

III. CHIPPER SERVICES SECTION OF THE WASTE MANAGEMENT DIVISION

Although the Waste Management Division of Public Works provides a wide variety of services, because of the recently issued waste management plan the project team's scope of services was restricted to an analysis of the Chipper Service, or Brush Removal, Unit of the Division. The Chipper Service is responsible for the collection of curbside yard waste, both on an on-demand basis, as well as on a routine schedule.

The Chipper Service currently provides, through two private contractors, a residential brush removal service for citizens, using a combination of regular routes and on-demand pick-up. The City provides the equipment and has full time personnel assigned to supervise the operation. Although the Chipper Service has defined a service level of picking up brush a maximum of five times per year for each residence, this Section of the Waste Management Division of Public Works does not currently have the information system capability to ensure that this level of service is either attained, or not exceeded, for specific residences. Further, in the experience of the project team, a collection frequency of five times annually is a very high level of service, with two to three times per year being more typical.

The following issues have been identified in the Chipper Service Section of the Division of Waste Management.

1. **A CHANGE IN TYPE OF EQUIPMENT USED SHOULD RESULT IN A MORE EFFICIENT METHOD OF COLLECTION.**

The current method of collection of brush involves a two or three-person crew which follows a route within a particular zone of the County, and loads brush into a chipper which feeds chipped material into boxes mounted on trucks. Typically, these crews are able to complete two such 3.7 ton loads per day. After completing a load, the chipped material is taken to a

compost dump site at Bordeaux. Depending upon the location of the zone, transporting the chipped material can take up to 30 to 45 minutes one-way.

The Waste Management Division Manager has recently made a decision to alter the manner in which brush is collected. This change will entail purchasing a series of mobile “grapple arms” which will be capable of collecting curbside debris, then loading the debris into 30 yard boxes loaded onto dump trucks. Once a dump truck is fully loaded, it will transport the debris to the Bordeaux compost site and will be replaced by another dump truck, allowing uninterrupted collection of curbside brush by the grapple arm. This altered method will greatly increase productivity of the chipper crews, and result in a quantifiable cost saving to Metro, as is shown in the table below. In developing the cost savings table, the project team reviewed a six-month sample of activity as reported by the Chipper Service for a single crew utilizing the new grapple arms, or “knuckleboom” trucks, which operate in tandem with two trailers capable of hauling brush. The data reported by this single route are as follows:

- There were 2,754 “stops” made on regular routes.
- There were 524 stops made as a result of “call in” requests. Combined with the stops made on regular routes, this yields 3,278 total stops made in the 6 month period.
- There were 328 tons of debris collected on the 3,278 stops, resulting in about 0.1 tons, or 200 pounds, of brush collected per stop.
- Assuming 120 work days in the 6 months, there was an average of 27.3 stops per day. At 10 hours per day (crew members work four 10 hour days per week), this results in an average of 2.73 stops per hour.
- Observations by the project team indicate that about 1.5 hours per day are expended by crews using the current chipper truck method of collection in the transport of brush to the Bordeaux brush landfill. This results in the ability of the new knuckleboom method of collection to result in approximately 4.1 more stops per day than is possible under the current collection method.

- Given that about 200 pounds are collected per stop, crews using the knuckleboom-trailer combination can collect approximately 820 pounds per day more than is currently the case with the chipper trucks.

To complete the comparative cost calculation, the project team obtained vehicle repair and maintenance costs for the chippers and service trucks which transport them. There are no available repair and maintenance data for knucklebooms and trailers, as these are relatively new, and are under warranty, at any rate. Additionally, the project team obtained purchase costs for all equipment in the analysis, and has calculated an annual depreciation amount for each piece of equipment, based on projected economic lives of the machinery. These data, as well as the information provided in the bullet points above, are incorporated into the table below.

Comparative Costs of Alternate Brush Collection Methods

Element	Current Chipper Truck Method	Alternate Grapple Arm Method
Number of crews system-wide	20	18
Tons collected system-wide	11,480	11,480
System-wide equipment maintenance and depreciation cost	\$236,029	\$281,604
Personnel costs	\$1,302,787	\$1,172,508
Total Cost of Method	\$1,538,816	\$1,454,112

The above table indicates that the overall cost of the proposed method is about \$85,000 less expensive as a result of greater production output by crews utilizing the new method. This model is based on an assumption of the same level of collection volume with fewer crews as the basis for the cost savings estimate.

It should be noted that Waste Management Division managers report that a greater number of tons are possible to be collected per day using the new grapple arm method than is shown in the table above. This may in fact be the case. However, there are several non-static variables involved in the analysis of the two alternate service delivery methods. One such

variable, which may account for much of the difference, is the reported greater level of efficiency and productivity of contract crews as a result of more intensive management controls than have been in place in prior years. The project team does not disagree that this variable may contribute greatly to the overall greater number of tons collected, however, for purposes of presenting comparative calculations, it was assumed that greater management oversight would have contributed to higher productive levels using the old collection method by chipper trucks. At any rate, there is a finite number of tons for collection under any alternative collection scenario. The value of the calculation presented in the table is in the identification that, as the number of crews is reduced under the new method, the greater is the cost savings attributable to the service delivery method. The table makes the assumption that it is possible to make a reduction of two crews. This number was derived by equating the tonnage collected between the two methods, and determining the number of resources which would be expended under each of the two methods, considering that one method (the current chipper truck method) requires 1.5 hours per day in transportation downtime hauling brush to Bordeaux.

Recommendation 3-1. The project team recommends that the Division convert its chipper service to a fleet based on combining grappler trucks in tandem with trailers. We estimate that the annual cost savings for this change will be at least \$85,000 per year, assuming the same volume of collection.

2. THE WASTE MANAGEMENT DIVISION SHOULD ALTER ITS METHOD OF SERVICE DELIVERY FOR THE CHIPPER SERVICE.

The current procedure for brush pick-up is for citizens to call in with a request, and the Chipper Service Section informs the caller that the brush must be at the curbside, and will be collected within three weeks. If the specific residence happens to be on one of the 20 regularly-scheduled routes for collection prior to that time, the debris will be collected at that time.

Otherwise, the brush will be collected within the three-week time frame. As brush is collected, the private contractor is instructed to pick up any other brush which is in the same general area.

One issue with the current service delivery method is that, as brush is collected from residences which have called in for “on-demand” service, the chipper trucks may, and reportedly frequently do, pass by several other residences which have placed brush at their curbsides without collecting this debris also. This practice is followed to ensure that the drivers are able to collect all on-demand brush at residences, as well as to proceed to their regularly-scheduled routes.

Metro has defined a high service delivery level in its chipper operation. To continue to provide this level of service, it is imperative that the Waste Management Division provide the most efficient routing of chipper trucks possible. Clearly, there are problems associated with the current method of service delivery, in that brush piles at the curbside are reportedly passed by as trucks continue on to scheduled locations. Further, it is apparent that Metro has not established clear policies regarding the limitations of sizes and locations of brush which will be collected, as the project team noted several incidents in which extremely large brush piles were placed at curbsides, creating a large, unplanned consumption of time on the parts of crews in feeding the brush into the chipper. In fact, one brush pile along Briley Parkway extended for over one-half mile.

The project team believes that cost savings are attainable through the elimination of the call-in service, as chipper trucks currently travel first to locations which are not on the regularly scheduled daily routes. Then, as these call-in collections are completed, the chipper trucks travel to the regular route sites and begin daily service. Although the call-in locations will be serviced

in due course, the travel times associated with arriving at these locations can be eliminated, as chipper crews will proceed directly to their regularly scheduled route locations. The cost savings associated with the elimination of the call-in service are between \$116,000 and \$232,000 annually, as the table below indicates.

**Cost Savings Attributable to the Elimination of the
Call-In Brush Collection Service**

Element	Number
Number of call-in collections made from 8/1/01 to 1/23/02 (20 routes)	7,366
Number of days on which brush collection occurred from 8/1/01 to 1/23/02	119
Average number of call-in collections made per route (8/1/01 through 1/23/02)	368.3
Average number of call-in collections made per crew per day (8/1/01 through 1/23/02)	3.1
Average cost per ton collected by private contractors (Avg. of Jan. and Feb., 2001 – from internal records)	\$638.78
Average number of tons collected per stop (see previous sub-section)	0.1 (or 200 lbs.)
Average cost per stop	\$63.88
Average number of stops per hour (see previous subsection)	2.73
Average collection cost per hour (\$63.88 * 2.73 stops per hour)	\$174.39
Number of routes system-wide	20
Total hourly cost of collection by private contractor (hourly cost * 20 (routes))	\$3,487.80
Number of collection days per year	200
Annual cost savings assuming 20 minutes of travel time daily to and from call-in collections	\$232,520
Annual cost savings assuming 10 minutes of travel time daily to and from call-in collections	\$116,260

Recommendation 3-2. The project team recommends that the Division alter its service delivery method to provide its chipper service strictly on a scheduled-route basis in order to facilitate the collection of curbside debris. The cost savings from this recommendation should be between \$116,000 and \$232,000 annually, as is shown above. Further, we believe that this recommendation will enable crews to be more effective in their work schedules and will reduce the number of public complaints about being “missed” by chipper crews.

It is commendable that the Waste Management Division has defined a high service level for its citizens by attempting to accommodate call-ins on a 30-day turnaround basis; however, this is resulting in unforeseen problems, not only in the passing of piles of brush on the way to brush which has been called in (resulting in citizen complaints that the service was originally

designed to avoid), but also in the interruptions of routes. Although call-ins are collected at the beginning of the day, prior to the commencement of regular routes, it is disruptive to crews who must “back-track” to sites in order to pick up at the point at which the regular route was stopped on the previous day.

Recommendation 3-3. Metro should establish regulations on the preparation of brush for pick-up and rigidly adhere to those standards. This will have no cost requirement, but will result in greater work productivity.

At present, Metro’s standards call only for brush being less than four inches in diameter and precludes commercially cut brush. Commercial firms are required to dispose of any brush they generate, but the project team’s observations of the chipper service lead us to believe that this is not uniformly the case. Most typically, communities require that the brush be trimmed, cut to maximum lengths, and bundled. Experiences of these jurisdictions indicate that such requirements simplify the collection process, enable a greater volume to be collected more quickly, and reduce the incentive for commercial firms to leave brush for City pickup; in this later instance, the Briley Parkway situation described earlier is a particular case in point. Typical standards include:

- Brush must be trimmed.
- All items should be cut to a maximum length of four to five feet, with three inch diameter maximum
- The items should be bundled with biodegradable rope or twine.

Implementation of these new standards will require considerable community education and the willingness of Metro to accept complaints and public criticism for not collecting brush that fails to meet these standards.