manager, SPU, November 8, 2007

6. CONSTRUCTION

Reconstruction of the NRDS site is currently estimated to occur in 2011 and part of 2012, and NRDS would be closed during construction. Therefore, trips to and from NRDS would be much lower during construction compared to average day operations at NRDS. According to SPU staff[17], all parking for the contractors and construction trucks would be required to occur on site or in the SPU-owned parking lot. It may be necessary to temporarily relocate the bus shelter located on the north side of N 35 Street between Carr Place N and Woodlawn Avenue N, and the bus stop located at the southwest corner of N 35th Street and Carr Place N one block east or west during the construction period. This temporary change in bus stop location is not expected to adversely impact transit operations in the site vicinity. Therefore, no off-site or on-site transportation impacts are anticipated with construction of the Proposed Action.

7. CUMULATIVE IMPACTS

Construction of a new transfer station facility at SPU's NRDS site is expected to affect transportation operations in the vicinity of SRDS because all SPU collection truck and employee trips currently generated by NRDS would travel to SRDS during this construction phase. Although some of NRDS's customers may choose to use other transfer stations, the impact of all NRDS-generated trips was evaluated at SRDS during this construction phase. It was assumed that the new SRDS transfer station at the bus yard site would be open and operational, and the existing SRDS transfer station would also be open. A full analysis of the transportation impacts of the trips from NRDS at SRDS during the construction of NRDS is presented in the *Cumulative Impacts* section of the transportation report for improvements to SRDS (*Transportation Technical Report Seattle Public Utilities Transfer Station Improvement Project South Recycling and Disposal Station*, Heffron Transportation, Inc., February 6, 2008).

8. MITIGATION

No adverse transportation impacts were identified for the Proposed Action or for the construction of the Proposed Action. Therefore, no transportation mitigation would be required to accommodate SPU's Transfer Station Improvement Project at NRDS.

[17] Henry Friedman, Project Manager, SPU, February 27, 2008

REFERENCES

Heffron Transportation, Inc., *Traffic Impact Analysis SRDS Reuse/Recycling Center and Construction and Demolition Annex*, December 20, 1999.

Herrera Environmental Consultants, Inc., *Waste Generation Projection Model and RDS Trip Generation Model Summary*, January 8, 2008.

APPENDIX A

WASTE GENERATION PROJECTION MODEL AND RDS TRIP GENERATION MODEL SUMMARY

Herrera Environmental Consultants, Inc.

Memorandum

To	Seattle Public Utilities
From	Herrera Environmental Consultants
Date	January 8, 2008
Subject	Waste Generation Projection Model and RDS Trip Generation Model Summary

This memo summarizes the spreadsheet models used to estimate future waste stream projections and peak tonnage and traffic flows for the No Action and Proposed Action conditions at the proposed reconstruction of the South and North Recycling and Disposal Stations (SRDS and NRDS). The spreadsheet models were used to provide waste generation, recycling and disposal tonnages, and peak tonnage and traffic flows, for use in SEPA analysis of the proposed rebuild of SRDS and NRDS. A list of assumptions/variables that determine waste volume flow projections to the station is also included.

Waste Stream Tonnage Projection Model

A spreadsheet model was developed by Herrera to estimate the waste diversion effects of implementation of new waste reduction and recycling strategies during preparation of the report *Seattle Solid Waste Recycling, Waste Reduction, and Facilities Opportunities* (Waste Reduction Study) (URS 2007) for the City of Seattle. The spreadsheet model used during the Waste Reduction Study was used to generate waste generation, recycling and disposal tonnages through 2030 for use in SEPA analysis of the proposed SRDS.

Waste Generation

Waste generation is defined for this analysis as recycling plus disposal. Base tonnage generation, recycling, and disposal information for the analysis was provided by Seattle Public Utilities (SPU) for each of four sectors: single family residential, multi-family residential, commercial, and self-haul. The growth rates for the components of the waste stream (i.e., recycling and disposal) in each sector were developed by SPU through the year 2012, which are based on an extrapolation of the underlying factors contributing to recycling and waste disposal. Herrera used the SPU growth rates for the years 2005-2012, and revised two of those growth rates downward for the long-term projection period 2013-2030. These growth rates were applied and carried forward for each component of the waste stream to the year 2030 at a constant rate. A comparison of both waste generation growth rates is included in Table 1

Table 1. Comparison of 60% Program and revised 60% Program recycling and disposal growth rates by sector

	SPU 60% Projections	Revised (after 2013)
Single-Family Residential:	0.6%	0.6%
Multi-Family Residential	1.9%	1.0%
Commercial	1.28%	1.28%
Self Haul	2.54%	2.15%

This methodology is consistent with that used by other local public agencies relying on forecasted data (e.g., Puget Sound Regional Council, Seattle City Light, Sound Transit), and is consistent with the modeling done by SPU for the Facility Master Plan (FMP) and previous environmental documents.

The most recent 60% Program base recycling tonnage estimates for all four sectors provided by SPU were reviewed during preparation of the Waste Reduction Study and adjusted slightly downward to reflect a moderated assumption about the ability to reach the 60% goal by 2010. This was accomplished by adjusting participation or efficiency assumptions based on recent actual data for recycling tonnage and customer sign-ups. The analysis did not conduct additional detailed evaluation of the assumptions behind the recycling tonnage projections provided by SPU, but rather, based on the review and assessment of the previous modeling and assumptions done by SPU, chose to model a conservative interpretation of that data.[1] The result was the "revised" 60% Program base recycling tonnages shown in Table 2, which formed the basis for all future tonnage modeling.

[1] In the Single Family residential sector, ultimate recovery rates were adjusted downward to better match historical growth rates in recovery rate increases for mixed scrap paper, food waste, beverage and container glass, food cans and aluminum beverage. The adjustments lowered the anticipated overall recovery rate for the sector from 97% to approximately 94% in 2010.

In the Multi Family residential sector, ultimate recovery rates were adjusted downward to better match historical growth in recovery rate increases in all material categories. The adjustments lowered the anticipated overall recovery rate for the sector from 39% to approximately 37% in 2010.

In the Commercial sector, ultimate recovery rates were adjusted downward to model a more conservative response to the ban on paper in commercial garbage; and to represent a more modest growth in the Commercial organics recycling program. The adjustments lowered the anticipated overall recovery rate for the sector from 67% to approximately 65% in 2010.

Table 2. Comparison of 60% Program and revised 60% Program tonnage estimates in 2008, 2020, 2025, 2038

	60% Program Tonnage Estimates	
	SPU Existing	Revised
Total Generated		
2008	822,877	822,877
2020	955,003	955,003
2025	1,016,408	1,016,408
2038	1,198,718	1,198,718
Disposed Waste		
2008	410,044	426,060
2020	438,593	468,112
2025	470,851	502,153
2038	568,257	604,742
Diverted to Recycling		
2008	412,833	396,817
2020	516,410	486,891
2025	545,557	514,255
2038	630,460	593,976

Waste Characterization

The next step in projecting the future waste stream was to model those materials that could be targeted for waste reduction or recycling. The disposed waste component for each of the four sectors was subdivided into 20 Recycling Potential Assessment model (RPA) waste categories based on the *2002 Residential Waste Stream Composition Study* (Cascadia, 2002) and the *2004 Commercial and Self Haul Waste Stream Composition Study* (Cascadia 2004). These RPA material categories were further grouped into seven material classes:

- Traditionals, including those material typically collected curbside such as Newspaper, Corrugated-Kraft, Computer-Office Paper, Mixed Scrap Paper, Other Paper, Plastics, Beverage Glass, Container Glass, Other Glass, Food Cans, Other Ferrous, Aluminum Beverage, Other Aluminum, Other Non-Ferrous

- C&D including wood waste and general construction debris

- Organics, including yard waste, food waste, a portion of other paper, and other organics

- Small Appliances and Electronics
- Hazardous (household chemicals, paint, etc.)
- White Goods / Bulky Items / Furniture
- Other.

Each of the seven material classes represents a distinct waste stream for which new waste reduction and recycling programs could be targeted.

Waste Diversion Potential

The next step in projecting the future waste stream was to model the effect of each new waste reduction and recycling strategy on its target material class. For each of the new waste reduction and recycling strategies, annual recycling rates (based on participation and efficiency), and maximum achievable recycling rates were estimated based on a combination of:

- Actual results from existing Seattle programs with similar focus or method;
- Actual results from other jurisdictions' programs with similar focus or method;
- Surveys of targeted customers or waste generators from other jurisdictions;
- Diversion rates for the three major stream components; recycling, MSW, organics
- Professional judgment of the Zero Waste project team.

In addition, a reasonable implementation year was assigned to each strategy within each material class based on a sequence of general approaches promoted by the City:

- Provide the service
- Modify the incentives associated with the service
- Employ product stewardship
- Employ regulatory approaches.

Following the assignment of the implementation date, a reasonable ramp up period was assigned, defined as the number of years necessary from the year of implementation to achieve the maximum achievable recycling rate. The assignment of this period was again informed by research and current experience regarding complexity of the strategy; lead

time required to minimize risk, engage stakeholders, or pass legislation; available budget; or a combination of all.

Finally, for those strategies that diverted disposed material to private recyclers, a recyclables processing "efficiency" rate was assigned to approximate the recycled yield versus residuals disposed anticipated from the recycler's efforts. The efficiency rate is based on existing data from local recyclers, and professional judgment based on observation. It was assumed that the remaining residual would be brought back to either the NRDS or SRDS for disposal as garbage. The end result was an estimate of tons diverted (either waste avoided or recycled) due to each new waste reduction or recycling strategy.

Tonnage Scenarios

The next step in projecting the future waste stream involved packaging together a specific mix of strategies into "scenarios" based on different levels of service for garbage, recycling, reuse, and organic waste handling for all material classes and sectors:

- **Scenario 1: Baseline.** 60% Program projections (revised) PLUS new waste reduction and recycling strategies, but with NO material bans.

- **Scenario 2:** 60% Program projections (revised) PLUS new waste reduction and recycling strategies with Organics Ban, Commercial Recyclables Ban, C&D Ban, and Other Materials Ban; but NO Self-Haul Bans (except C&D)

- **Scenario 3:** 60% Program projections (revised) PLUS new waste reduction and recycling strategies with Organics Ban, Commercial Recyclables Ban, C&D Ban, and Other Materials Ban; and Voluntary Self-Haul Ban (C&D mandatory)

- **Scenario 4:** 60% Program projections (revised) PLUS new waste reduction and recycling strategies with Organics Ban, Commercial Recyclables Ban, C&D Ban, and Other Materials Ban; and Mandatory Self-Haul Ban

- **Scenario 5:** 60% Program projections (revised) PLUS Council-specified new waste reduction and recycling strategies implemented as fast as possible.

These scenarios were developed in order to model the range of anticipated results for material diversion from implementation of new strategies and their contribution toward increasing Seattle's overall recycling rate; and to provide a "bracket" around the potential

tonnage and vehicle trips anticipated for City facilities through the facility planning horizon of 2030.

Tonnage Scenarios Used in the Trip Generation Model for the SEPA Evaluation

For the SEPA analyses of environmental impacts associated with the proposed reconstruction of SRDS and NRDS, three scenarios were generated for the trip generation model (high, medium, and low) to represent the range of anticipated waste flows to the City's stations, for both no-build and post-construction conditions.

1. High tonnage/traffic (lower curbside recycling/diversion). Based on the recycling rates used during SPU's Facility Master Plan process. This effort increased the recycling rate to 50% (aggregated) and then held it constant until 2050. Other preliminary assumptions contributing to the traffic directed to station includes:

    - Participation and efficiency in 60% programs fails to meet expectations, resulting in less diversion to curbside/private stations and more garbage to the station
    - Few additional new waste reduction and recycling programs are implemented (other than organics), resulting in less diversion to curbside/private stations, or private venues
    - Self-haul recycling traffic increases with new recycling and reuse areas
    - Reuse store customers at South Station (not open until 2013)
    - Yard waste / food waste from collection vehicles increases substantially due to education and incentives; operationally, all collected residential yard waste / food waste and all commercial food waste is directed to City stations
    - Truck trips increase to remove recyclables from the stations
    - Soil spoils and decant utility trucks at South Station (not open until 2013)
    - C&D line attracts self-haul contractors from North to South station, and away from private facilities.

2. Medium tonnage/traffic (medium curbside recycling/diversion). Baseline SPU recycling projections as revised by the Waste Reduction Study (Scenario

1). Other preliminary assumptions contributing to the traffic directed to the station includes:

- Participation and efficiency in 60% programs meets expectations, resulting in expected diversion to curbside/private stations
- Additional Zero Waste programs are implemented, resulting in moderate participation and diversion to curbside/private stations, or private venues
- Self-haul traffic numbers increase slightly over existing
- Minor change in Yard waste / food waste truck trips
- Self-haul recycling traffic increases with new recycling and reuse areas
- Reuse store at South generates traffic beginning 2013
- Yard waste / food waste from collection vehicles increases modestly due to education and incentives; operationally, all collected residential yard waste / food waste and 50 percent of commercial food waste is directed to City stations
- No spoils or decant trucks at South Station
- C&D sorting line attracts some self-haul contractors from North to South station, and some away from private facilities.

3. Low tonnage/traffic (high curbside recycling/diversion). Baseline SPU recycling projections as revised by the Waste Reduction Study PLUS the package of programs endorsed by the City Council in Resolution 30990 (Scenario 5). Other preliminary assumptions contributing to the traffic directed to stations include:

- Participation and efficiency in 60% programs meets expectations, resulting in expected diversion to curbside/private stations
- Many new waste reduction and recycling programs are implemented, resulting in substantial participation and diversion to curbside/private stations, or private venues
- Self-haul numbers reduced because customers opt for additional home and business collection services

- Yard waste / food waste from collection vehicles increases slightly due to education and incentives; operationally, all collected residential yard waste / food waste and none of the commercial food waste is directed to City stations

- Reuse store at South generates traffic beginning 2013

- No spoils or decant facility at South

- C&D sorting line attracts no self-haul contractors from North to South station, and none away from private facilities.

The waste stream projection model produces the following tonnage inputs necessary for the trip generation model (described below) for each scenario in the years 2008, 2012, 2020, and 2030:

- Residential garbage
- Residential organics (yard waste / foodwaste)
- Self-haul garbage and recycling
- Self-haul yard waste
- Commercial garbage
- Commercial organics (foodwaste).

Trip Generation Model

A trip generation model, developed as part of the FMP process, was used to estimate incoming traffic flows using the three tonnage scenarios described above. The model reduces annual tonnage estimates to average daily and hourly incoming tonnage flows by waste and vehicle types. Peaking factors developed during the analysis for the FMP were used to convert average incoming tonnage flows into peak day and peak hourly tonnage flows. The number of vehicle trips (by associated waste and vehicle types) was then calculated using daily estimated tonnages, diversion rates, hourly distribution factors, and peaking factors described below. The following includes a brief description of the calculation worksheets in the model:

- Four worksheets named "*2008-tons, 2012-tons, 2020-tons, and 2030-tons*" convert the total annual incoming tonnage estimate into annual tonnage flows for cars, trucks, and large trucks for all the waste material categories and subcategories using the historic waste composition data for Seattle.

- Four worksheets named "*2008-flow, 2012-flow, 2020-flow, and 2030-flow*" calculate the daily and peak daily incoming flow of each material based on the main groupings of waste types (recycle, reuse, CDL, organics, and garbage).

- One worksheet named "*hourly distribution*" converts daily flows into hourly flows based on historic hourly distribution factors for each vehicle type.

- Twelve worksheets named "*2008-avg trips, 2008-p trips, 2008-peak trips, 2012-avg trips, 2012, p trips, etc* calculate the hourly trips (average, monthly peak, and peak) for each of the main vehicle types and distributes the vehicle trips to each of the main waste types areas (i.e., recycle, reuse, CDL, organics, and garbage)

- Four worksheets named "*2008-daily, 2012-daily, 2020-daily, and 2030-daily")* calculate the weekday and weekend tonnage and trips for the main groups of waste types.

The last three worksheets include the input data (tonnage) and reference data such as peaking factors for each vehicle, and recycle/recovery rates.

RDS Configuration

Since the proposed replacement recycling and disposal stations have not yet been designed, the trip generation model makes several assumptions about the physical

configuration of the stations. The model assumes that both the NRDS and SRDS are fully rebuilt and there is no intermodal site. Property acquisition includes a 9-acre parcel to the north of the existing SRDS site (the bus yard site), and the inclusion of a parcel immediately to the east of the existing NRDS site (which is already owned by the City of Seattle, but not currently associated with the NRDS). The SRDS includes a "target commingled" sort line for building materials waste and a retail reuse facility, and the NRDS includes an "enhanced" recycling facility (see "Within facility diversion" below).

Annual Tonnage Estimates

Estimates of annual tonnage arriving at the City's North and South recycling and disposal stations, based on the waste stream tonnage projection model (described above), are shown in Table 3.

Table 3. Estimated Tonnage Arriving at the City's North and South Recycling and Disposal Stations

	Tons per Year		
Scenario	**Low**	**Med**	**High**
Waste Stream Sector/Year			
Residential Garbage			
2008	123,268	123,881	131,210
2012	102,703	116,131	135,013
2020	103,570	118,241	144,299
2030	105,548	120,975	154,986
Residential Organics (YW/FW)			
2008	51,477	51,237	35,000
2012	66,653	56,284	35,000
2020	80,094	59,084	35,000
2030	84,231	60,502	35,000
SH Garbage & Recycling			
2008	115,028	121,842	113,246
2012	97,414	116,281	103,813
2020	108,226	120,904	120,041
2030	134,055	149,353	151,072
Self Haul Yard Waste			
2008	14,450	14,450	15,000
2012	14,450	14,450	15,000
2020	14,450	14,450	15,000
2030	14,450	14,450	15,000
Commercial Garbage			
2008	181,945	188,910	201,490
2012	136,511	155,334	205,235
2020	133,425	146,914	230,130
2030	128,290	157,400	261,342
Commercial Organics (FW)			
2008	26,743	26,743	0

	Tons per Year		
Scenario	**Low**	**Med**	**High**
Waste Stream Sector/Year			
2012	43,304	43,304	0
2020	61,750	58,358	0
2030	85,532	66,274	0
Total Stations Tonnage			
2008	486,168	500,320	495,946
2012	417,732	458,480	494,061
2020	439,766	459,593	544,470
2030	466,574	502,681	617,400

The annual tonnage is input into the trip generation model for four target years (2008, 2012, 2020, and 2030) in order to provide snapshots of future conditions. The year 2012 was used in order to model conditions when proposed construction of the north station requires all waste tonnage and traffic to be temporarily allocated to the south station.

Trip Generation

Characterization and Diversion of Waste Stream

The incoming waste stream includes self haul and collection-contractor collected materials. These materials include garbage, recyclables, reuse items, and organics such as yard waste and food waste. The waste stream can be diverted from facility to facility (disposal station-to-disposal station), or within the facility itself based on the characteristics of the incoming waste stream and the level of service provided at each of the system disposal facilities. This section describes the data sources, diversion assumptions for "facility-to-facility diversion," waste types, incoming vehicle types, and the level of service assumptions for "within facility diversion" used in the incoming tonnage and traffic flow portion of the model.

Data from several sources were used to estimate tonnage and traffic throughputs for a variety of waste types and vehicle types. The data used included:

1. Total annual incoming Self-Haul tonnage and trip data for Seattle – provided by SPU.
2. Waste composition and characterization - *2004 Commercial and Self-Haul Waste Stream Composition Study* – Prepared by Cascadia Consulting Group. SPU 2004.
3. CDL composition and characterization - *Construction, Demolition, and Landclearing Debris Waste Composition Study* – Prepared by Cascadia Consulting Group. SPU 1997. (data from 1995).
4. Projected diversion between Seattle disposal facilities – provided by SPU.

5. Recycle and recovery rates– *Reuse/Recycle Center Prototype Facility Development – Task 6 Technical Memorandum* – Herrera, May 15, 2002.
6. Traffic, vehicle, and vehicle load characteristics from the 2006 Transfer Station Billing System (TSBS) database provided by SPU
7. Growth rates, escalation rates, and traffic peaking factors provided by SPU.

Waste composition data is based on past studies conducted at the south and north transfer stations and was used by the model to distribute the total annual tonnage into different waste material types and vehicles. All existing traffic data from the sources listed above for the north and south transfer stations was collected by the hour, therefore, all traffic analysis was estimated on an hourly basis.

Facility-to-facility diversion

Facility-to-facility diversion includes the distribution of waste between the north recycle and disposal station (NRDS) and the south recycle and disposal station (SRDS). Waste material can also be diverted to private facilities. Diversion of the contract collected vehicles for both garbage and organics in the flow model is based on anticipated routing, truck capacity, truck parking locations, historical data, and operational judgment by SPU (All collection trucks can be contractually directed to specific facilities). Diversion of the self haul waste stream included a subjective approximation based on the assumed levels of services at each station. Anticipated waste allocation between the North and South recycling and disposal stations, and private stations, was provided by SPU, and is shown in Table 3.

Table 3. Waste Allocation Assumptions Between North and South Recycling and Disposal Stations, and Private Stations

	Low Tonnage/Traffic			Medium Tonnage/Traffic			High Tonnage/Traffic		
	NRDS	SRDS	Private	NRDS	SRDS	Private	NRDS	SRDS	Private
Residential Garbage	15%	85%	0%	15%	85%	0%	15%	85%	0%
Residential Organics (YW/FW)	50%	50%	0%	50%	50%	0%	50%	50%	0%
Self Haul Garbage & Recycling	50%	50%	0%	50%	50%	0%	50%	50%	0%
Self Haul Yard Waste	50%	50%	0%	50%	50%	0%	50%	50%	0%
Commercial Garbage	30%	70%	0%	30%	70%	0%	30%	70%	0%
Commercial Organics (FW)	0%	0%	100%	25%	25%	50%	50%	50%	0%

Waste types

Waste composition data is based on past studies conducted at the south and north transfer stations and was used by the model to distribute the total annual tonnage into different waste material types and vehicles. Waste was subdivided into the following six categories by the model, based on its potential to be removed and recovered from the overall waste stream at the stations.

1. Recyclables – Recyclables include the "Traditional" curbside recycle items including paper, cardboard (OCC), glass, plastic, and metals cans/containers.
2. Metals – The Metals category is unique in that metals are contained in the recyclables, reuse, CDL, and garbage categories, but it can be easily segregated from those categories and comprises a significant amount of the total incoming tonnage, therefore, it is has been segregated and included as it's own category.
3. Reuse – Reuse items includes items such as furniture, desks, and electronics, or may include many items that need minor repairs and can be easily fixed such as wooden furniture, small appliances, lawn mowers, etc..
4. CDL – Construction and Demolition Debris (CDL) includes mostly wood (dimensional lumber or demo wood), gypsum, roofing (wood or composite), and aggregates (concrete, brick, rock), and asphalt shingles.
5. Organics – Organics include yard wastes and food wastes. For this study, it was assumed that the facilities would accept self haul yard waste (no self haul food waste), collected yard waste, and collected commingled yard waste/food waste which may be collected in the future.
6. Garbage – Garbage is the remaining category that includes those items that are not recovered. It may include recyclable, reuse, or CDL items that can not be successfully recovered from the waste stream based on the recycling and recovery effort of the facility. Garbage is usually compacted and sent to a landfill for disposal.

Each of the six categories represents a distinct waste stream composition where the components demonstrate similar delivery and handling characteristics such as vehicle types, delivery times, peak delivery times, handling procedures, etc. Therefore, they can represent potentially separate operations within the facility where recyclables, metals, reuse, CDL, organics, and garbage are delivered, handled, or diverted.

Vehicle types

Waste is typically delivered to a transfer station by either contractor collected vehicles or self-haul vehicles. Contractor collected vehicles include curbside collection programs (packer trucks). Self-haul includes all non-City contracted vehicles and public vehicles. Contractor collected vehicles are typically larger, contain high-weight loads, and account for approximately ¾ of the annual tonnage, but account for less than ¼ of the total number of trips to the transfer stations. Self haul vehicles provide a wide variety of

vehicle and waste types and account for approximately ¼ of the total waste stream tonnage and over ¾ of the number of trips. Self haul vehicles include larger flatbed or end-dump trucks, to smaller cars, SUVs, vans, or pick-up trucks. Many of the typical self haul vehicle trips also include trailers. Table 3 shows tons/trip figures for all vehicle types based on 2006 data.

Table 3. Tons/trip used in the trip generation model for all vehicle types

Vehicle Type	Average tons/trip	
	Weekday	Weekend
Recycle-car	0.05	0.03
Recycle-truck	0.46	0.38
Garbage-car	0.189	0.189
Garbage-truck	0.510	0.334
Wood Waste-car	0.100	0.100
Wood Waste-truck	0.505	0.391
Yard Waste car	0.129	0.129
Yard Waste truck	0.278	0.239
Large Trucks	4.22	4.22
Collected Organics-Residential	6.51	6.81
Collected Organics-Commercial	7.0	7.0
Collected Garbage - Residential	6.94	6.26
Collected Garbage - Commercial	5.86	5.41
Transfer trucks	28.0	28.0

Within facility diversion

Once the waste arrives at the station, the level of service will affect the diversion of waste within the station. These levels of service include special facilities, buildings, or areas designated to encourage and improve the material recovery and diversion of recyclable and reusable material from the solid waste stream. For this analysis, it was assumed that the overall waste stream characteristics and composition would not change significantly from the composition identified in the 2004 waste composition data. Therefore, diversion was primarily a function of the level of services provided at each facility. The following five general categories were developed to represent varying levels of service that would affect diversion and recovery of material:

- Existing – status quo recovery rates (no level of service improvements)

- Enhanced – similar level of service as status quo with added recovery improvements (added bins) for selected CDL material only (wood and asphalt roofing). Otherwise the buildings would still have the same general facilities and level of service.

- Small commingled – improved recovery rates by providing a new building with a small tipping floor where select commingled loads may be dumped for segregation. The floor would only allow some loads to be dumped onto the floor. A new building also inherently indicates site redevelopment

- Target Commingled – greatly improved level of service and recovery rates by providing a larger tipping floor where commingled loads may be dumped for segregation. The floor would be large enough to accommodate a large percentage of the incoming loads (fast and desirable for users), but large enough to only target specific commodities. The remaining "hard-to-segregate" or cost prohibitive items would be combined with the garbage waste stream.

- Dirty MRF – vastly improved level of service and recovery rates by providing a larger tipping floor where all loads may be dumped for segregation. The building is large and convenient for users (no waiting), and large floor space , conveyors, and pick-lines would be utilized to maximize material segregation and recovery.

Recovery rates were estimated for each recoverable commodity based on the five levels of services described above. These recovery rates were based on previous work performed by Herrera for the City of Seattle, industry standards, and overall solid waste and recycling experience. For this analysis, it was assumed that the SRDS would include a "target commingled" sort line for building materials waste and a retail reuse facility, and the NRDS would include an "enhanced" recycling facility.

Appendix A includes example worksheets for the tonnage summary, data, and calculation worksheets for the high tonnage/traffic scenario.

Appendix A

Example Spreadsheet Model

NRDS - Tonnage Distribution to Each Recycle Area

350 <= yellow indicates cvalue varies and must be entered and checked for each option

Material	Annual Tonnage	Recycle Area	Vehicle type	Vehicle Distributed Tonnage	Tonnage						Trips					
					Average Day		Peak Month Day		Peak Day		Annual		Peak Month Day		Peak	
					weekday	weekend	weekday	weekend	weekday	weekend	weekday	weekend	weekday	weekend	weekday	weekend
Paper	2,186	Recycle	Rec-car	274	0.5	1.4	0.5	1.4	1.8	2.6	10.4	45.7	10.4	45.7	35.3	85.1
			Rec-truck	1912	3.6	9.6	3.9	10.4	9.0	18.8	7.9	25.3	8.5	27.3	19.5	49.5
Plastic	944		Rec-car	118	0.2	0.6	0.2	0.6	0.8	1.1	4.5	19.7	4.5	19.7	15.2	36.7
			Rec-truck	825	1.6	4.1	1.7	4.5	3.9	8.1	3.4	10.9	3.7	11.8	8.4	21.4
Glass	906		Rec-car	114	0.2	0.6	0.2	0.6	0.7	1.1	4.3	19.0	4.3	19.0	14.6	35.3
			Rec-truck	793	1.5	4.0	1.6	4.3	3.7	7.8	3.3	10.5	3.5	11.3	8.1	20.5
Metals	4,401		Rec-car	551	1.0	2.8	1.0	2.8	3.6	5.1	20.9	92.1	20.9	92.1	71.1	171.3
			Rec-truck	3850	7.3	19.3	7.9	20.9	18.1	37.9	15.8	50.9	17.1	54.9	39.2	99.7
Reuse	3,342	Reuse	G-car	140	0.3	0.7	0.4	0.8	0.5	0.9	1.5	3.4	1.9	4.4	2.7	4.9
			G-truck	3,202	9.6	7.1	11.3	8.4	15.4	11.3	18.8	21.3	22.1	25.1	30.3	33.9
CDL-wood	4,414	Source Sep.	WW-car	24	0.1	0.1	0.1	0.2	0.2	0.4	0.5	1.1	1.0	2.2	1.6	3.8
			WW-truck	4,390	14.0	7.4	19.9	10.5	39.3	21.8	27.8	19.0	39.4	27.0	77.9	55.8
	20,108	Tipping Floor	WW-car	111	0.2	0.5	0.5	1.0	0.7	1.7	2.3	5.0	4.7	10.0	7.5	17.4
			WW-truck	19,997	64.0	33.9	90.6	48.0	179.2	99.3	126.7	86.7	179.4	122.8	354.8	254.1
CDL-Other	2,642	Source Sep.	G-car	111	0.2	0.5	0.3	0.7	0.4	0.7	1.2	2.7	1.5	3.5	2.1	3.9
			G-truck	2,531	7.6	5.6	8.9	6.6	12.2	9.0	14.9	16.9	17.5	19.8	23.9	26.8
	12,046	Tipping Floor	G-car	506	1.0	2.4	1.3	3.0	1.8	3.3	5.4	12.4	6.9	15.8	9.7	17.6
			G-truck	11,540	34.6	25.7	40.7	30.2	55.7	40.8	67.8	76.9	79.8	90.4	109.2	122.2
CDL-ODC	0		OD-CDL	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixed Rec	7,554	Tipping Floor	Lg Truck	7,554	22.6	16.8	26.6	19.8	36.4	26.7	5.4	4.0	6.3	4.7	8.6	6.3
Garbage	27,391	Tipping Floor	G-car	1,150	2.3	5.3	3.0	6.8	4.2	7.6	12.4	28.2	15.7	35.9	22.2	40.1
			G-truck	26,240	78.6	58.4	92.5	68.7	126.6	92.9	154.2	174.8	181.4	205.5	248.3	277.9
	23,248		Res Collect	23,248	75.1	38.0	81.8	41.4	97.6	38.0	10.8	6.1	11.8	6.6	14.1	6.1
	78,403		Com Collect	78,403	253.2	128.1	271.0	137.1	324.1	128.1	43.2	23.7	46.2	25.3	55.3	23.7
	0		OD-Garbage	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Organics	7,200	Organics	YW-car	364	0.7	1.8	1.2	3.0	2.0	4.1	5.4	13.9	9.1	23.3	15.4	32.2
			YW-truck	6,836	18.1	21.2	24.4	28.5	36.1	43.0	65.2	88.7	87.6	119.2	129.8	180.0
	0		OD-YW	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	17,500		Res Collect	17,500	67.8	0.0	107.8	0.0	104.5	0.0	10.4	0.0	16.6	0.0	16.0	0.0
	3,500		Com Collect	3,500	13.6	0.0	13.6	0.0	16.3	0.0	1.9	0.0	1.9	0.0	2.3	0.0

SH total => 85,932

SRDS - Tonnage Distribution to Each Recycle Area

Material	Annual Tonnage	Recycle Area	Vehicle type	Vehicle Distributed Tonnage	Tonnage						Trips					
					Average Day		Peak Month Day		Peak Day		Annual		Peak Month Day		Peak	
					weekday	weekend	weekday	weekend	weekday	weekend	weekday	weekend	weekday	weekend	weekday	weekend
Paper	3,479	Recycle	Rec-car	436	0.8	2.2	0.8	2.2	2.8	4.1	16.5	72.8	16.5	72.8	56.2	135.4
			Rec-truck	3043	5.8	15.3	6.2	16.5	14.3	29.9	12.5	40.2	13.5	43.4	31.0	78.8
Plastic	890		Rec-car	112	0.2	0.6	0.2	0.6	0.7	1.0	4.2	18.6	4.2	18.6	14.4	34.7
			Rec-truck	779	1.5	3.9	1.6	4.2	3.7	7.7	3.2	10.3	3.5	11.1	7.9	20.2
Glass	1,825		Rec-car	229	0.4	1.1	0.4	1.1	1.5	2.1	8.7	38.2	8.7	38.2	29.5	71.0
			Rec-truck	1596	3.0	8.0	3.3	8.7	7.5	15.7	6.6	21.1	7.1	22.8	16.3	41.3
Metals	5,347		Rec-car	670	1.3	3.4	1.3	3.4	4.3	6.2	25.4	111.9	25.4	111.9	86.3	208.1
			Rec-truck	4677	8.8	23.5	9.6	25.4	21.9	46.0	19.2	61.8	20.8	66.7	47.7	121.1
Reuse	8,182	Reuse	G-car	344	0.7	1.6	0.9	2.0	1.3	2.3	3.7	8.4	4.7	10.7	6.6	12.0
			G-truck	7,838	23.5	17.4	27.6	20.5	37.8	27.7	46.1	52.2	54.2	61.4	74.2	83.0
CDL-wood	16,692	Source Sep.	WW-car	92	0.2	0.4	0.4	0.8	0.6	1.4	1.9	4.1	3.9	8.3	6.2	14.4
			WW-truck	16,600	53.1	28.1	75.2	39.8	148.7	82.5	105.2	72.0	148.9	102.0	294.5	211.0
	2,695	Tipping Floor	WW-car	15	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.7	0.6	1.3	1.0	2.3
			WW-truck	2,680	8.6	4.5	12.1	6.4	24.0	13.3	17.0	11.6	24.0	16.5	47.5	34.1
CDL-Other	1,290	Source Sep.	G-car	54	0.1	0.3	0.1	0.3	0.2	0.4	0.6	1.3	0.7	1.7	1.0	1.9
			G-truck	1,236	3.7	2.8	4.4	3.2	6.0	4.4	7.3	8.2	8.5	9.7	11.7	13.1
	9,794	Tipping Floor	G-car	411	0.8	1.9	1.1	2.4	1.5	2.7	4.4	10.1	5.6	12.8	7.9	14.3
			G-truck	9,383	28.1	20.9	33.1	24.6	45.3	33.2	55.1	62.5	64.9	73.5	88.8	99.4
CDL-ODC	0		OD-CDL	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixed Rec	7,554	Tipping Floor	Lg Truck	7,554	22.6	16.8	26.6	19.8	36.4	26.7	5.4	4.0	6.3	4.7	8.6	6.3
Garbage	31,485	Tipping Floor	G-car	1,322	2.7	6.1	3.4	7.8	4.8	8.7	14.2	32.5	18.1	41.3	25.5	46.1
			G-truck	30,162	90.4	67.1	106.3	78.9	145.5	106.7	177.3	200.9	208.5	236.2	285.4	319.4
	131,738		Res Collect	131,738	425.5	215.3	463.8	234.6	553.2	215.3	61.3	34.4	66.8	37.5	79.7	34.4
	182,939		Com Collect	182,939	590.9	298.9	632.3	319.8	756.3	298.9	100.8	55.3	107.9	59.1	129.1	55.3
	0		OD-Garbage	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Organics	7,200	Organics	YW-car	364	0.7	1.8	1.2	3.0	2.0	4.1	5.4	13.9	9.1	23.3	15.4	32.2
			YW-truck	6,836	18.1	21.2	24.4	28.5	36.1	43.0	65.2	88.7	87.6	119.2	129.8	180.0
	0		OD-YW	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	17,500		Res Collect	17,500	67.8	0.0	107.8	0.0	104.5	0.0	10.4	0.0	16.6	0.0	16.0	0.0
	3,500		Com Collect	3,500	13.6	0.0	13.6	0.0	16.3	0.0	1.9	0.0	1.9	0.0	2.3	0.0

SH total => 89,231

Private

Garbage	0		Res Collect	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0		Com Collect	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Organics	0		Res Collect	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0		Com Collect	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

647,891 <= total waste stream

total trips => 306,842

NRDS - 2008 Tonnage Distribution to Each hour (UPDATED 2006)

Material	Recycle Area	Vehicle type	Weekday Factors										Weekend Factors									
			hr 1	hr 2	hr 3	hr 4	hr 5	hr 6	hr 7	hr 8	hr 9	hr 10	hr 1	hr 2	hr 3	hr 4	hr 5	hr 6	hr 7	hr 8	hr 9	hr 10
Paper	Recycle	Rec-car	0.069	0.094	0.126	0.136	0.129	0.130	0.102	0.091	0.091	0.033	0.050	0.085	0.112	0.126	0.133	0.126	0.125	0.114	0.096	0.033
		Rec-truck	0.064	0.096	0.105	0.114	0.098	0.115	0.143	0.133	0.106	0.025	0.076	0.101	0.123	0.136	0.115	0.082	0.108	0.116	0.103	0.040
Plastic		Rec-car	0.069	0.094	0.126	0.136	0.129	0.130	0.102	0.091	0.091	0.033	0.050	0.085	0.112	0.126	0.133	0.126	0.125	0.114	0.096	0.033
		Rec-truck	0.064	0.096	0.105	0.114	0.098	0.115	0.143	0.133	0.106	0.025	0.076	0.101	0.123	0.136	0.115	0.082	0.108	0.116	0.103	0.040
Glass		Rec-car	0.069	0.094	0.126	0.136	0.129	0.130	0.102	0.091	0.091	0.033	0.050	0.085	0.112	0.126	0.133	0.126	0.125	0.114	0.096	0.033
		Rec-truck	0.064	0.096	0.105	0.114	0.098	0.115	0.143	0.133	0.106	0.025	0.076	0.101	0.123	0.136	0.115	0.082	0.108	0.116	0.103	0.040
Metals		Rec-car	0.069	0.094	0.126	0.136	0.129	0.130	0.102	0.091	0.091	0.033	0.050	0.085	0.112	0.126	0.133	0.126	0.125	0.114	0.096	0.033
		Rec-truck	0.064	0.096	0.105	0.114	0.098	0.115	0.143	0.133	0.106	0.025	0.076	0.101	0.123	0.136	0.115	0.082	0.108	0.116	0.103	0.040
Reuse	Reuse	G-car	0.061	0.085	0.113	0.122	0.115	0.123	0.122	0.119	0.104	0.035	0.062	0.081	0.102	0.118	0.121	0.124	0.129	0.120	0.108	0.034
		G-truck	0.095	0.097	0.114	0.121	0.111	0.116	0.117	0.109	0.090	0.030	0.070	0.085	0.106	0.121	0.121	0.120	0.121	0.119	0.104	0.033
CDL-wood	Source Sep.	WW-car	0.092	0.080	0.161	0.126	0.138	0.092	0.103	0.034	0.103	0.069	0.065	0.043	0.118	0.054	0.129	0.151	0.097	0.183	0.129	0.032
		WW-truck	0.099	0.092	0.117	0.119	0.109	0.100	0.141	0.111	0.089	0.024	0.060	0.090	0.094	0.128	0.116	0.128	0.102	0.120	0.114	0.050
	Tipping Floor	WW-car	0.092	0.080	0.161	0.126	0.138	0.092	0.103	0.034	0.103	0.069	0.065	0.043	0.118	0.054	0.129	0.151	0.097	0.183	0.129	0.032
		WW-truck	0.099	0.092	0.117	0.119	0.109	0.100	0.141	0.111	0.089	0.024	0.060	0.090	0.094	0.128	0.116	0.128	0.102	0.120	0.114	0.050
CDL-Other	Source Sep.	G-car	0.061	0.085	0.113	0.122	0.115	0.123	0.122	0.119	0.104	0.035	0.062	0.081	0.102	0.118	0.121	0.124	0.129	0.120	0.108	0.034
		G-truck	0.095	0.097	0.114	0.121	0.111	0.116	0.117	0.109	0.090	0.030	0.070	0.085	0.106	0.121	0.121	0.120	0.121	0.119	0.104	0.033
	Tipping Floor	G-car	0.061	0.085	0.113	0.122	0.115	0.123	0.122	0.119	0.104	0.035	0.062	0.081	0.102	0.118	0.121	0.124	0.129	0.120	0.108	0.034
		G-truck	0.095	0.097	0.114	0.121	0.111	0.116	0.117	0.109	0.090	0.030	0.070	0.085	0.106	0.121	0.121	0.120	0.121	0.119	0.104	0.033
CDL-ODC		OD-CDL																				
Mixed Rec	Tipping Floor	Lg Truck	0.095	0.097	0.114	0.121	0.111	0.116	0.117	0.109	0.090	0.030	0.070	0.085	0.106	0.121	0.121	0.120	0.121	0.119	0.104	0.033
Garbage	Tipping Floor	G-car	0.061	0.085	0.113	0.122	0.115	0.123	0.122	0.119	0.104	0.035	0.062	0.081	0.102	0.118	0.121	0.124	0.129	0.120	0.108	0.034
		G-truck	0.095	0.097	0.114	0.121	0.111	0.116	0.117	0.109	0.090	0.030	0.070	0.085	0.106	0.121	0.121	0.120	0.121	0.119	0.104	0.033
7:00 AM		Res Collect	0.135	0.102	0.143	0.107	0.123	0.131	0.175	0.071	0.012	0.001	0.321	0.075	0.075	0.022	0.076	0.243	0.189	0.000	0.000	0.000
7:00 AM		Com Collect	0.387	0.140	0.141	0.113	0.095	0.080	0.042	0.002	0.000	0.000	0.449	0.144	0.107	0.106	0.086	0.060	0.044	0.004	0.000	0.000
		OD-Garbage																				
Organics	Organics	YW-car	0.065	0.071	0.105	0.117	0.104	0.126	0.126	0.121	0.112	0.053	0.058	0.077	0.100	0.107	0.113	0.111	0.134	0.141	0.112	0.047
		YW-truck	0.082	0.084	0.101	0.103	0.105	0.114	0.119	0.127	0.123	0.042	0.068	0.077	0.097	0.110	0.118	0.120	0.129	0.128	0.113	0.040
		OD-YW																				
		Res Collect	0.006	0.010	0.070	0.171	0.124	0.140	0.191	0.168	0.099	0.020	0.000	0.048	0.161	0.097	0.177	0.274	0.242	0.000	0.000	0.000
		Com Collect	0.006	0.010	0.070	0.171	0.124	0.140	0.191	0.168	0.099	0.020	0.000	0.048	0.161	0.097	0.177	0.274	0.242	0.000	0.000	0.000

SRDS - 2008 Tonnage Distribution to Each hour (UPDATED 2006)

Material	Recycle Area	Vehicle type	Weekday Factors										Weekend Factors									
			hr 1	hr 2	hr 3	hr 4	hr 5	hr 6	hr 7	hr 8	hr 9	hr 10	hr 1	hr 2	hr 3	hr 4	hr 5	hr 6	hr 7	hr 8	hr 9	hr 10
			8																			
Paper	Recycle	Rec-car	0.079	0.081	0.119	0.119	0.111	0.133	0.131	0.103	0.091	0.033	0.057	0.060	0.096	0.099	0.102	0.101	0.162	0.158	0.118	0.047
		Rec-truck	0.095	0.094	0.121	0.144	0.136	0.101	0.103	0.094	0.076	0.037	0.101	0.111	0.126	0.138	0.138	0.108	0.098	0.085	0.074	0.023
Plastic		Rec-car	0.079	0.081	0.119	0.119	0.111	0.133	0.131	0.103	0.091	0.033	0.057	0.060	0.096	0.099	0.102	0.101	0.162	0.158	0.118	0.047
		Rec-truck	0.095	0.094	0.121	0.144	0.136	0.101	0.103	0.094	0.076	0.037	0.101	0.111	0.126	0.138	0.138	0.108	0.098	0.085	0.074	0.023
Glass		Rec-car	0.079	0.081	0.119	0.119	0.111	0.133	0.131	0.103	0.091	0.033	0.057	0.060	0.096	0.099	0.102	0.101	0.162	0.158	0.118	0.047
		Rec-truck	0.095	0.094	0.121	0.144	0.136	0.101	0.103	0.094	0.076	0.037	0.101	0.111	0.126	0.138	0.138	0.108	0.098	0.085	0.074	0.023
Metals		Rec-car	0.079	0.081	0.119	0.119	0.111	0.133	0.131	0.103	0.091	0.033	0.057	0.060	0.096	0.099	0.102	0.101	0.162	0.158	0.118	0.047
		Rec-truck	0.095	0.094	0.121	0.144	0.136	0.101	0.103	0.094	0.076	0.037	0.101	0.111	0.126	0.138	0.138	0.108	0.098	0.085	0.074	0.023
Reuse	Reuse	G-car	0.052	0.079	0.106	0.127	0.119	0.130	0.125	0.114	0.109	0.040	0.058	0.080	0.111	0.116	0.123	0.129	0.125	0.124	0.108	0.027
		G-truck	0.086	0.092	0.114	0.124	0.122	0.121	0.108	0.100	0.100	0.033	0.069	0.088	0.111	0.123	0.123	0.125	0.121	0.112	0.099	0.028
CDL-wood	Source Sep.	WW-car	0.194	0.111	0.028	0.056	0.222	0.139	0.083	0.056	0.056	0.056	0.083	0.000	0.042	0.125	0.083	0.250	0.167	0.167	0.083	0.000
		WW-truck	0.105	0.082	0.097	0.110	0.102	0.121	0.118	0.107	0.115	0.043	0.088	0.091	0.096	0.119	0.113	0.100	0.122	0.118	0.108	0.044
	Tipping Floor	WW-car	0.194	0.111	0.028	0.056	0.222	0.139	0.083	0.056	0.056	0.056	0.083	0.000	0.042	0.125	0.083	0.250	0.167	0.167	0.083	0.000
		WW-truck	0.105	0.082	0.097	0.110	0.102	0.121	0.118	0.107	0.115	0.043	0.088	0.091	0.096	0.119	0.113	0.100	0.122	0.118	0.108	0.044
CDL-Other	Source Sep.	G-car	0.052	0.079	0.106	0.127	0.119	0.130	0.125	0.114	0.109	0.040	0.058	0.080	0.111	0.116	0.123	0.129	0.125	0.124	0.108	0.027
		G-truck	0.086	0.092	0.114	0.124	0.122	0.121	0.108	0.100	0.100	0.033	0.069	0.088	0.111	0.123	0.123	0.125	0.121	0.112	0.099	0.028
	Tipping Floor	G-car	0.052	0.079	0.106	0.127	0.119	0.130	0.125	0.114	0.109	0.040	0.058	0.080	0.111	0.116	0.123	0.129	0.125	0.124	0.108	0.027
		G-truck	0.086	0.092	0.114	0.124	0.122	0.121	0.108	0.100	0.100	0.033	0.069	0.088	0.111	0.123	0.123	0.125	0.121	0.112	0.099	0.028
CDL-ODC		OD-CDL																				
Mixed Rec	Tipping Floor	Lg Truck	0.086	0.092	0.114	0.124	0.122	0.121	0.108	0.100	0.100	0.033	0.069	0.088	0.111	0.123	0.123	0.125	0.121	0.112	0.099	0.028
Garbage	Tipping Floor	G-car	0.052	0.079	0.106	0.127	0.119	0.130	0.125	0.114	0.109	0.040	0.058	0.080	0.111	0.116	0.123	0.129	0.125	0.124	0.108	0.027
		G-truck	0.086	0.092	0.114	0.124	0.122	0.121	0.108	0.100	0.100	0.033	0.069	0.088	0.111	0.123	0.123	0.125	0.121	0.112	0.099	0.028
7:00 AM		Res Collect	0.023	0.010	0.013	0.037	0.073	0.099	0.224	0.338	0.159	0.024	0.045	0.040	0.096	0.157	0.081	0.136	0.302	0.119	0.020	0.005
7:00 AM		Com Collect	0.287	0.099	0.099	0.116	0.106	0.122	0.099	0.049	0.017	0.005	0.355	0.188	0.196	0.138	0.059	0.035	0.024	0.003	0.003	0.000
		OD-Garbage																				
Organics	Organics	YW-car	0.065	0.090	0.126	0.115	0.122	0.108	0.108	0.112	0.104	0.050	0.068	0.077	0.113	0.113	0.092	0.126	0.128	0.118	0.130	0.036
		YW-truck	0.107	0.090	0.091	0.101	0.101	0.109	0.116	0.111	0.127	0.046	0.091	0.088	0.095	0.110	0.110	0.112	0.120	0.123	0.116	0.035
		OD-YW																				
		Res Collect	0.006	0.010	0.070	0.171	0.124	0.140	0.191	0.168	0.099	0.020	0.006	0.010	0.070	0.171	0.124	0.140	0.191	0.168	0.099	0.020
		Com Collect	0.006	0.010	0.070	0.171	0.124	0.140	0.191	0.168	0.099	0.020	0.006	0.010	0.070	0.171	0.124	0.140	0.191	0.168	0.099	0.020

Private

Garbage		Res Collect	0.054	0.056	0.092	0.100	0.137	0.229	0.219	0.096	0.017	0.054	0.056	0.092	0.100	0.137	0.229	0.219	0.096	0.017
		Com Collect	0.054	0.056	0.092	0.100	0.137	0.229	0.219	0.096	0.017	0.054	0.056	0.092	0.100	0.137	0.229	0.219	0.096	0.017
Organics		Res Collect	0.003	0.018	0.119	0.249	0.239	0.174	0.108	0.067	0.023	0.003	0.018	0.119	0.249	0.239	0.174	0.108	0.067	0.023
		Com Collect	0.003	0.018	0.119	0.249	0.239	0.174	0.108	0.067	0.023	0.003	0.018	0.119	0.249	0.239	0.174	0.108	0.067	0.023

NRDS - 2030 Peak Hourly Trip Distribution

Material	Recycle Area	Vehicle type	Weekday Trips										Weekend Trips									
			hr 1	hr 2	hr 3	hr 4	hr 5	hr 6	hr 7	hr 8	hr 9	hr 10	hr 1	hr 2	hr 3	hr 4	hr 5	hr 6	hr 7	hr 8	hr 9	hr 10
Paper	Recycle	Rec-car	2.422	3.312	4.441	4.782	4.543	4.598	3.588	3.226	3.199		4.290	7.214	9.563	10.738	11.274	10.687	10.610	9.717	8.159	
		Rec-truck	1.251	1.861	2.048	2.227	1.914	2.239	2.793	2.590	2.069		3.783	5.008	6.101	6.714	5.686	4.068	5.336	5.730	5.117	
Plastic		Rec-car	1.046	1.430	1.917	2.065	1.962	1.985	1.549	1.393	1.381		1.852	3.115	4.129	4.636	4.868	4.614	4.581	4.195	3.523	
		Rec-truck	0.540	0.804	0.884	0.961	0.827	0.967	1.206	1.118	0.893		1.634	2.162	2.634	2.899	2.455	1.756	2.304	2.474	2.210	
Glass		Rec-car	1.004	1.373	1.841	1.982	1.883	1.906	1.487	1.338	1.326		1.779	2.991	3.965	4.452	4.674	4.430	4.399	4.028	3.382	
		Rec-truck	0.519	0.772	0.849	0.923	0.794	0.928	1.158	1.074	0.858		1.568	2.076	2.529	2.783	2.357	1.686	2.212	2.375	2.122	
Metals		Rec-car	4.877	6.670	8.943	9.630	9.149	9.259	7.226	6.498	6.443		8.640	14.529	19.260	21.626	22.706	21.523	21.369	19.569	16.431	
		Rec-truck	2.520	3.748	4.124	4.484	3.856	4.509	5.625	5.215	4.168		7.619	10.086	12.288	13.521	11.451	8.192	10.746	11.539	10.306	
Reuse	Reuse	G-car	0.164	0.230	0.307	0.331	0.311	0.333	0.329	0.322	0.282	0.096	0.306	0.395	0.498	0.579	0.593	0.608	0.632	0.588	0.530	0.164
		G-truck	2.890	2.944	3.457	3.655	3.367	3.528	3.548	3.292	2.715	0.901	2.384	2.895	3.591	4.092	4.102	4.075	4.105	4.028	3.518	1.115
CDL-wood	Source Sep.	WW-car	0.151	0.132	0.264	0.207	0.226	0.151	0.170	0.057	0.170	0.113	0.246	0.164	0.451	0.205	0.493	0.575	0.369	0.698	0.493	0.123
		WW-truck	7.682	7.151	9.083	9.277	8.504	7.779	11.016	8.648	6.909	1.836	3.341	5.011	5.234	7.127	6.459	7.127	5.679	6.681	6.347	2.784
	Tipping Floor	WW-car	0.687	0.601	1.203	0.945	1.031	0.687	0.773	0.258	0.773	0.515	1.122	0.748	2.057	0.935	2.244	2.618	1.683	3.178	2.244	0.561
		WW-truck	34.996	32.575	41.379	42.260	38.738	35.437	50.184	39.399	31.475	8.364	15.218	22.828	23.842	32.466	29.422	32.466	25.871	30.437	28.915	12.682
CDL-Other	Source Sep.	G-car	0.130	0.181	0.242	0.261	0.246	0.263	0.260	0.254	0.223	0.076	0.242	0.312	0.393	0.457	0.469	0.480	0.499	0.465	0.419	0.130
		G-truck	2.284	2.327	2.733	2.889	2.661	2.788	2.804	2.602	2.146	0.712	1.884	2.288	2.839	3.234	3.242	3.221	3.244	3.183	2.781	0.881
	Tipping Floor	G-car	0.592	0.827	1.106	1.192	1.121	1.201	1.186	1.160	1.015	0.346	1.101	1.423	1.794	2.086	2.137	2.190	2.277	2.121	1.909	0.591
		G-truck	10.417	10.611	12.460	13.172	12.136	12.714	12.786	11.865	9.787	3.248	8.593	10.433	12.944	14.748	14.784	14.686	14.795	14.516	12.681	4.018
CDL-ODC		OC-CDL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mixed Rec	Tipping Floor	Lg Truck	0.824	0.839	0.985	1.042	0.960	1.005	1.011	0.938	0.774	0.257	0.445	0.541	0.671	0.764	0.766	0.761	0.767	0.752	0.657	0.208
Garbage	Tipping Floor	G-car	1.347	1.882	2.514	2.711	2.549	2.731	2.698	2.638	2.308	0.786	2.504	3.236	4.079	4.744	4.860	4.980	5.178	4.822	4.341	1.344
		G-truck	23.688	24.129	28.333	29.952	27.595	28.910	29.075	26.980	22.255	7.385	19.540	23.723	29.434	33.534	33.616	33.394	33.641	33.008	28.834	9.137
		Res Collect	1.897	1.432	2.011	1.499	1.732	1.847	2.458	1.002	0.171	0.014	1.948	0.454	0.454	0.132	0.462	1.475	1.145	0.000	0.000	0.000
		Com Collect	21.417	7.757	7.802	6.239	5.228	4.411	2.349	0.096	0.008	0.007	10.634	3.408	2.538	2.512	2.037	1.431	1.036	0.083	0.000	0.000
		OD-Garbage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Organics	Organics	YW-car	1.004	1.092	1.614	1.791	1.594	1.939	1.939	1.850	1.712	0.817	1.870	2.474	3.214	3.448	3.623	3.565	4.325	4.520	3.604	1.519
		YW-truck	10.647	10.909	13.131	13.365	13.663	14.856	15.438	16.445	15.920	5.394	12.203	13.769	17.424	19.816	21.274	21.687	23.253	23.036	20.317	7.200
		OD-YW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Res Collect	0.094	0.167	1.118	2.746	1.997	2.249	3.063	2.704	1.585	0.321	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Com Collect	0.014	0.024	0.162	0.398	0.289	0.326	0.444	0.392	0.230	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Traditional =>	**14.2**	**20.0**	**25.0**	**27.1**	**24.9**	**26.4**	**24.6**	**22.5**	**20.3**	**0.0**	**31.2**	**47.2**	**60.5**	**67.4**	**65.5**	**57.0**	**61.6**	**59.6**	**51.2**	**0.0**
		Reuse =>	**3.1**	**3.2**	**3.8**	**4.0**	**3.7**	**3.9**	**3.9**	**3.6**	**3.0**	**1.0**	**2.7**	**3.3**	**4.1**	**4.7**	**4.7**	**4.7**	**4.7**	**4.6**	**4.0**	**1.3**
		CDL (source separated) =>	**10.2**	**9.8**	**12.3**	**12.6**	**11.6**	**11.0**	**14.2**	**11.6**	**9.4**	**2.7**	**5.7**	**7.8**	**8.9**	**11.0**	**10.7**	**11.4**	**9.8**	**11.0**	**10.0**	**3.9**
		CDL - (soure separated and commingled) =>	**10.2**	**9.8**	**12.3**	**12.6**	**11.6**	**11.0**	**14.2**	**11.6**	**9.4**	**2.7**	**5.7**	**7.8**	**8.9**	**11.0**	**10.7**	**11.4**	**9.8**	**11.0**	**10.0**	**3.9**
		Garbage Pit/Floor (self haul) =>	**72.6**	**71.5**	**88.0**	**91.3**	**84.1**	**82.7**	**97.7**	**83.2**	**68.4**	**20.9**	**48.5**	**62.9**	**74.8**	**89.3**	**87.8**	**91.1**	**84.2**	**88.8**	**79.6**	**28.5**
		Garbage Pit/Floor (collected) =>	**23.3**	**9.2**	**9.8**	**7.7**	**7.0**	**6.3**	**4.8**	**1.1**	**0.2**	**0.0**	**12.6**	**3.9**	**3.0**	**2.6**	**2.5**	**2.9**	**2.2**	**0.1**	**0.0**	**0.0**
		Yard Waste (self-haul) =>	**11.7**	**12.0**	**14.7**	**15.2**	**15.3**	**16.8**	**17.4**	**18.3**	**17.6**	**6.2**	**14.1**	**16.2**	**20.6**	**23.3**	**24.9**	**25.3**	**27.6**	**27.6**	**23.9**	**8.7**
		Yard Waste (collected) =>	**0.1**	**0.2**	**1.3**	**3.1**	**2.3**	**2.6**	**3.5**	**3.1**	**1.8**	**0.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
		Scale Traffic =>	**117.9**	**102.6**	**126.1**	**129.9**	**120.3**	**119.3**	**137.7**	**117.3**	**97.5**	**30.2**	**80.9**	**90.8**	**107.4**	**126.2**	**125.9**	**130.7**	**123.8**	**127.5**	**113.5**	**41.2**

SRDS - 2030 Tonnage Distribution to Each Hour

Material	Recycle Area	Vehicle type	Weekday Factors										Weekend Factors									
			hr 1	hr 2	hr 3	hr 4	hr 5	hr 6	hr 7	hr 8	hr 9	hr 10	hr 1	hr 2	hr 3	hr 4	hr 5	hr 6	hr 7	hr 8	hr 9	hr 10
Paper	Recycle	Rec-car	3.855	5.271	7.068	7.611	7.231	7.318	5.711	5.136	5.092		6.829	11.483	15.222	17.092	17.946	17.011	16.889	15.466	12.987	
		Rec-truck	1.992	2.963	3.259	3.544	3.047	3.564	4.446	4.122	3.294		6.022	7.972	9.712	10.687	9.051	6.475	8.494	9.120	8.146	
Plastic		Rec-car	0.986	1.349	1.809	1.948	1.851	1.873	1.462	1.314	1.303		1.748	2.939	3.896	4.374	4.593	4.354	4.322	3.958	3.324	
		Rec-truck	0.510	0.758	0.834	0.907	0.780	0.912	1.138	1.055	0.843		1.541	2.040	2.486	2.735	2.316	1.657	2.174	2.334	2.085	
Glass		Rec-car	2.022	2.765	3.707	3.992	3.793	3.838	2.995	2.694	2.671		3.582	6.022	7.984	8.964	9.412	8.922	8.858	8.112	6.811	
		Rec-truck	1.045	1.554	1.709	1.859	1.598	1.869	2.332	2.162	1.728		3.158	4.181	5.094	5.605	4.747	3.396	4.455	4.783	4.272	
Metals		Rec-car	5.924	8.102	10.864	11.698	11.114	11.248	8.778	7.894	7.827		10.496	17.649	23.397	26.271	27.583	26.146	25.958	23.772	19.961	
		Rec-truck	3.061	4.553	5.009	5.448	4.684	5.477	6.833	6.336	5.063		9.256	12.252	14.927	16.425	13.911	9.952	13.055	14.018	12.520	
Reuse	Reuse	G-car	0.402	0.562	0.751	0.810	0.761	0.816	0.806	0.788	0.690	0.235	0.748	0.967	1.218	1.417	1.452	1.487	1.547	1.440	1.297	0.401
		G-truck	7.075	7.207	8.463	8.947	8.243	8.635	8.685	8.059	6.647	2.206	5.837	7.086	8.792	10.017	10.041	9.975	10.048	9.859	8.613	2.729
CDL-wood	Source Sep.	WW-car	0.570	0.499	0.998	0.784	0.856	0.570	0.642	0.214	0.642	0.428	0.931	0.621	1.707	0.776	1.862	2.173	1.397	2.638	1.862	0.466
		WW-truck	29.051	27.041	34.349	35.080	32.157	29.416	41.657	32.705	26.127	6.943	12.633	18.949	19.791	26.950	24.424	26.950	21.476	25.266	24.002	10.527
	Tipping Floor	WW-car	0.092	0.081	0.161	0.127	0.138	0.092	0.104	0.035	0.104	0.069	0.150	0.100	0.276	0.125	0.301	0.351	0.226	0.426	0.301	0.075
		WW-truck	4.690	4.365	5.545	5.663	5.191	4.749	6.725	5.280	4.218	1.121	2.039	3.059	3.195	4.351	3.943	4.351	3.467	4.079	3.875	1.700
CDL-Other	Source Sep.	G-car	0.063	0.089	0.118	0.128	0.120	0.129	0.127	0.124	0.109	0.037	0.118	0.152	0.192	0.223	0.229	0.235	0.244	0.227	0.204	0.063
		G-truck	1.116	1.136	1.334	1.411	1.300	1.362	1.369	1.271	1.048	0.348	0.920	1.117	1.386	1.579	1.583	1.573	1.584	1.555	1.358	0.430
	Tipping Floor	G-car	0.481	0.673	0.899	0.969	0.911	0.976	0.965	0.943	0.825	0.281	0.896	1.157	1.458	1.696	1.738	1.781	1.851	1.724	1.552	0.481
		G-truck	8.470	8.628	10.131	10.710	9.867	10.337	10.396	9.647	7.958	2.641	6.987	8.483	10.525	11.991	12.020	11.941	12.029	11.803	10.310	3.267
CDL-ODC		OC-CDL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mixed Rec	Tipping Floor	Lg Truck	0.824	0.839	0.985	1.042	0.960	1.005	1.011	0.938	0.774	0.257	0.445	0.541	0.671	0.764	0.766	0.761	0.767	0.752	0.657	0.208
Garbage	Tipping Floor	G-car	1.548	2.163	2.890	3.116	2.930	3.139	3.101	3.032	2.653	0.903	2.879	3.720	4.688	5.453	5.587	5.724	5.952	5.543	4.990	1.545
		G-truck	27.228	27.736	32.568	34.429	31.720	33.231	33.421	31.013	25.581	8.489	22.461	27.269	33.833	38.546	38.641	38.386	38.669	37.942	33.144	10.503
		Res Collect	10.751	8.114	11.398	8.495	9.817	10.468	13.930	5.679	0.972	0.081	11.037	2.573	2.573	0.746	2.616	8.356	6.486	0.000	0.000	0.000
		Com Collect	49.974	18.099	18.204	14.559	12.198	10.293	5.480	0.224	0.019	0.017	24.812	7.953	5.922	5.862	4.754	3.340	2.418	0.193	0.000	0.000
		OD-Garbage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Organics	Organics	YW-car	1.004	1.092	1.614	1.791	1.594	1.939	1.939	1.850	1.712	0.817	1.870	2.474	3.214	3.448	3.623	3.565	4.325	4.520	3.604	1.519
		YW-truck	10.647	10.909	13.131	13.365	13.663	14.856	15.438	16.445	15.920	5.394	12.203	13.769	17.424	19.816	21.274	21.687	23.253	23.036	20.317	7.200
		OD-YW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Res Collect	0.094	0.167	1.118	2.746	1.997	2.249	3.063	2.704	1.585	0.321	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Com Collect	0.014	0.024	0.162	0.398	0.289	0.326	0.444	0.392	0.230	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Traditional =>	**19.4**	**27.3**	**34.3**	**37.0**	**34.1**	**36.1**	**33.7**	**30.7**	**27.8**	**0.0**	**42.6**	**64.5**	**82.7**	**92.2**	**89.6**	**77.9**	**84.2**	**81.6**	**70.1**	**0.0**
		Reuse =>	**7.5**	**7.8**	**9.2**	**9.8**	**9.0**	**9.5**	**9.5**	**8.8**	**7.3**	**2.4**	**6.6**	**8.1**	**10.0**	**11.4**	**11.5**	**11.5**	**11.6**	**11.3**	**9.9**	**3.1**
		CDL (source separated) =>	**30.8**	**28.8**	**36.8**	**37.4**	**34.4**	**31.5**	**43.8**	**34.3**	**27.9**	**7.8**	**14.6**	**20.8**	**23.1**	**29.5**	**28.1**	**30.9**	**24.7**	**29.7**	**27.4**	**11.5**
		CDL - (soure separated and commingled) =>	**45.4**	**43.4**	**54.5**	**55.9**	**51.5**	**48.6**	**63.0**	**51.2**	**41.8**	**12.1**	**25.1**	**34.2**	**39.2**	**48.5**	**46.9**	**50.1**	**43.0**	**48.5**	**44.1**	**17.2**
		Garbage Pit/Floor (self haul) =>	**28.8**	**29.9**	**35.5**	**37.5**	**34.6**	**36.4**	**36.5**	**34.0**	**28.2**	**9.4**	**25.3**	**31.0**	**38.5**	**44.0**	**44.2**	**44.1**	**44.6**	**43.5**	**38.1**	**12.0**
		Garbage Pit/Floor (collected) =>	**60.7**	**26.2**	**29.6**	**23.1**	**22.0**	**20.8**	**19.4**	**5.9**	**1.0**	**0.1**	**35.8**	**10.5**	**8.5**	**6.6**	**7.4**	**11.7**	**8.9**	**0.2**	**0.0**	**0.0**
		Yard Waste (self-haul) =>	**11.7**	**12.0**	**14.7**	**15.2**	**15.3**	**16.8**	**17.4**	**18.3**	**17.6**	**6.2**	**14.1**	**16.2**	**20.6**	**23.3**	**24.9**	**25.3**	**27.6**	**27.6**	**23.9**	**8.7**
		Yard Waste (collected) =>	**0.1**	**0.2**	**1.3**	**3.1**	**2.3**	**2.6**	**3.5**	**3.1**	**1.8**	**0.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
		Scale Traffic =>	**146.6**	**111.7**	**135.6**	**134.8**	**125.7**	**125.1**	**139.8**	**112.5**	**90.5**	**28.2**	**100.4**	**91.9**	**106.9**	**122.3**	**123.4**	**131.2**	**124.1**	**119.7**	**106.2**	**38.0**

Private

Garbage		Res Collect	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Com Collect	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Organics		Res Collect	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Com Collect	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Total =>	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

NRDS - 2030 Daily Tonnage and Trips

Recycle Area	Material	Tonnage						Trips					
		Average Day		Peak Month Day		Peak Day		Annual		Peak Month Day		Peak	
		weekday	weekend	weekday	weekend	weekday	weekend	weekday	weekend	weekday	weekend	weekday	weekend
Recycle	Traditionals	7.6	20.3	8.2	21.7	19.8	39.4	33.7	131.1	34.8	134.8	101.1	248.5
	metals	8.3	22.1	8.9	23.6	21.6	43.0	36.7	143.0	38.0	147.0	110.3	271.0
Reuse	Reuse	9.9	7.8	11.6	9.2	16.0	12.3	20.3	24.8	24.1	29.5	33.0	38.8
CDL	Source Separated	21.9	13.7	29.2	18.0	52.1	31.9	44.4	39.7	59.4	52.4	105.6	90.3
	Commingled	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Garbage	Self-haul	81	64	95	75	131	100.4	166.6	203.0	197.1	241.4	270.5	317.9
	Commingled CDL	122	79	160	102	274	172.0	207.7	184.9	277.1	243.7	489.9	417.7
	Collected	328	166	353	178	422	166.1	54.0	29.7	58.0	32.0	69.4	29.7
Organics	Self-haul	19	23	26	31	38	47.2	70.7	102.5	96.8	142.4	145.1	212.1
	Collected	81	0	121	0	121	0.0	12.4	0.0	18.5	0.0	18.4	0.0

SRDS - 2030 Daily Tonnage and Trips

Recycle Area	Material	Tonnage						Trips					
		Average Day		Peak Month Day		Peak Day		Annual		Peak Month Day		Peak	
		weekday	weekend	weekday	weekend	weekday	weekend	weekday	weekend	weekday	weekend	weekday	weekend
Recycle	Traditionals	11.7	31.1	12.5	33.3	30.4	60.6	51.7	201.2	53.5	206.9	155.2	381.4
	Metals	10.1	26.8	10.8	28.7	26.2	52.3	44.6	173.7	46.1	178.6	134.0	329.2
Reuse	Reuse	24.2	19.0	28.5	22.5	39.1	30.0	49.8	60.6	58.9	72.1	80.8	95.0
CDL	Source Separated	57.1	31.6	80.1	44.2	155.5	88.6	115.0	85.7	162.1	121.7	313.5	240.4
	Commingled	60.2	44.2	72.9	53.3	107.3	76.2	82.2	88.9	101.5	108.8	153.9	156.4
Garbage	Self-haul	93.1	73.3	109.7	86.8	150.3	115.5	191.5	233.3	226.6	277.5	310.9	365.5
	Commingled CDL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Collected	1,016.4	514.2	1,096.1	554.5	1,309.5	514.2	162.1	89.6	174.7	96.6	208.8	89.6
Organics	Self-haul	18.8	23.0	25.5	31.5	38.0	47.2	70.7	102.5	96.8	142.4	145.1	212.1
	Collected	81.4	0.0	121.4	0.0	120.7	0.0	12.4	0.0	18.5	0.0	18.4	0.0

Private - 2030 Daily Tonnage and Trips

Garbage	Collected	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Organics	Collected	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

NRDS - 2030 Summary

			Weekday Summary														Weekend Summary													
Recycle Area	Material	Annual Tonnage	Incoming Quantities tons	Incoming Quantities volume (CY)	Recovered tons	Disposed tons	Avg Trips	# of stalls	90% Trips	# of stalls	95% Trips	# of stalls	100% Trips	# of stalls	Peak Trips	# of stalls	Incoming Quantities tons	Incoming Quantities volume (CY)	Recovered tons	Disposed tons	Avg Trips	# of stalls	90% Trips	# of stalls	95% Trips	# of stalls	100% Trips	# of stalls	Peak Trips	# of stalls
Recycle	Traditionals	4,035	19.8	---	2.3	17.5	9	1	12	1	12	2	13	2	27	3	39.4	---	4.5	34.9	36	3	45	4	46	4	48	5	67	6
	metals	4,401	21.6	216.1	6.2	15.4											43.0	430.3	4.9	38.1										
Reuse	Reuse	3,342	16.0	127.7	2.3	13.7	2	1	3	1	3	1	4	1	4	1	12.3	98.0	1.8	10.5	3	1	4	1	4	1	4	1	5	1
Tip	CDL (self-haul)	46,763	52.1	173.7	8.9	43.2	6	2	8	2	8	2	9	2	14	3	31.9	106.2	5.5	26.4	5	1	6	2	6	2	7	2	11	3
	Rec/Reuse Waste	10,396	46.6	266.5	0.0	46.6											83.5	477.1	0.0	83.5										
	Garbage (self-haul)	16,994	404.7	2,312.3	0.0	404.7	47	10	63	13	64	13	70	15	98	20	272.4	1,556.7	0.0	272.4	48	10	61	13	61	13	64	13	91	19
	Garbage (collected)	101,651	421.8	1,405.9	0.0	421.8	18	3	23	3	24	3	26	4	23	3	166.1	553.7	0.0	166.1	13	2	16	2	16	3	17	3	13	2
	Organics (self-haul)	7,200	38.0	253.6	38.0	0.0	9	2	12	3	12	3	13	3	18	4	47.2	314.5	47.2	0.0	13	3	17	4	17	4	18	4	28	6
	Organics (collected)	21,000	120.7	536.6	120.7	0.0	2	1	3	1	3	1	3	1	4	1	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0
Recyce/Reuse (no waste) =>		**11,779**	**57**	**344**	**11**	**47**	**11**	**2**	**15**	**2**	**15**	**3**	**17**	**3**	**31**	**4**	**95**	**528**	**11**	**83**	**39**	**4**	**49**	**5**	**49**	**5**	**52**	**6**	**72**	**7**
Total Waste (no organics) =>		**165,408**	**879**	**3,892**	**9**	**870**	**71**	**15**	**94**	**18**	**95**	**18**	**105**	**21**	**135**	**26**	**470**	**2,217**	**5**	**465**	**65**	**13**	**83**	**17**	**83**	**18**	**88**	**18**	**115**	**24**
Organics =>		**28,200**	**159**	**790**	**159**	**0**	**11**	**3**	**15**	**4**	**15**	**4**	**17**	**4**	**22**	**5**	**47**	**315**	**47**	**0**	**13**	**3**	**17**	**4**	**17**	**4**	**18**	**4**	**28**	**6**
TOTAL INCOMING =>		**205,387**	**1,095**	**5,026**	**178**	**916**	**94**	**20**	**124**	**24**	**126**	**25**	**138**	**28**	**188**	**35**	**612**	**3,059**	**64**	**548**	**117**	**20**	**149**	**26**	**150**	**27**	**159**	**28**	**215**	**37**
Reocurring Waste =>		**10,396**	**47**	**267**	**0**	**47**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**83**	**477**	**0**	**83**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TIP BUILDING TOTAL =>		**204,004**	**1,084**	**4,949**	**168**	**916**	**82**	**18**	**109**	**22**	**110**	**22**	**121**	**25**	**157**	**31**	**601**	**3,008**	**53**	**548**	**78**	**16**	**100**	**21**	**101**	**22**	**106**	**22**	**143**	**30**

SRDS - 2030 Summary

			Weekday Summary														Weekend Summary													
Recycle Area	Material	Annual Tonnage	Incoming Quantities tons	Incoming Quantities volume (CY)	Recovered tons	Disposed tons	Daily Trips	# of stalls	90% Trips	# of stalls	95% Trips	# of stalls	100% Trips	# of stalls	Peak Trips	# of stalls	Incoming Quantities tons	Incoming Quantities volume (CY)	Recovered tons	Disposed tons	Daily Trips	# of stalls	90% Trips	# of stalls	95% Trips	# of stalls	100% Trips	# of stalls	Peak Trips	# of stalls
Recycle	Traditionals	6,194	30.4	---	11.2	19.2	12	2	16	2	17	2	18	2	37	4	60.6	---	22.3	38.3	49	5	62	6	62	6	66	6	92	8
	metals	5,347	26.2	262.5	16.3	10.0											52.3	522.7	32.4	19.9										
Reuse	Reuse	8,182	39.1	312.5	5.1	34.0	6	2	8	2	8	2	9	2	10	2	30.0	240.0	3.9	26.1	7	2	9	2	9	2	10	3	12	3
Tip	CDL (self-haul)	38,024	262.8	876.1	168.1	94.7	26	6	35	7	35	8	39	8	63	13	164.8	549.4	105.4	59.4	22	5	28	6	28	6	30	6	50	11
	Rec/Reuse Waste	13,695	63.2	361.2	0.0	63.2											84.3	481.6	0.0	84.3										
	Garbage (self-haul)	17,790	150.3	859.0	0.0	150.3	23	5	31	7	31	7	35	7	38	8	115.5	659.8	0.0	115.5	29	6	36	8	37	8	39	8	45	9
	Garbage (collected)	314,678	1,309.5	4,365.0	0.0	1,309.5	47	6	60	8	61	8	66	9	61	8	514.2	1,713.9	0.0	514.2	36	5	46	6	46	6	50	7	36	5
	Organics (self-haul)	7,200	38.0	253.6	38.0	0.0	9	2	12	3	12	3	13	3	18	4	47.2	314.5	47.2	0.0	13	3	17	4	17	4	18	4	28	6
	Organics (collected)	21,000	120.7	536.6	120.7	0.0	2	1	3	1	3	1	3	1	4	1	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0
Recyce/Reuse (no waste) =>		**19,722**	**96**	**575**	**33**	**63**	**18**	**4**	**24**	**4**	**25**	**4**	**27**	**4**	**47**	**6**	**143**	**763**	**59**	**84**	**56**	**7**	**71**	**8**	**72**	**8**	**76**	**9**	**104**	**11**
Total Waste (no organics) =>		**370,491**	**1,723**	**6,100**	**168**	**1,555**	**96**	**17**	**126**	**22**	**128**	**23**	**140**	**24**	**161**	**29**	**794**	**2,923**	**105**	**689**	**86**	**16**	**110**	**20**	**110**	**20**	**119**	**21**	**131**	**25**
Organics =>		**28,200**	**159**	**790**	**159**	**0**	**11**	**3**	**15**	**4**	**15**	**4**	**17**	**4**	**22**	**5**	**47**	**315**	**47**	**0**	**13**	**3**	**17**	**4**	**17**	**4**	**18**	**4**	**28**	**6**
TOTAL INCOMING =>		**418,414**	**1,977**	**7,465**	**359**	**1,618**	**126**	**24**	**165**	**30**	**168**	**31**	**184**	**32**	**230**	**40**	**984**	**4,000**	**211**	**773**	**155**	**26**	**198**	**32**	**199**	**32**	**212**	**34**	**262**	**42**
Reocurring Waste =>		**13,695**	**63**	**361**	**0**	**63**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**84**	**482**	**0**	**84**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TIP BUILDING TOTAL =>		**412,386**	**1,945**	**7,251**	**327**	**1,618**	**108**	**20**	**141**	**26**	**143**	**27**	**157**	**28**	**183**	**34**	**926**	**3,719**	**153**	**773**	**99**	**19**	**127**	**24**	**127**	**24**	**137**	**25**	**158**	**31**

Private - 2030 Daily Tonnage and Trips

Recycle Area	Material	Annual Tonnage
	Garbage	0
	Organics	0

Year 2030 Self-Haul Tonnage

Material		Incoming RDS Self-Haul Tonnage					Material Flow			
Group	Type		NRDS		SRDS		NRDS		SRDS	
		Total	Lg Trucks	Trucks/Cars	Lg Trucks	Trucks/Cars	recovered	disposed	recovered	disposed
Garbage	Other	47,124	4,677	17,524	4,677	20,247	---	66,095	---	49,031
Paper	Newspaper	269	7.0	108.6	7.0	145.9	30.3	85.3	42.7	110.3
	OCC/Kraft	3,606	94.0	1,477.4	94.0	1,940.2	199.5	1,372.0	1,682.3	351.9
	Mixed Low Grade	2,100	53.7	599.5	53.7	1,392.6	99.5	553.7	240.1	1,206.2
Plastics	Bottles/tubs	456	11.7	137.1	11.7	295.4	41.1	107.7	92.1	215.0
	Film/bags	1,149	30.8	677.0	30.8	410.4	0.0	707.7	220.6	220.6
	Polystyrene Insulation	331	8.6	129.5	8.6	184.5	0.0	138.2	0.0	193.1
	Tyvek	2	1.1	0.0	1.1	0.0	0.0	1.1	0.0	1.1
	Fib'glass Ceiling Panel	38	18.9	0.0	18.9	0.0	0.0	18.9	0.0	18.9
Glass	mixed	555	14.9	345.4	14.9	179.3	112.3	248.1	63.1	131.1
	other glass	2,324	59.0	560.6	59.0	1,645.2	15.7	604.0	47.7	1,656.5
Metals	Alum. Cans	74	1.9	30.3	1.9	39.4	9.1	23.1	12.4	28.9
	Other Aluminum	191	5.0	90.5	5.0	90.8	0.0	95.5	0.0	95.9
	Other non- ferrous	177	4.5	35.5	4.5	132.1	2.1	37.8	8.2	128.4
	Tin food cans	87	2.2	22.0	2.2	60.8	12.8	11.5	36.6	26.5
	Other ferrous	4,754	125.2	2,286.0	125.2	2,217.5	1,335.0	1,076.2	2,096.8	246.0
	Mixed Metals	5,003	130.0	1,937.2	130.0	2,806.2	0.0	2,067.1	1,321.3	1,614.9
	Galvanized Steel	153	76.7	0.0	76.7	0.0	0.0	76.7	57.5	19.2
	Insulated wire/cable	34	17.0	0.0	17.0	0.0	0.0	17.0	4.2	12.7
Reuse	Furniture	8,145	209.5	2,609.9	209.5	5,116.0	391.5	2,427.9	532.5	4,792.9
	Mattresses	3,145	79.0	530.1	79.0	2,456.8	106.0	503.1	507.2	2,028.7
	Small appliances	854	21.7	202.2	21.7	608.7	30.3	193.5	63.0	567.4
	Large appliances	60	30.2	0.0	30.2	0.0	0.0	30.2	1.5	28.7
CDL-Wood	Dim Lumber	19,693	523.8	10,761.3	523.8	7,884.0	1,937.0	9,348.1	7,239.2	1,168.7
	Untreated Other	1,869	48.2	626.9	48.2	1,145.4	112.8	562.2	802.0	391.5
	Demo/mixed Lumber	5,968	155.8	2,516.4	155.8	3,140.1	452.9	2,219.3	2,214.8	1,081.1
	Treated	16,379	437.9	9,515.7	437.9	5,987.9	1,712.8	8,240.8	5,005.7	1,420.1
	Pallets and Crates	2,459	64.5	1,101.4	64.5	1,228.8	198.3	967.6	1,179.5	113.8
CDL-Other	New Gypsum	8,430	230.1	6,117.7	230.1	1,852.3	1,835.3	4,512.5	624.7	1,457.7
	Composite roofing	1,960	51.7	971.4	51.7	884.7	806.3	216.9	777.2	159.2
	Aggregate/Brick	5,452	142.5	2,321.0	142.5	2,846.5	0.0	2,463.5	0.0	2,988.9
	Mattresses	3,145	79.0	530.1	79.0	2,456.8	0.0	609.1	1,267.9	1,267.9
	Carpet	8,231	219.9	4,747.2	219.9	3,043.8	0.0	4,967.2	1,631.9	1,631.9
Total Tonnage (Annual)		151,072	7,554	67,982	7,554	67,982	**9,441**	**110,599**	**27,773**	**74,407**
Yard Waste	Yard Waste only	15,000	300	7,200	300	7,200	**7,500**	**0**	**7,500**	**0**

effective recycle rates

Material	NRDS	SRDS
Traditionals	11.50%	36.79%
Metals	28.53%	61.95%
Reuse	14.33%	12.96%
CDL	17.14%	63.97%

12.5% **<= % recycled at NRDS (excluding Yard Waste)**
36.8% **<= % recycled at SRDS (excluding Yard Waste)**
24.6% **<= % recycled/reused Systemwide (excluding Yard Waste)**

Summary of Vehicle Distributions and Peak Factors

Vehicle Type	average tons/trip weekday	weekend	% distribution avg annual weekday tonnage	weekend tonnage	Distribution (tonnage)	Monthly Peak % of annual	% peak month distribution weekday tonnage	weekend (tonnage)	Weekday Peak trip Factor	Weekend Peak trip Factor
Rec-car	0.05	0.03	48.9%	51.1%	12.5%	0.0%	3.39%	3.56%	3.4	1.86
Rec-truck	0.46	0.38	48.8%	51.2%	87.5%	8.0%	3.39%	3.56%	2.48	1.96
G-car	0.189	0.189	52.6%	47.4%	4.2%	27.2%	3.52%	3.44%	1.79	1.42
G-truck	0.510	0.334	77.3%	22.7%	95.8%	17.6%	3.52%	3.44%	1.61	1.59
WW-car	0.100	0.100	54.3%	45.7%	0.55%	102.8%	3.52%	3.89%	3.21	3.51
WW-truck	0.505	0.391	82.6%	17.3%	99.45%	41.6%	3.53%	3.67%	2.8	2.93
YW car	0.129	0.129	49.8%	50.2%	5.05%	68.0%	3.14%	3.46%	2.82	2.32
YW truck	0.278	0.239	68.4%	31.6%	94.95%	34.4%	3.14%	3.47%	1.99	2.03
Lg Trucks	4.22	4.22	77.3%	22.7%	100.0%	17.6%	3.52%	3.44%	1.61	1.59
Org-Res (curb)	6.51	6.81	100.0%	0.0%	100.0%	59.0%	4.65%	0%	1.54	0%
Org-Com	7.0	7.0	100.0%	0.0%	100.0%	0.0%	4.65%	0%	1.2	0%
Res-Coll-Garb	6.94	6.26	83.3%	16.7%	100.0%	9.0%	3.88%	0.77%	1.3	1
Com-Coll-Garb	5.86	5.41	83.3%	16.7%	100.0%	7.0%	3.88%	0.77%	1.28	1
transfer trucks	28	28	76.3%	23.7%	100.0%	80.0%			1.2	1.2
OD Garbage	7.0	7.0	83.3%	16.7%	100.0%	7.0%	3.88%	0.77%	1.28	1
OD CDL	2.75	2.75	83.3%	16.7%	100.0%	7.0%	3.88%	0.77%	1.28	1
OD YW	6.0	6.0	83.3%	16.7%	100.0%	7.0%	3.88%	0.77%	1.28	1

Assumptions:

1) data taken from Herrera traffic model developed for SPU in 2001 (original source - Heffron study 1999 - Table A-1)
2) 102 weekend days (closed 2 weekend days)
3) 258 weekdays (closed 3 weekdays on average)
4) 5 number of days station is closed to incoming traffic
5) 5 min - Stall unloading time for Customers with traditional recyclables
6) 12 min - Stall unloading time for Customers at tipping floor
7) 7.5 min - Stall unloading time for collected trucks
8) 40 sec - average inbound scale time all vehicles
9) 70 sec - average outbound scale time self-haul
10) 40 sec - average outbound scale time contract collected
11) 20 ft - average length on vehicle in queue

Adjusted Peak Factors for Existing Incoming Trip Conditions

100 % observations	All waste streams	Self Haul Only
weekday	1.405	1.494
weekend	1.358	1.355
Bottom 95% observations		
weekday	1.292	1.359
weekend	1.280	1.282
Bottom 90% Observations		
weekday	1.262	1.340
weekend	1.270	1.275

Assumptions:

1) data for Peaks provided by SPU (Jenny and Tiva on May 5, 2003)
2) "all waste stream" includes self haul and contractor trips
3) Peaking factors represent an average factor for all combined vehicle types

Material Composition and Recovery Rates for Each Commodity

	NRDS	SRDS		
Is there a Commingled Tipping Floor (no/yes) ?	No	yes	0	1
What type of recycling is @ RDS ?	Enhanced	Com Target		
What is the Reuse Facility (none, drop-off, or retail) ?	drop-off	retail		

Material		Composition			Recycle/Reuse Recovery Rates (for each facility type)								
Group	Type	NRDS Updated	SRDS Updated	Lg Trucks (NRDS/SRDS Combined)	NRDS (Enhanced)	SRDS (Com Target)	Existing	Enhanced	Small Com	Com Target	Dirty MRF	Reuse - Drop	Reuse - Retail
Paper	Newspaper	0.160%	0.2147%	0.185%	27.9%	27.9%	27.9%	27.9%	27.9%	27.9%	38.7%		
	OCC/Kraft	2.173%	2.8540%	2.488%	13.5%	82.7%	13.5%	13.5%	65.4%	82.7%	82.7%		
	Mixed Low Grade	0.882%	2.0485%	1.422%	16.6%	16.6%	16.6%	16.6%	16.6%	16.6%	29.1%		
Plastics	Bottles/tubs	0.202%	0.4345%	0.310%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	86.0%		
	Film/bags	0.996%	0.6037%	0.814%	0.0%	50.0%			50.0%	50.0%	50.0%		
	Polystyrene Insulation	0.191%	0.2714%	0.228%	0.0%	0.0%					50.0%		
	Tyvek			0.030%	0.0%	0.0%					20.0%		
	Fiberglass Ceiling Panel			0.500%	0.0%	0.0%					50.0%		
Glass	mixed	0.508%	0.2638%	0.395%	32.5%	32.5%	32.5%	32.5%	32.5%	32.5%	73.0%		
	other glass	0.825%	2.4200%	1.563%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%		
Metals	Alum. Cans	0.045%	0.0580%	0.051%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	86.0%		
	Other Aluminum	0.133%	0.1336%	0.133%	0.0%	0.0%					80.0%		
	Other non- ferrous	0.052%	0.1943%	0.118%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	81.2%		
	Tin food cans	0.032%	0.0894%	0.059%	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%	95.8%		
	Other ferrous	3.363%	3.2619%	3.316%	58.4%	89.5%	58.4%	58.4%	70.0%	89.5%	95.0%		
	Mixed Metals	2.850%	4.1278%	3.441%	0.0%	45.0%				45%	65%		
	Galvanized Steel			2.030%	0.0%	75.0%				75%	80%		
	Insulated wire/cable			0.450%	0.0%	25.0%				25%	35%		
Reuse	Furniture	3.839%	7.5255%	5.546%	15.0%	10.0%						15%	10%
	Mattresses	0.780%	3.6139%	2.092%	20.0%	20.0%						20%	20%
	Small appliances	0.297%	0.8954%	0.574%	15.0%	10.0%						15%	10%
	Large appliances			0.800%	5.0%	5.0%						5%	5%
CDL-Wood	Dim Lumber	15.830%	11.5972%	13.870%	18.0%	86.1%	18.0%	18.0%	86.1%	86.1%	90.2%		
	Untreated Other	0.922%	1.6848%	1.275%	18.0%	67.2%	18.0%	18.0%	67.2%	67.2%	67.2%		
	Demo/mixed Lumber	3.702%	4.6189%	4.126%	18.0%	67.2%	18.0%	18.0%	18.0%	67.2%	67.2%		
	Treated	13.997%	8.8081%	11.594%	18.0%	77.9%		18.0%	18.0%	77.9%	77.9%		
	Pallets and Crates	1.620%	1.8076%	1.707%	18.0%	91.2%		18.0%	18.0%	91.2%	87.7%		
CDL-Other	New Gypsum	8.999%	2.7247%	6.094%	30.0%	30.0%		30.0%		30.0%	51.0%		
	Composite roofing	1.429%	1.3013%	1.370%	83.0%	83.0%		83.0%	83.0%	83.0%	83.0%		
	Aggregate/Brick	3.414%	4.1871%	3.772%	0.0%	0.0%					40.0%		
	Mattresses	0.780%	3.6139%	2.092%	0.0%	50.0%				50%	70%		
	Carpet	6.983%	4.4774%	5.823%	0.0%	50.0%				50.0%	80.0%		
		10%	29%	33%									

Average Densities

Traditionals	not needed			
metals	200 lbs/CY	0.1 tons/CY		
Reuse	250 lbs/CY	0.125 tons/CY	(mix of metals, wood, garbage type tonnages)	
CDL	600 lbs/CY	0.3 tons/CY	(260 wood, 450 gypsum, 1000 comp roofing, 1500 aggregate mix)	
Garbage (Misc) - Self Haul	350 lbs/CY	0.175 tons/CY		
Garbage - Collected	600 lbs/CY	0.3 tons/CY		
Yard Waste	300 lbs/CY	0.15 tons/CY		
Food Waste	850 lbs/CY	0.425 tons/CY		
Commingled YW/FW	450 lbs/CY	0.225 tons/CY	(approx 4:1 ratio)	

Input Parameters for SEPA Evaluation -

% large trucks for SH garbage	10%
% large trucks with SH YW	4%
% large SH trucks to RDS with CDL	50%

Material and Delivery type	Generated Tonnage 2008	2012	2020	2030	Tonnage Split NRDS	SRDS	IMF	Private
Residential Garbage	131,210	135,013	144,299	154,986	15%	85%	0%	0%
Commercial Garbage	201,490	205,235	230,130	261,342	30%	70%	0%	0%
Self Haul - Total								
SH & OD Garbage Total	113,246	103,813	120,041	151,072				
Large Trucks	11,325	10,381	12,004	15,107	50%	50%	0%	0%
Trucks/Cars	101,921	93,432	108,037	135,965	50%	50%		
On Demand Garbage (in Packers)	0	0	0	0	50%	50%		
On Demand Recy (in FB Trucks)					50%	50%		
Self Haul Yard Waste	15,000	15,000	15,000	15,000				
Large Trucks	600	600	600	600	50%	50%	0%	0%
Trucks/Cars	14,400	14,400	14,400	14,400	50%	50%		
On Demand YW	0	0	0	0	50%	50%		
Residential Organics (YW/FW)	35,000	35,000	35,000	35,000	50%	50%	0%	0%
Commercial Organics (FW)	7,000	7,000	7,000	7,000	50%	50%	0%	0%
Total Check	350,200			433,828				
NRDS	165,252			205,687				
SRDS	337,695			418,714				
	502,946			624,400				

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