



King County

Transportation, Economy and Environment Committee

STAFF REPORT

Agenda Item:	6	Name:	Mike Reed
Proposed No.:	2011-B0033	Date:	March 29, 2011
Invited:	Kevin Kiernan, Director, Solid Waste Division		

SUBJECT

Presentation by the Solid Waste Division of the "Portable Weight Scales Report" in response to Council Motion 13323.

SUMMARY

The Solid Waste Division has completed the report addressing the potential for use of portable truck/trailer weight scales at solid waste transfer stations, in response to Council Motion 13323. The report cites issues of cost, staffing requirements, transfer station size and configuration constraints, and similar challenges associated with available portable and weigh-in-motion scale systems, in recommending against acquisition of such systems for service at county solid waste transfer stations.

BACKGROUND

On August 19, 2010, the County Ombudsman completed a report addressing a whistleblower complaint concerning transfer of solid waste in truck trailers that are over state limits for vehicle weights. The Ombudsman's report addressed a concern raised by Solid Waste Division truck drivers, that Solid Waste division ("Division") truck trailer combinations that carry solid waste from County transfer stations to the County's Cedar Hills Regional Landfill, were sometimes loaded beyond the 98,000 pound gross vehicle weight ("GVW") limit established by the State Department of Transportation. The Ombudsman's report specifically called on the County to provide truck weight scales at transfer stations as soon as possible, to confirm the weight of truck trailer combinations leaving the stations.

The Solid Waste Division has indicated to Council staff that in response to the Ombudsman's investigation, the Division pointed out:

- the ongoing upgrade of the transfer station network is expected to eventually result in placement of truck/trailer weighing capacity as part of the loading process, at all transfer facilities. However, this capital project requires the completion of an extensive siting and construction process, which is not expected to be completed for a number of years;
- procedures were put in place in August of 2010 to allow drivers, concerned with possible carrying an overweight load, to use existing outbound customer scales at those stations without equipment that would allow weighing as part of the loading process.

In response to the Ombudsman's report, Council staff was directed to review the report and identify potential Council options. In its review, staff noted the use of portable weight scales by several local agencies, including the County's Roads Division. These scales were described as reliable and reasonably priced.

The Council approved Motion 13323 in September 2010 requiring a report by the Solid Waste Division on the cost, reliability, accuracy and utility of portable scales and weigh-in-motion scales, for use at transfer stations as needed.

Portable Weight Scales Report

On November 9, 2010, the Executive transmitted its Portable Weight Scales Report ("Report"). In that Report, the Division notes that the County is currently implementing the Solid Waste Transfer and Waste Management Plan, adopted by the Council. That Plan is centered on an upgrade of the solid waste transfer station system, which will result in the placement of waste compaction systems that incorporate weighing truck trailer combinations at the time of loading, at each of the transfer stations upon system completion.

Three stations—Shoreline, Enumclaw and Vashon—currently have truck/trailer weighing capability as trailers are loaded. The Houghton transfer station has chute scales in place that have experienced operating difficulties. The Report states that recent repair work has made temporary improvements to the Houghton scales. The four remaining stations—Factoria, Bow Lake, Algona, and Renton—currently do not have the capability to weigh transfer truck/trailers as they are loaded. Current construction of an upgraded station at Bow Lake includes the installation of pre-load compactors. Part of this new equipment will allow for truck/trailers to be weighed as part of the loading process. The Report repeated the Division's position that procedures, in place since August of 2010, allow drivers, concerned with possible overweight loads, to use existing outbound customer scales as an alternative until transfer stations have been upgraded to include the pre-load compactors.

Because the Bow Lake transfer station is expected to be operational in 2012, and the Factoria station is scheduled for renovation, which will require significant changes to vehicle traffic at the site, the Report recommends against installation of portable scale systems at the Bow Lake or Factoria stations.

The Report describes types of portable truck scale systems, including on-board systems, wheel systems, axle systems, truck systems, and weigh-in-motion systems.

The Report identifies costs for scale systems as varying between \$60,000 and \$300,000 for purchase only, with additional costs required, such as an additional \$1,500,000 for upgrading trailer suspension systems, or up to \$1,200,000 to install a semi-fixed axle weighing system. Additional staff for wheel and some axle weighing systems could cost \$700,000 per year, according to the report.

The Report states that space and staff requirements are key considerations in addressing the utility of trailer weighing systems. As the Report asserts, some systems require a significant straight-away section of pavement, which is not available at the transfer stations. Other more manual weighing systems do not require as much space, but require significant additional time and labor.

The Report concludes by noting that several scale systems are not viable options. These include:

- Weigh-in-Motion scale systems, which require a length of straight driving surface that is unavailable at transfer stations
- on board scale systems, which require a costly upgrade of transfer trailer suspensions, and
- wheel and some axle scale systems, which require additional staff and trucks.

Certain axle scale systems may be viable, according to the Report. However, the Report also points out that such systems are not significantly different from customer scales currently in place, and given site constraints, procurement and installation time, and cost, the Report asserts that these axle scale systems do not present any clear advantage over an existing procedure that allows a driver to weigh any load suspected of being over permitted weight.

ANALYSIS

The Solid Waste Division has conducted its review of this issue, as directed by Council motion. Costs and utility of available systems led to a recommendation against acquisition of portable or weigh-in-motion scales. Further communications with the Division have provided information regarding the space and procedural constraints at the transfer stations where portable truck scales might be used, demonstrating the limitations on the use of such scales in those locations.

The Division has experienced revenue constraints in recent years resulting in staff reductions. Additional staffing requirements for some portable scale systems may be impractical at this time. In light of those considerations, it may be most appropriate to monitor the Division's progress in utilizing available procedures to continue to reduce the proportion of truck/trailer combinations leaving transfer stations over weight limits,

while pursuing completion of transfer station upgrades and replacements addressed in the Solid Waste Transfer and Waste Management Plan.

In order to systematically effectuate this monitoring and encourage continuing Division attention to this matter, it may be worthwhile for the Committee to consider requesting inclusion of an update on the proportion of truck/ trailer combinations leaving transfer stations in an overweight condition, in the annual report provided by the Division to the Council in May of each year.

ATTACHMENTS

1. Portable Weight Scales Report—Prepared in Accordance With Motion 13323, dated November 2010

Portable Weight Scales Report

Prepared in accordance with
Motion 13323

November 2010



King County

Department of Natural Resources and Parks
Solid Waste Division

INTRODUCTION

This report has been prepared in response to Motion 13323 passed by the King County Council on September 7, 2010. The motion states:

- A. The solid waste division is directed to undertake a study on the availability of portable weight scales that could be used for weighing trucks that carry solid waste from transfer stations to the Cedar Hills landfill. The study shall address the cost, reliability, accuracy and utility of such scales for that purpose. The study shall also address the potential for surplus scales when station upgrades or replacements are completed. Among the scales considered should be portable scales currently in use by other agencies of county government.
- B. By November 10, 2010, the solid waste division shall file a report, summarizing the results of the study, in the form of a paper original and an electronic copy with the clerk of the council, who shall distribute electronic copies to all council members.

BACKGROUND

The requirement for the report resulted from concern that some tractor/trailer combinations travelling from the transfer stations to the Cedar Hills Regional Landfill may be loaded in excess of the permitted gross vehicle weight limit. When the issue was raised with the division in May 2009, via a complaint to the County Ombudsman, the division recognized the potential problem and worked closely with employees and their union to develop procedures that allow division truck drivers to use the existing outbound customer scales at the transfer stations to weigh the tractor/trailer combinations if an overload is suspected. Drivers are not required to haul any load they believe is unsafe or any load that is over the permitted gross vehicle weight limit.

As a long term solution, the division is implementing the *Solid Waste Transfer and Waste Management Plan* that was approved by the King County Council in December 2007. Pre-load compactors that weigh the waste as it is being loaded into the transfer trailer or container will be included in all new stations as the transfer system is renovated. Four division transfer stations — Algona, Bow Lake, Factoria, and Renton — currently do not have the capability to weigh transfer trailers as they are loaded. The Houghton transfer station has had chute-scales in place since the early 1990s; however, due to operating conditions these scales have been problematic. Recent repair work has made at least temporary improvements, but the system is expected to continue requiring significant on-going maintenance to keep it functioning properly. The division's other, more modern sites — Enumclaw, Shoreline, and Vashon — already operate with pre-load compactors that weigh each load as it is put into a trailer. Construction of the new Bow Lake station, including installation of pre-load compactors, is currently in progress; Bow Lake handles about one-third of the system's tonnage. The procedures in place to weigh trailers using the existing outbound customer scale are an available alternative until transfer stations have been upgraded to include the pre-load compactors.

The County Ombudsman investigated this issue and issued a report dated August 19, 2010. The Ombudsman's report acknowledges that during the course of the investigation, the division increased the overall percentage of tractor/trailer combinations loaded within the permitted

gross vehicle weight limit from 91 percent to 93 percent and that truck drivers interviewed by the Ombudsman's Office now believe that the problem of overloaded trucks has largely been resolved. The report also recognizes the division's excellent safety record.

SUMMARY OF STUDY RESULTS

General Weighing Systems Information

Information about general and specific types of truck weighing scales available in the industry was obtained from scale manufacturers and regional governmental agencies using weighing systems.

In general, truck scale weighing systems are of two broad types – static or dynamic. A static weighing system functions with the vehicle at rest on the scales while a dynamic weighing system functions with the vehicle moving across the scales.

Portable truck scales systems are of the following types:

- On-Board – using the air or hydraulic suspension systems of the tractor and trailer
- Wheel – wheel-pads, each weighing 30 to 50 pounds, are placed and driven onto to weigh each axle alone or in combination
- Axle – platforms are driven onto to weigh each axle alone or in combination
- Truck – platforms are of sufficient length to weigh the tractor and trailer as a unit
- Weigh-In-Motion (WIM) (either slow or highway speed) – platforms are driven across at a steady speed, accumulating each axle weight into a total vehicle weight

Of these, only the WIM type can function as a dynamic weighing system. A slow speed WIM, however, can also operate in a static mode. While the advantage of a dynamic weigh system is maintaining a flow of traffic, static systems are generally accepted as providing the most accurate weight measurement. One manufacturer of a slow speed WIM system represented the weight measurement accuracy with their system as ± 0.5 percent operated in static scale mode and between ± 1 and 2 percent operated in dynamic scale mode (accuracy increases as motion decreases).

Functional Considerations

The new Bow Lake station is under construction and expected to be operational in 2012. The new station includes pre-load compactors that will weigh the waste as it is being loaded. The Factoria station is also scheduled for renovation, which will include significant changes to vehicle traffic at the site. Given the time and cost required, we do not recommend installation of any portable scale system at the Bow Lake or Factoria transfer station.

Cost

The cost of scale systems varies widely, even within the same type of scale. Installation and additional staffing and equipment costs are the more significant aspect of the weighing options available. On-going system maintenance would be an additional cost.

An on-board scale system would cost approximately \$190,000 to purchase and install on the division's fleet. However, such a system would require an upgrade of the division's current

trailer leaf-spring suspension system to air suspension or load cell equipment, which would cost about \$1,500,000.

Purchase of a semi-fixed or low-profile axle weighing system for three sites would cost approximately \$300,000 total. Installation of such a system at Algona, Houghton, and Renton would total approximately \$900,000 to \$1,200,000 beyond the purchase cost and take at least a year to complete from budget request to completed construction. Due to space requirements, these systems may not be feasible within existing sites and would adversely affect operations, including customer service.

Although the lowest cost scale options are wheel and some axle weighing systems, the staff and equipment needs to manage the time and effort to achieve vehicle weighing with these manual systems would be significant. Scales for three sites – Algona, Houghton, and Renton – would cost approximately \$60,000 including all hardware and software to obtain, display, and record data. The additional effort and time it would take to weigh each vehicle would require additional staff and vehicles in order to maintain customer service and hauling requirements. Additional equipment would cost approximately \$280,000, plus on-going maintenance cost, and additional staff would cost approximately \$700,000 per year.

Reliability

All portable weighing systems studied are manufactured for reliable use due to the fact that they have legal-for-trade as well as enforcement applications. Considerations related to reliability or durability with the differing scale systems are the power source, weather/operating environment, and drive surface.

Accuracy

Accuracy of weight measurement with any of the above scale types is sufficient for the purpose of determining overloaded vehicles. A high degree of accuracy is essential to the legal-for-trade (commercial) and enforcement applications for which most weighing systems are manufactured.

Utility

Primary considerations in the use of a portable scale system at the transfer stations are space and staff requirements. Some weighing systems require a significant straight-away section of pavement, which is not available at the division's transfer stations. The WIM system is not a viable weighing solution for the transfer stations due to the operating space requirements. Other, more manual weighing systems do not require as much space, but require significant additional time and labor.

Surplusing

Presuming a 10-year horizon for the replacement of chute stations with pre-load compactor stations, some scale systems would have little remaining useful life or value. Components may have minimal auction value.

CONCLUSION

The driving factors for consideration in a portable scale system are utility and cost. Any of the scale systems reviewed deliver sufficient reliability and accuracy, and surplus value is not likely to be a significant consideration.

Several scale systems are not viable options for the division. These include WIM scale systems, which require a length of straight driving surface that is not available at division stations; on-board scale systems, which would require a costly upgrade of transfer trailer suspensions; and wheel and some axle scale systems, which are manual weighing systems and would require additional staff and trucks. Certain axle type of scale systems, especially the low-profile or in-ground styles, may be viable, but are not significantly different from the customer scales already in place at the transfer stations and given the site constraints, time to procure and install, and cost, they do not present any clear advantage over the procedure, which is already in place, that allows the truck driver to weigh any load that is suspected of being over the permitted gross vehicle weight.

