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# Recommendations of the Noise Review Board Subcommittee on Garbage Collection

## April 16, 2004

**Prepared by the Noise Control Office**
**For the Noise Review Board Garbage Sub-Committee**

### Subcommittee Members:

**Vallerie Hill**, -- Gruetter Sanitary Service
**Dean Kampfer**, -- Waste Management
**David McMahon**, -- Cloudburst Recycling
**Susan Pearce**, -- Citizen and Noise Review Board Member
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**Page Stockwell**, -- Citizen and NW Neighborhoods Representative
**Dave White**, -- Oregon Refuse and Recycling (Tri-City Council)

### City Staff:

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### Background:

### How did we arrive at this point?

In June of 2001 a task force created by the City Council, known as the Noise Control Task Force (NCTF), completed a set of general recommendations for improving community noise pollution concerns. The NCTF held public meetings from September 2000 to March 2001. In October 2000 the NCTF held public meetings throughout the City to help determine what the community priorities were in relation to noise pollution sources. Nighttime garbage collection was mentioned in all of the neighborhood meetings. The focus of the comments from citizens was that nighttime garbage collection was creating noise disturbances with the potential of waking citizens from a sound sleep.

In order to better evaluate the garbage truck concern, Lee Barrett of the Office of Sustainable Development, and the Noise Control Officer, Paul van Orden, reviewed the complaints filled with

the Noise Control Office. The average number of complaints filed with the City's Noise Control Hotline was at approximately 25 to 30 calls annually in the late 90's and into the year 2000. The calls had a clear pattern of being related to one particular type of garbage and recycling truck, namely the front-end loader vehicles. These are the vehicles that normally are used to lift the commonly-used 2 to 4 Yard containers over the cab of the truck and dump the material into an opening in the top of the truck. Mr. Barrett and Mr. van Orden set out to better qualify and quantify the sources of sound from the front end loader trucks. In cooperation with one of the haulers, City staff went out in the middle of the night to follow trucks around and take sound level measurements. The middle of the night was selected because of the reduced ambient sound levels that would help facilitate taking sound level measurements solely of the truck's noise and not of other community noise sources.

The general protocol was that Mr. Barrett would run up to the front load style truck as the driver set up to pick up the dumpster. A measurement was taken at 25 feet to standardize the sound level measurements. Mr. van Orden would stand at the 25 foot mark and take hand held sound level measurements and make general notes of the specific sources of noise. The work helped the Noise Office and the Office of Sustainable Development determine the primary area of concern for noise mitigation.

The first area for potential improvement was general truck operator practices. It was clear that a skilled operator had the ability to more carefully, and at a less hurried pace, dump the trash or recyclables in a notably quieter fashion. In a number of cases the improvement was noted to be as great as 8 to 10 decibels (using a dBA measurement). A change of 10 decibels is perceived to be a doubling of the sound level by a person of average hearing sensitivity.

The dumpster itself was seen as a significant source because of its ability to act like a giant drum and to permit sound to resonate into the community. City staff made general observations about the dumpsters. After evaluating a number of different parameters, a few specific areas of concern rose to the top of the list.

The use of metal containers and metal lids were noted to be a concern. The metal to metal contact can be compared to giant drums when excited by the hammering of debris or recycling or from the lids and lid props on the metal containers. However, in many cases the use of plastic lids or potentially all-plastic dumpsters is not a feasible solution, due to a requirement from the Fire Marshal's Office that all-metal containers be used in most dense urban neighborhoods to limit the risk of fire to adjoining structures.

The second area for improvement on the dumpsters was treating a little metal bar found inside the dumpsters that is attached at one end and can pivot. It is used to prop up the lids to make it easier to empty indoor containers into the dumpster. When the dumpster is raised by the truck forks, this little metal bar was noted to swing down and strike the dumpster wall and lid right at the point when the dumpster reached the apex point over the top of the garbage truck.

The third area on the dumpster to explore mitigation options was the fork pocket. This is the slot on the dumpster where the front loader forks are inserted to enable the motion of lifting. It is a problem because the forks on the truck are metal and the container lifting pockets on the sides are also metal. This is a significant source of banging and instantaneous crashing noise which a has a clear potential to wake neighbors from a sound sleep. This particular noise offers two separate opportunities for

noise mitigation. One option is treating the dumpster, and the second option is treating the actual forks on the trucks.

Another concept that is tied to creating a set of best practice policies for the operators of the trucks was the concept of installing a regulator that would keep the driver from revving the engine too fast during a dumping operation. It has already been noted above that operators who rush the lifting operation create excessive noise. One additional option, separate from operator training, is to install a governor device that regulates the speed at which a driver can perform the lifting operation, or possibly to install a low speed, high volume hydraulic pump for the lifting apparatus on trucks operating at night. The low speed, high volume pumps build the pressure needed to operate the lift mechanism without the need for an operator to run the engines up to such high revolution per minute (RPM's). This technology would also have the added benefit of improving the fuel economy on the trucks. Unfortunately, this type of mechanism is still in the development stages and is not yet readily available to the hauling industry.

On July 11, 2001 the Portland City Council approved the general body of work from the NCTF. The recommendations became effective August 1, 2001 and included recommendations related to the need for further study on the issue of nighttime garbage collection. The recommendations focused on the need for further study to ultimately develop a set of regulations or requirements for nighttime collection in the City of Portland. The Task Force determined that with the time they had available to cover a broad spectrum of community noise concerns, the issue related to garbage trucks would need more time to develop noise mitigation and abatement strategies.

The initial set of recommendations created by the eight member volunteer task force included the option of looking into commercial franchising to help alleviate the noise impact of nighttime garbage collection. Commercial franchising would result in only one company serving any given neighborhood or region. The Task Force had seen franchising as a good option for dealing with the more dense urban neighborhoods where multiple garbage trucks and different companies may collect trash and recycling material throughout the night. The NCTF had felt that franchising could address the community comments that one could get woken up multiple times throughout the night, as a variety of companies worked to serve different commercial accounts. In reviewing the NCTF recommendations, City Council made it clear that they were not interested in addressing franchising at this time.

On July 11, 2001 the Council approved the set of recommendations from the NCTF with a only a few amendments, including an amendment to recommendation 7.4 of the section on garbage and recycling collection noise. This change moved the dialog on franchising in a more general direction. The new direction put the focus on City staff to work to develop technological and logistical solutions to address the impact on the community of multiple garbage truck trips on a single street .

A copy of the final approved recommendations from the Noise Control Task Force recommendations (dated July 11, 2001) related to the section on "Garbage and Recycling Collection" can be found on the web at www.portlandonline.com/oni/ At the opening page for ONI or the Office of Neighborhood Involvement, select the link to Noise Control found under the Neighborhood Services link at the top of the page.

## Technological Solution Reports:

In the process of staff working to address the potential solutions to the problem of night garbage and recycling collection, two possible technological solutions were identified as the most promising options. These two solutions included the idea of developing a material to fit over the garbage truck forks to shield the forks from the metal to metal contact. This particular source of noise was identified by City staff as a significant source of the garbage and recycling collection noise disturbing the community. The other potential solution related to exploring ways to quiet down the noise associated with an average 3 to 4 yard waste or recycling container.

The Office of Sustainable Development and the Noise Control Office, which was housed in the Bureau of Development Services at that time, were able to put together a modest $12,000 to undertake a small engineering study to develop solutions to these two potential areas for noise mitigation. Through a Request for Proposal process, acoustical engineering firm Daly Standlee and Associates was hired to do some basic analysis and design work to address these two concerns.

The result of their work culminated in two separate reports in the Fall of 2003 respectively titled: *Investigation of Dumpster Noise Controls*, and *Investigation of Garbage Truck Fork Noise Control Treatment.* These two documents helped offer the sub-committee additional direction in their decision making process. These two documents are available on the internet at www.portlandonline.com/oni/ They are on the Portland Noise Control web pages found under the main ONI website.

## Recommendations of the Sub Committee

The Noise Review Board Subcommittee on Garbage Collection has studied the issue of technological fixes for nighttime garbage collection noise as directed by Council in 2001. This subcommittee includes two members of the NRB, four hauler representatives, and a representative appointed by the NW District Association. The subcommittee came up with final recommendations at its March 24, 2004 meeting.

The subcommittee decided that a few solutions should be applied to all haulers and other solutions would be administered only when complaints were received. Additionally, some solutions may not be available at this time and will need to continue to be explored and researched as time goes by.

## The subcommittee's recommendations are as follows:

### Apply to all haulers

- Driver best practices training. This training would apply to all drivers/companies who collect garbage or recycling at night. OSD has put out a Request for Proposal to provide this training but did not receive any responses. The City should continue to work on this approach, since driver behavior is the single most-important factor in noise generation in many instances.
- Full implementation of smart or quiet back-up alarms (back up beepers). This recommendation was adopted in OSD's regulations effective July 1, 2002 for any truck that operates at night. A smart alarm senses the level of ambient noise and adjusts appropriately. In quiet neighborhoods the alarm beeps at much quieter sound levels to limit the disturbance of near by residences.

- Public notification of complaint process and related issues. The City needs to find creative ways to educate the public about their options for having nighttime disturbances from garbage and recycling collection addressed.

The subcommittee considered requiring haulers to treat all dumpsters with sound-deadening material, and determined that this would impose a significant cost. There are thousands of dumpsters that may be in use at night throughout the City. OSD identified approximately 11,700 that might be in use on any given night.

The sub-committee focused its attention on the idea of developing a system of responding to the location where an actual compliant is received, instead of mandating that all dumpsters or trucks be treated. Since there are fewer trucks than dumpsters, the subcommittee also looked at modifications to the trucks, pumps, or forks. OSD staff surveyed haulers who responded that there are approximately 74 front loader style trucks that might be operating on any given night in the City of Portland.

The system the Garbage Sub Committee envisioned was one that is administered jointly by the staff in OSD and ONI Noise Control. A few questions have still been left unaddressed and have been noted in the corresponding recommendation item. There is also clearly a need for Council to address the impact that this program would have on the very limited resources in the form of staffing currently available to the Noise Office (ONI staff) and the Office of Sustainable Development .

**Apply when complaints are received**

1. Individual case review by OSD and ONI to solve unique cases. There are some unresolved issues for this approach, for example, Who pays the costs of recommended/required changes? The hauler or the entity contracting the hauler's services, or both?

2. Hours of glass collection restrictions. If a complaint is received regarding glass collection at night, the glass collection will need to occur during the day. This recommendation was adopted in OSD's regulations effective Sept. 2, 2002.

3. Treat lid supports with a sound-deadening coating. This recommendation was adopted in OSD's regulations effective Sept. 2, 2002.

4. Treat the containers with sound-deadening material.

***(Daly-Standlee Study)*** A majority of complaints received were regarding large dumpster pickup. When the garbage trucks were followed, certain materials in the garbage bin made the dumping operations louder. That was especially true when the truck was empty. There was less noise when the truck already contained more material. The Task Force focused on the dumpster itself since the truck was not consistently waking people up according to the record of complaints. The Bureau of Development Services and the Office of Sustainable Development (OSD) put out a bid to hire an acoustical firm to study two primary areas for improvement. The first issue was to mitigate noise by treating the dumpster with the most effective method from both an acoustical and cost perspective. Daly-Standlee & Associates, Inc. was hired to conduct the study. 3-yard dumpsters were tested and it was determined that vibration damping would be the most cost effective approach.

A vibration sensor, or accelerometer, was used to measure the vibration response at a number of strategic points on the containers. The side panels had the most noise; the bottom panels had very

little noise. 9 x 9 inch square patches were added in stages to the inside of the bin. Adding patches to the outside of the bin would be equally effective and those outside patches could be painted. Patches were added until a 5 dB reduction was achieved since 5 dB is considered a noticeable improvement.

The patches made the metallic, crashing sounds noticeably less harsh. The estimated cost from the consultant to treat a 3-yard bin is $103. It is estimated to cost $132 to treat a 4-yard bin.

Alternatives to the patches tested include other sheet materials or a spray-on treatment. A spray-on treatment is not recommended. The life expectancy of the sheet material tested is at least a year. A 4-5 dB reduction will sound to an average person, the same as moving twice the distance from the original untreated dumpster. One of the key concerns of the industry is cost. With the size of the pieces being applied, it doesn't matter if it is placed on the exact spot; it just needs to be relatively close. The material was placed where there were the most vibrations according to the vibration analysis. The side had the most impact/energy. Measurements were taken at 50 feet from the dumpster.

5. Treat the forks with sound-deadening material.

The Sub Committee agreed with the consultants' impression that it was logical to request Council's support of staff or, more realistically, an outside entity to do more testing before making the fork treatment a requirement . ***(Daly-Standlee Study noted above for Fork treatment)*** The second issue for Daly-Standlee & Associates, Inc. was to design a treatment of the forks with an adequately long lasting material. The forks are a significant source of the crashing sound. Since the noise mainly occurs when the fork tip impacts the back pocket of the dumpsters, they determined that they didn't need to treat the whole fork. The garbage trucks handle 1 yard to 6 yard dumpsters. This research addressed 3 and 4 yard dumpsters that have pockets on the side of the dumpster. Trucks have various designs of forks. The fork treatment was not tested over a long period of time and may work for only one type of dumpster, not all types. For smaller dumpsters, material attached to the folks would need to be placed farther back on the fork. They may also have to put something in between the forks. The fork treatment would require drilling holes in the edge of the fork and bolting the treatment on.

It is estimated to cost $170 to $180 per truck to treat the forks. As noted on the previous page, OSD's hauler survey counted about 74 front loader trucks that might need to be treated. The results of the testing showed that further testing is clearly needed before fork treatments can be required in some instances as a mitigation tool.

6. Use plastic lids or plastic dumpsters, where the Fire Marshal will allow their use.

7. Change collection hours and/or location of garbage/recycling containers.

8. Add new technologies as they become available. Some possibilities include low rpm, high output pumps; or pumps with speed control; or engine rpm, throttle limits.

**Research**

Research new technologies that may help mitigate nighttime noise related to garbage collection. Pumps would fall into this category. Financial support is needed from Council for researching these new technologies.

**Other Options**

Council decided in 2001, as a result of the work of the Noise Task Force, that there would be neither franchising nor a ban on nighttime collection. The garbage subcommittee determined that both franchising and a nighttime collection ban may need to be considered later if the other recommended options do not produce satisfactory results. The noise impacts are only one factor in exploring either option. All factors need to be considered prior to moving forward with either of these options. Currently, the time of day when pick up occurs is a customer service issue.

Haulers have stated that they are trying to balance noise, safety, traffic congestion, and service cost. Mitigation won't solve all complaints. All of the members of the sub committee seemed to be in agreement on the fact that that the solutions suggested were geared at finding a balance for both the residents and the business community.

Note: an earlier copy of this document was presented to the City's Noise Review Board at their April 14, 2004 meeting. A few typographic errors and minor changes have been made to this final version which carries a new date of April 16, 2004 on the top page